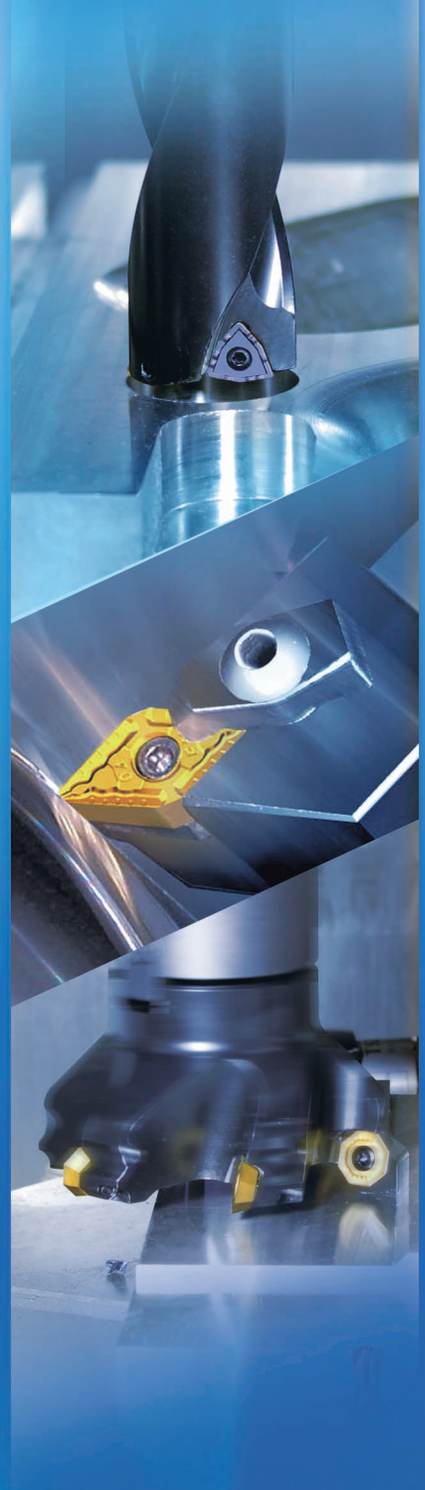
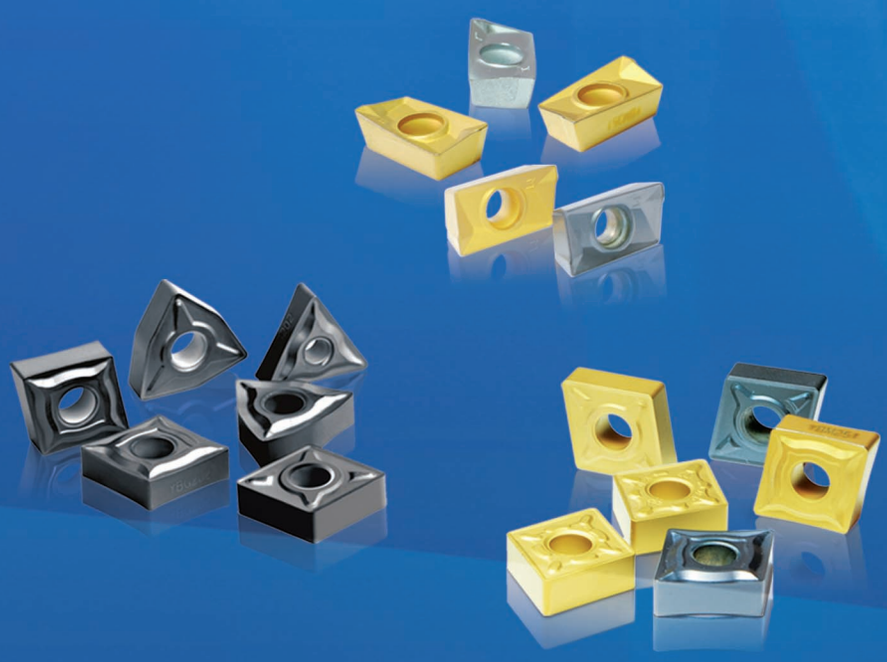
Россия
Trade Technology
Ordzhonikidze ul. d.11, str. 11
115419, Moscow (Russia)
Tel. +7 499 - 650 5031
Fax +7 499 - 650 5031
Web ➤ www.trte.ru

Main Catalogue 2009-2011
Hauptkatalog

ZCC·CT

Turning - Milling - Drilling / Drehen - Fräsen -Bohren





ZhuZhou Cemented Carbide Cutting Tools Co. Ltd
ZCC Group

WELCOME TO ZCC CUTTING TOOLS

ZCC CT, one of the leading carbide tools manufacturer worldwide, is welcoming you.
We are able to offer you a wide range product line of highly qualified cutting tools and a good service to enhance the handling and productivity at your site.
You will find the tools for turning, milling and boring in this catalogue.

We are looking forward to a mutually good cooperation.
Your ZCC CT team is ready to help you.



HERZLICH WILLKOMMEN BEI ZCC CUTTING TOOLS

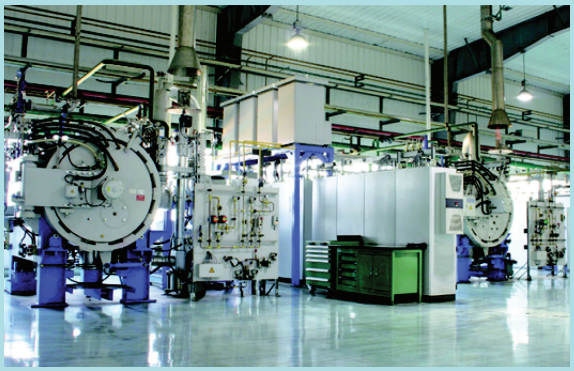
ZCC CT einer der weltweit führenden Hartmetall Werkzeughersteller begrüßt Sie recht herzlich.
Die umfangreiche Produktpalette an Hochleistungs-Zerspanungswerkzeugen und entsprechender Serviceleistung erfüllt die Voraussetzung, bei Ihnen die Bearbeitungssicherheit und Wirtschaftlichkeit zu erhöhen.
Im folgenden finden Sie in unserem Katalog die Werkzeuge für das Drehen, Fräsen und Bohren.
Wir freuen uns, auf Ihre Zusammenarbeit.
Ihr ZCC CT Team steht Ihnen als Partner zur Seite.

OUR EUROPEAN HEADQUARTER/ EUROPA ZENTRALE:
ZCC Cutting Tools GmbH, Heltorfer Str.12, 40472 Düsseldorf
Tel.: 0049 (0) 211/989240-0, Fax: 0049 (0) 211/ 989240-111
E-Mail: info@zccct-europe.com, www.zccct-europe.com, www.zccct.com






WENDT





Content · Inhaltsangabe

A Turning Drehen A1-A310

General Turning Allgemeine Drehbearbeitung	A 1 - A 253
Parting and Grooving Ab- und Einstechen	A 254 - A 290
Thread Turning Gewindedrehen	A 291 - A 323

B Milling Fräsen B1-B290

Milling Indexable Tools Fräsen - WSP· Werkzeuge	B 1 - B 187
Milling - Solid Carbide Endmills Fräsen VHM - Schaftfräser	B 188 - B 374

C Drilling Bohren C1-C147

Drilling - Solid Carbide Drills Bohren - VHM Bohrer	C 6 - C 93
Drilling Indexable Tools Bohren - WSP· Werkzeuge	C 95 - C 105

Reaming Reiben

Reaming Reiben	C 106 - C 116

Threading Gewinde

Threading - Solid Carbide Tools Gewinde - VHM Gewindebohrer	C 118 - C 124
Solid carbide Threading end mills Gewindefräsen - VHM Gewindefräser	C 125 - C 128

D

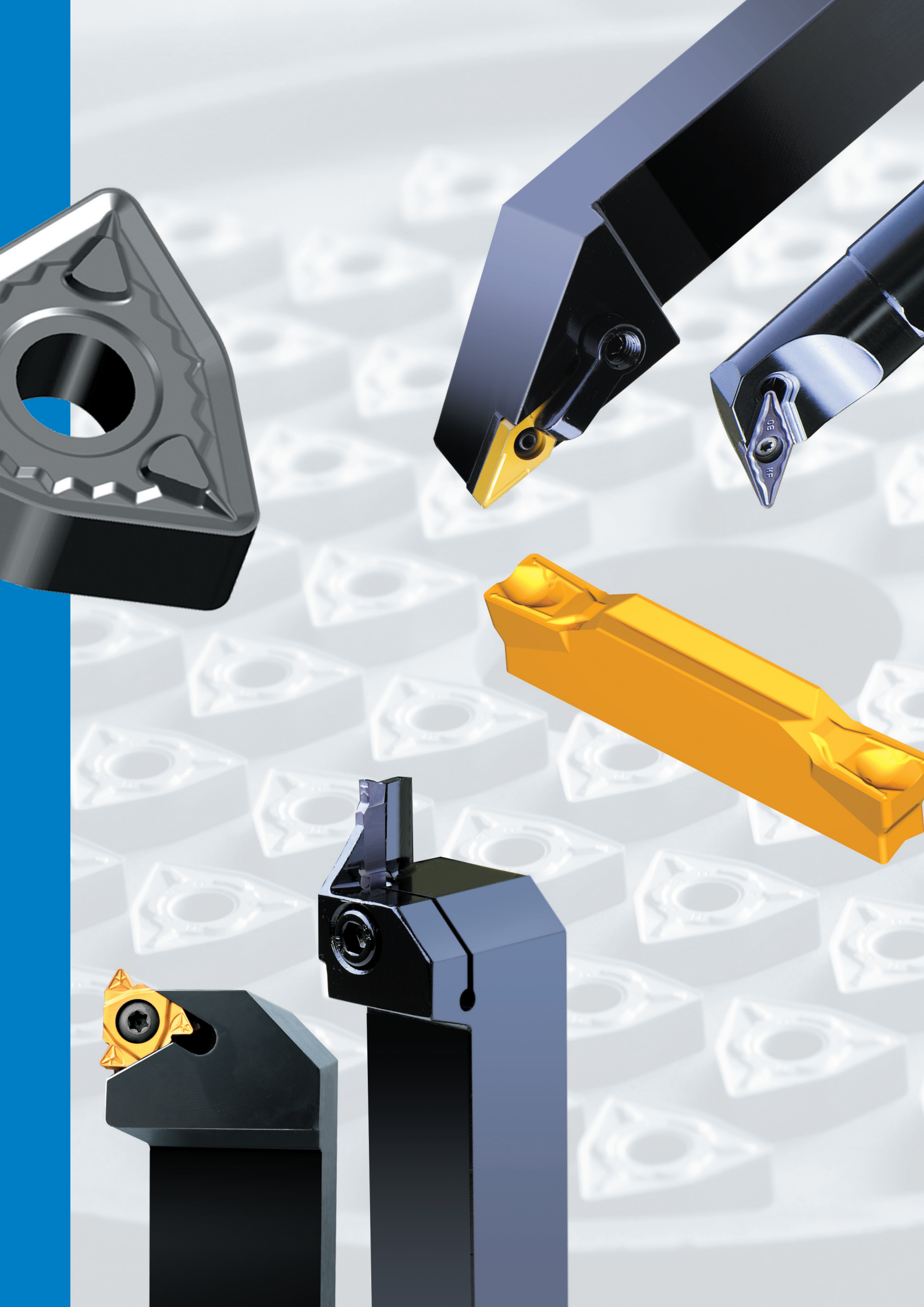
Tooling Systems Werkzeugsysteme	D 1 - D 38

E

General Technical Information Allgemeine Technische Informationen	E 1 - E 20

Index I 01 - I 03

WSP = Wendeschneidplatte *VHM = Vollhartmetall*



Turning · Drehen

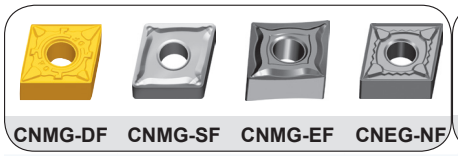
Turning Insert (Overview)	**A4-A9**	**Schneidplatten zum Drehen (Übersicht)**
Turning Tools (Overview)	**A10-A13**	**Halter zum Drehen (Übersicht)**
Recommended Grades for Turning	**A14**	**Empfohlene Sorten für die Drehbearbeitung**
Chip breaker Overview and Describtion	**A16-30**	**Spanbrecher Übersicht und Beschreibung**
Grade Describtion	**A31-40**	**Sortenbeschreibung**
ISO indexable insert code key	**A42-43**	**ISO Kennzeichnung für Schneidplatten**
Application instruction of general turning	**A44-A45**	**Allgemeine Anwendungsempfehlung (Drehen)**
ISO Turning Inserts	**A46-A146**	**ISO Wendeschneidplatten zum Drehen**
Carbide and Cermet Inserts	A46-A112	Hartmetall und Cermet WSP
PCBN & PCD Inserts	A113-A135	PCBN & PKD Wendeschneidplatten
Ceramic Insert	A136-A146	Keramik Wendeschneidplatten
Turning Tool Holder	**A147-A253**	**Drehwerkzeuge**
External Turning Tools	A147-A210	Halter für **Außenbearbeitung**
Internal Turning Tools	A211-A248	Halter für **Innenbearbeitung**
Recommended cutting parameters	A249-A253	Empfohlene Schnittdaten (Drehen)
Parting, Grooving Tools	**A254-A290**	**Ab- und Einstech-Werkzeuge**
Parting, Grooving Tool (Overview)	A255-A259	Ab- und Einstechen (Übersicht)
ISO Parting, Grooving insert code key	**A260**	**ISO Kennzeichnung für Stechplatten**
Parting, Grooving Inserts	A261-A268	WSP zum Ab- und Einstechen
Parting, Grooving Holder	A269-A288	Halter zum Ab- und Einstechen
Parting, Grooving Cutting Condition	A289-A290	Ab- und Einstechen Schnittdatenempfehlung
Threading Tools	**A291-A316**	**Gewindedreh-Werkzeuge**
Threading Tools (Overview)	A292-A294	Klemmhalter zum Gewindedrehen (Übersicht)
ISO Threading inserts code key	**A295**	**ISO Kennzeichnung für Gewindeplatten**
Threading Inserts	A296-A302	Gewindedrehplatten
ISO tools code key	A303	ISO Kennzeichnung für Gewindehalter
Threading Cutting Conditions	A304-A305	Gewindedrehen Schnittdatenempfehlung
Recommend Cutting datas	A306-A316	Empfohlene Schnittdaten (Gewindebearb.)
General Technical Info. for Turning	**A317-323**	**Allgemeine Technische Info. zum Drehen**

A

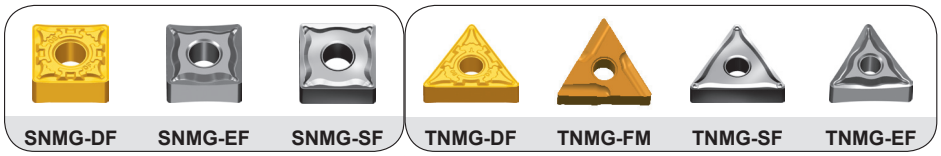
Double Side Negative Inserts
Doppelseitige negative Platten

Carbide and Cermet Inserts - Hartmetall- und Cermet-WSP

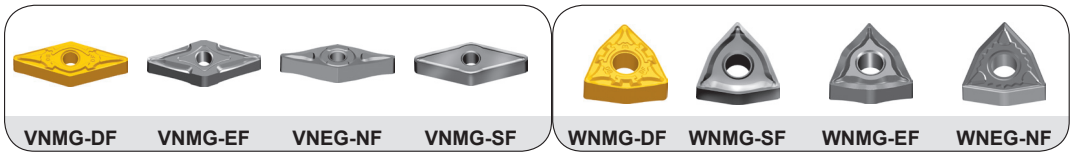
Finishing · Schlichten



CNMG-DF	CNMG-SF	CNMG-EF	CNEG-NF	DNMG-DF	DNMG-FM	DNMG-SF	DNMG-EF	DNEG-NF	
09,12	09,12	09,12	12	11,15	15	11,15	11,15	15	Edge length · Kantenlänge
A46	A46	A46	A47	A53	A54	A53	A54	A54	Page · Seite

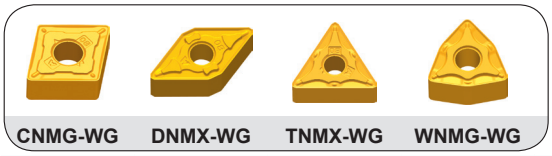


SNMG-DF	SNMG-EF	SNMG-SF	TNMG-DF	TNMG-FM	TNMG-SF	TNMG-EF	
09,12	09,12,15	09,12,15	16,22	16	11,16,22	11,16,22	Edge length · Kantenlänge
A59	A59	A60	A68	A69	A68	A68	Page · Seite



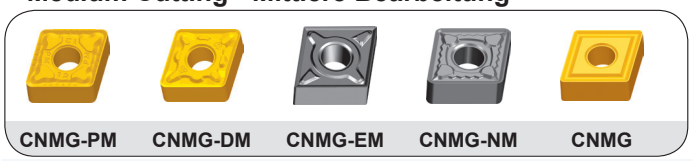
VNMG-DF	VNMG-EF	VNEG-NF	VNMG-SF	WNMG-DF	WNMG-SF	WNMG-EF	WNEG-NF	
16	16	16	16	06,08	06,08	06,08	08	Edge length · Kantenlänge
A74	A74	A74	A74	A76	A77	A77	A77	Page · Seite

Wiper

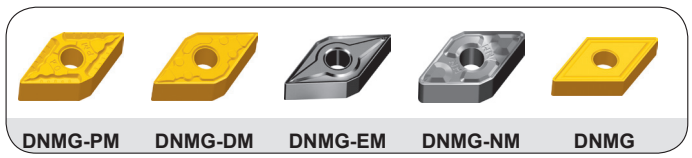


CNMG-WG	DNMX-WG	TNMX-WG	WNMG-WG	
12,16	11,15	16	06,08	Edge length · Kantenlänge
A46	A53	A68	A76	Page · Seite

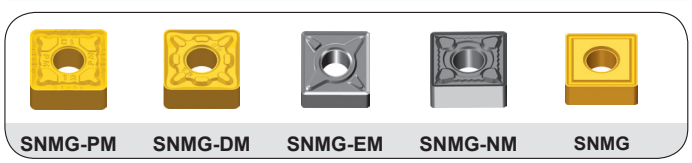
Medium Cutting · Mittlere Bearbeitung



CNMG-PM	CNMG-DM	CNMG-EM	CNMG-NM	CNMG	
09,12,16,19	09,12,16,19	12,16	12	12,16,19	Edge length · Kantenlänge
A47	A48	A48	A49	A51	Page · Seite



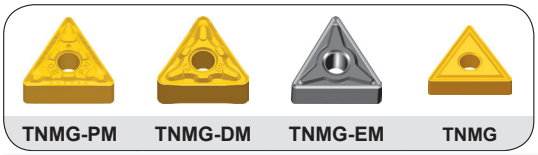
DNMG-PM	DNMG-DM	DNMG-EM	DNMG-NM	DNMG	
11,15	11,15	11,15	15	15,19	Edge length · Kantenlänge
A54-A55	A55	A56	A56	A58	Page · Seite



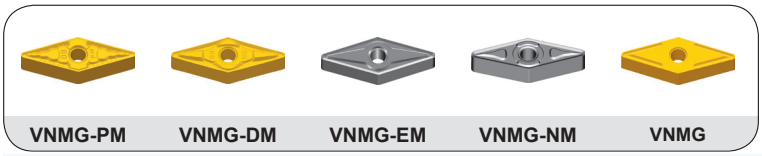
SNMG-PM	SNMG-DM	SNMG-EM	SNMG-NM	SNMG	
09,12,15,19	09,12,15,19	12,15	12	09,12,15,19,25	Edge length · Kantenlänge
A60	A61	A61	A62	A65	Page · Seite

Double Side Negative Inserts
Doppelseitige negative Platten

Medium Cutting · Mittlere Bearbeitung



TNMG-PM	TNMG-DM	TNMG-EM	TNMG	
11,16,22	11,16,22	16,22	11,16,22,27,33	Edge length · Kantenlänge
A69	A69	A70	A72	Page · Seite

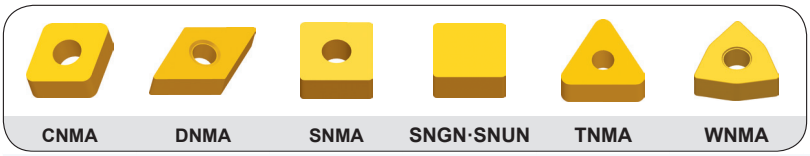


VNMG-PM	VNMG-DM	VNMG-EM	VNMG-NM	VNMG	
16	16	16	16	16	Edge length · Kantenlänge
A75	A75	A75	A75	A75	Page · Seite



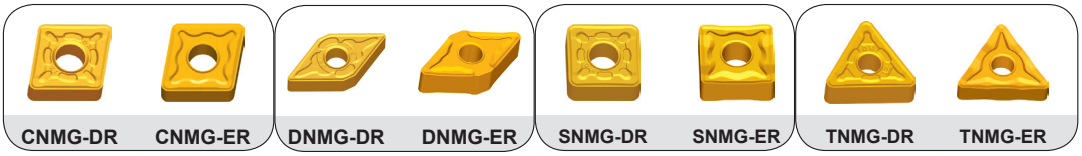
WNMG-PM	WNMG-DM	WNMG-EM	WNMG-NM	RNMG	
06,08	06,08	06,08	08	12	Edge length · Kantenlänge
A78	A78	A78	A79	A80	Page · Seite

Medium to Rough Cutting · Mittlere bis Schruppbearbeitung



CNMA	DNMA	SNMA	SNGN·SNUN	TNMA	WNMA	
12,16,19	11,15	09,12,15,19	09,12,15,19,25	16,22,27	06,08	Edge length · Kantenlänge
A51	A57	A66	A67	A73	A79	Page · Seite

Roughing · Schruppen



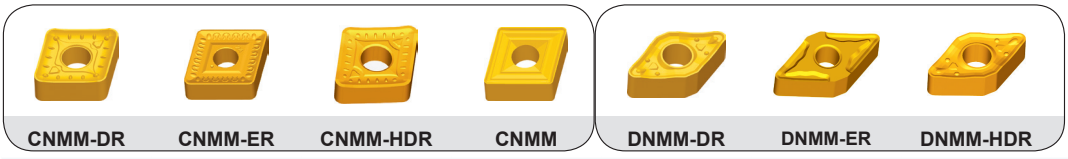
CNMG-DR	CNMG-ER	DNMG-DR	DNMG-ER	SNMG-DR	SNMG-ER	TNMG-DR	TNMG-ER	
12,16,19	12,16,19	15	15	12,15,19	12,15,19	16,22,27	16,22	Edge length · Kantenlänge
A49	A50	A56	A58	A62	A63	A70	A71	Page · Seite



WNMG-DR	
06,08	Edge length · Kantenlänge
A79	Page · Seite

Single Side Negative Inserts
Einseitige Negative Platten

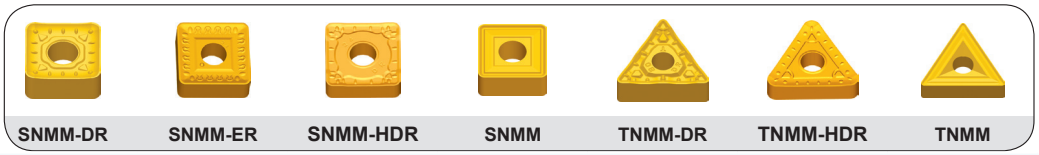
Roughing · Schruppen



CNMM-DR	CNMM-ER	CNMM-HDR	CNMM	DNMM-DR	DNMM-ER	DNMM-HDR	
12,16,19,25	25	12,16,19	12,19	15	15	15	Edge length · Kantenlänge
A50	A50	A50	A52	A58	A58	A58	Page · Seite

Single Side Negative Inserts · Einseitige Negative Platten

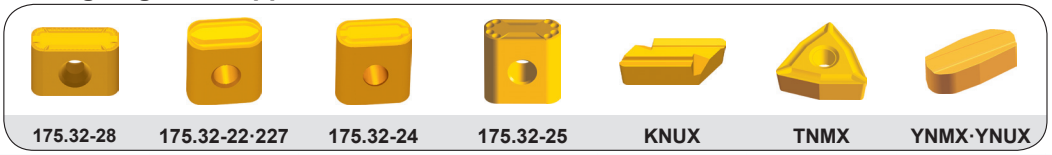
Roughing · Schruppen



SNMM-DR	SNMM-ER	SNMM-HDR	SNMM	TNMM-DR	TNMM-HDR	TNMM	
12,15,19,25	25	12,15,19,25	09,12,19,25	16,22,27	16,22,27	16,22,27	Edge length · Kantelänge
A62-A63	A63	A64	A65-66	A71	A72	A73	Page · Seite

Special Inserts · Spezielle Drehplatten

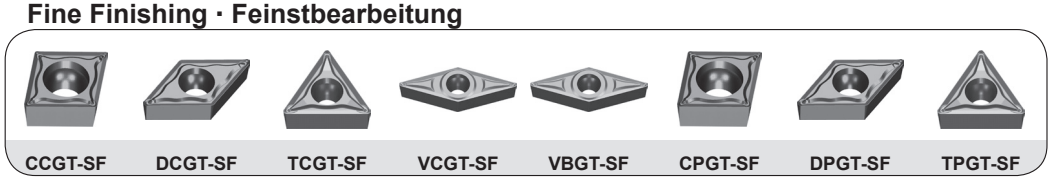
Roughing · Schruppen



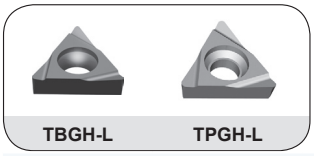
175.32-28	175.32-22·227	175.32-24	175.32-25	KNUX	TNMX	YNMX·YNUX	
19	19	19,30	19	16	11,15	18,25	Edge length · Kantelänge
A82	A82	A82	A82	A81	A83	A83	Page · Seite

Single Side Positive Inserts · Einseitige positive Wendeschneidplatten

Fine Finishing · Feinstbearbeitung

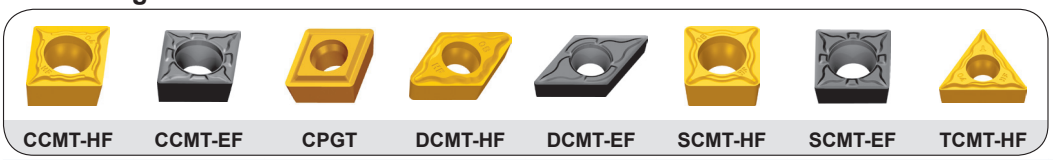


CCGT-SF	DCGT-SF	TCGT-SF	VCGT-SF	VBGT-SF	CPGT-SF	DPGT-SF	TPGT-SF	
06,09	07,11	06,09,11	11,16	11	06,09	07,11	09,11	Edge length · Kantelänge
A84	A88	A98	A106	A108	A87	A91	A103	Page · Seite

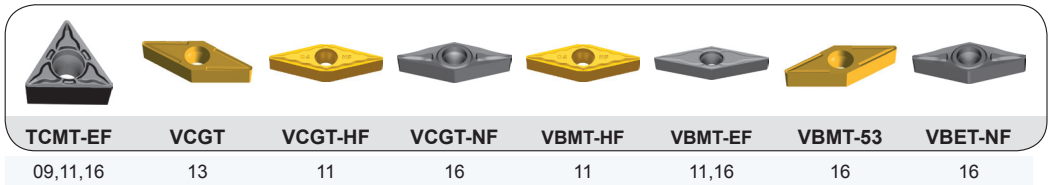


TBGH-L	TPGH-L							
06	09,11							Edge length · Kantelänge
A97	A103							Page · Seite

Finishing · Schlichten

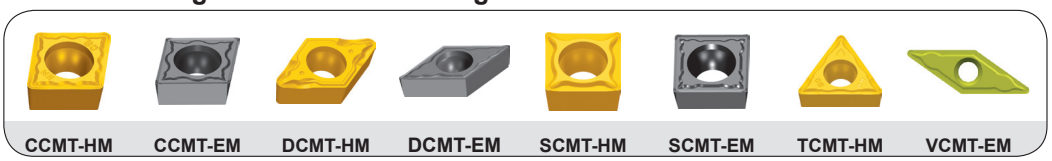


CCMT-HF	CCMT-EF	CPGT	DCMT-HF	DCMT-EF	SCMT-HF	SCMT-EF	TCMT-HF	
06,09,12	06,09,12	05	07,11	07,11	09	09	06,09,11,16	Edge length · Kantelänge
A84	A85	A84	A88	A89	A94	A94	A99	Page · Seite



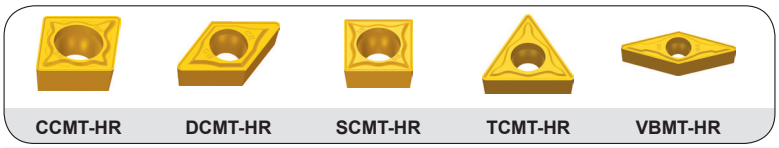
TCMT-EF	VCGT	VCGT-HF	VCGT-NF	VBMT-HF	VBMT-EF	VBMT-53	VBET-NF	
09,11,16	13	11	16	11	11,16	16	16	Edge length · Kantelänge
A100	A106	A106	A106	A108	A108	A108	A108	Page · Seite

Medium Cutting · Mittlere Bearbeitung



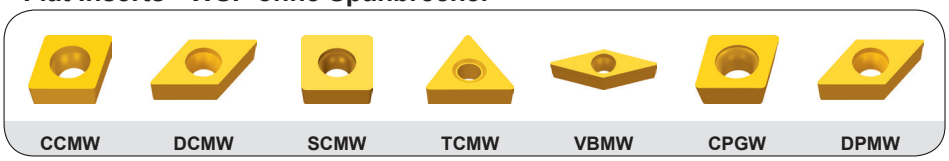
CCMT-HM	CCMT-EM	DCMT-HM	DCMT-EM	SCMT-HM	SCMT-EM	TCMT-HM	VCMT-EM	
06,09,12	06,09,12	07,11	07, 11	09,12	09,12	09,11,16	16	Edge length · Kantelänge
A85	A85	A89	A89	A94	A94	A101	A110	Page · Seite

Roughing · Schruppen

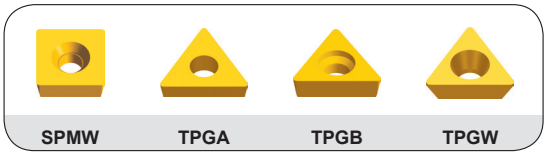


CCMT-HR	DCMT-HR	SCMT-HR	TCMT-HR	VBMT-HR	
06,09,12	11	09,12	09,11,16,22	16	Edge length · Kantenlänge
A86	A90	A95	A101	A109	Page · Seite

Flat Inserts · WSP ohne Spanbrecher

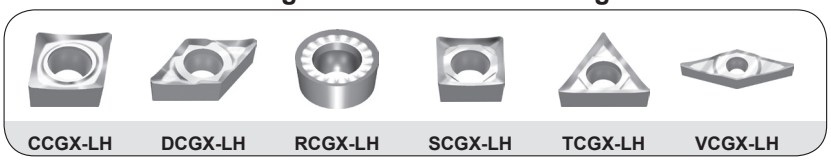


CCMW	DCMW	SCMW	TCMW	VBMW	CPGW	DPMW	
06,09,12	07,11	06,09,12	11,16,22	16	06	11	Edge length · Kantenlänge
A86	A90	A95	A102	A109	A87	A91	Page · Seite



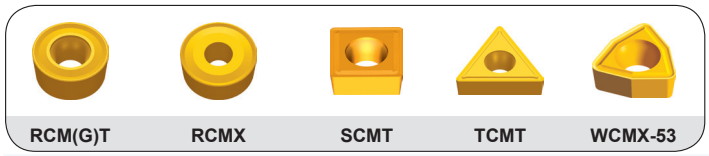
SPMW	TPGA	TPGB	TPGW	
09,12	09,11,16	09,27	09,11,16,22	Edge length · Kantenlänge
A96	A104	A105	A105	Page · Seite

Aluminium machining · Aluminiumbearbeitung



CCGX-LH	DCGX-LH	RCGX-LH	SCGX-LH	TCGX-LH	VCGX-LH	
06,09,12	07,11	08	09,12	09,11,16	11,16,22	Edge length · Kantenlänge
A86	A90	A92	A95	A101	A107	Page · Seite

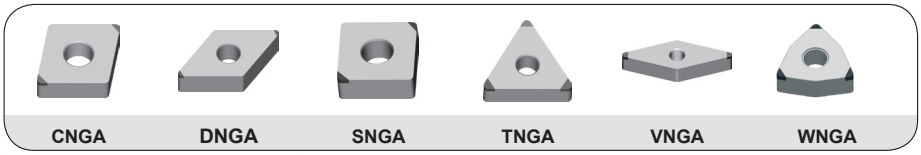
Special Inserts · Spezielle Wendeschneidplatten



RCM(G)T	RCMX	SCMT	TCMT	WCMX-53	
08,10,12,16,19	08,10,12,16,20,25,32	09,12	22	04,06,08	Edge length · Kantenlänge
A92	A93	A95	A102	A111	Page · Seite

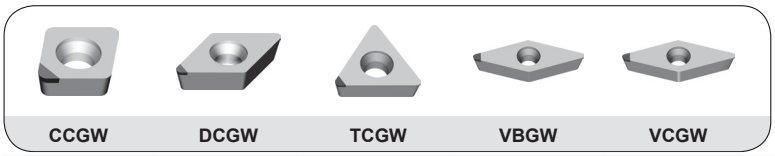
PCBN & PCD

Negative Inserts Negative WSP

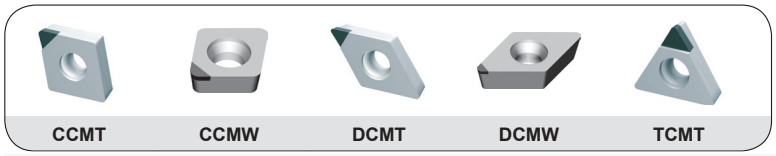


CNGA	DNGA	SNGA	TNGA	VNGA	WNGA	
12	15	12	16	16	08 16	Edge length · Kantelänge
A118	A119	A120	A121	A122	A122	Page · Seite

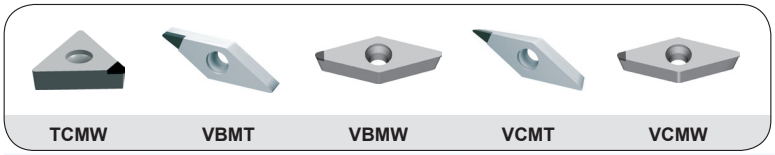
Positive Inserts Positive WSP



CCGW	DCGW	TCGW	VBGW	VCGW	
06,09,12	07,11	11,16	16	16	Edge length · Kantelänge
A123	A124	A125	A126	A126	Page · Seite



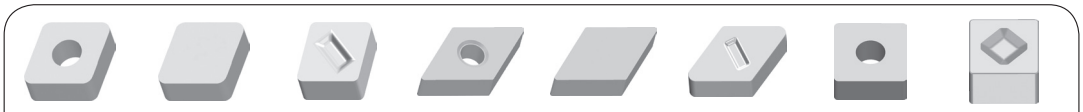
CCMT	CCMW	DCMT	DCMW	TCMT	
06,09,12	06,09,12	07,11	07,11	11,16	Edge length · Kantelänge
A127	A128	A129	A130	A131	Page · Seite



TCMW	VBMT	VBMW	VCMT	VCMW	
11,16	16	16	16	16	Edge length · Kantelänge
A132	A133	A133	A134	A134	Page · Seite

Ceramic Inserts · Keramik Wendeschneidplatten

Negative Inserts Negative WSP



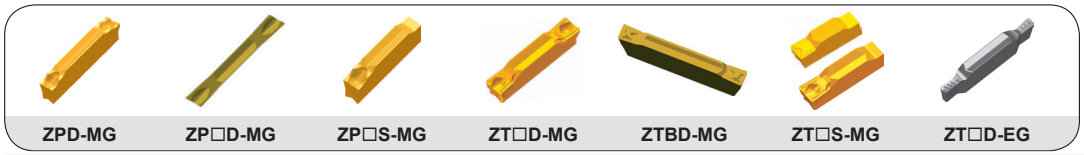
CNGA	CNGN	CNGX	DNGA	DNGN	DNGX	SNGA	SNGX	
12,16	12,16	12	15	15	15	12	12	Edge length · Kantelänge
A138	A139	A140	A140	A141	A141	A142	A142	Page · Seite



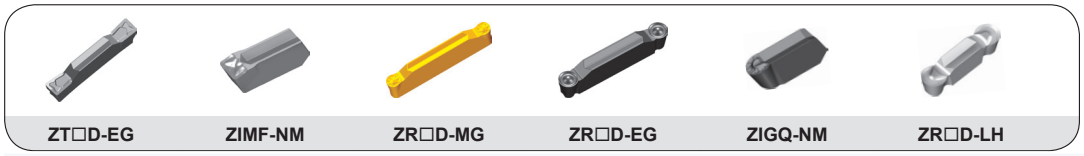
SNGN	TNGA	TNGN	WNGA	RNGN	
09,12,15,19,25	16,22	16,22	08	09,12,15,19,25	Edge length · Kantelänge
A143	A144	A145	A146	A146	Page · Seite

Parting and grooving · Ab- und Einstechen

Little Squirrel Series · zusätzliche Wendeschneidplatten



ZPD-MG	ZP□D-MG	ZP□S-MG	ZT□D-MG	ZTBD-MG	ZT□S-MG	ZT□D-EG	
2.5,3,4,5,6	2.5,3	2.5,3,4,5,6	2.5,3,4,5,6	2	5,6	1-2.4	Width · Breite
A261	A262	A261	A263	A262	A263	A263	Page · Seite



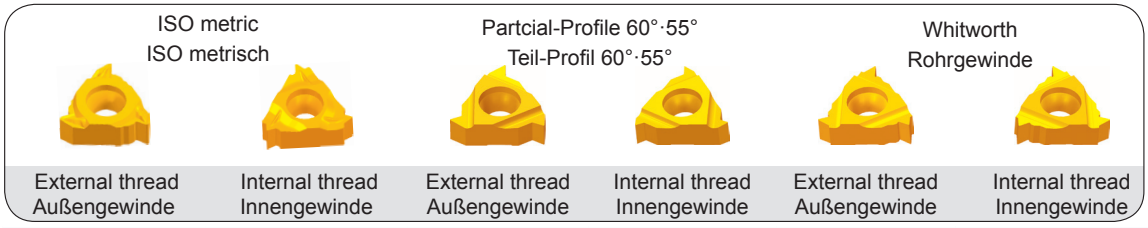
ZT□D-EG	ZIMF-NM	ZR□D-MG	ZR□D-EG	ZIGQ-NM	ZR□D-LH	
2.4-6.5	3,4,5,6	2.5,3,4,5,6	3,4,5,6	3,4,5,6	6,8	Width · Breite
A263	A265	A264	A264	A266	A266	Page · Seite

Complementary Inserts · ergänzende Stechplatten

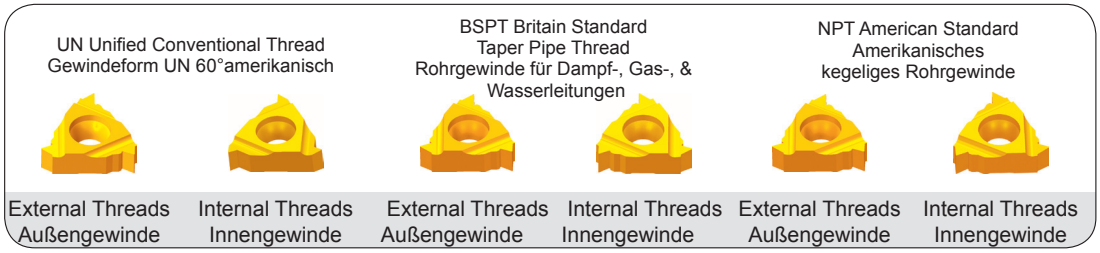


154.3	ZQMX-1E	ZSM□R/L	
1.1,1.3,1.6,1.85,2.15,3.15	3.125,4.125,5.125,6.4,7.05	1.1,1.3,1.6,1.85,2.15,2.65,5,5.15	Width · Breite
A267	A267	A268	Page · Seite

Threading Insert · Gewindeplatten



ISO metric ISO metrisch		Partcial-Profile 60°·55° Teil-Profil 60°·55°		Whitworth Rohrgewinde		
External thread Außengewinde	Internal thread Innengewinde	External thread Außengewinde	Internal thread Innengewinde	External thread Außengewinde	Internal thread Innengewinde	
1~6	1~6	0.5~5	0.5~5	8~16	8~16	Pitch· Steigung
A296	A297	A298	A298	A299	A299	Page· Seite



UN Unified Conventional Thread Gewindeform UN 60°amerikanisch		BSPT Britain Standard Taper Pipe Thread Rohrgewinde für Dampf-, Gas-, & Wasserleitungen		NPT American Standard Amerikanisches kegeliges Rohrgewinde		
External Threads Außengewinde	Internal Threads Innengewinde	External Threads Außengewinde	Internal Threads Innengewinde	External Threads Außengewinde	Internal Threads Innengewinde	
8~20	8~20	11~28	11~28	8~27	8~27	Pitch· Steigung
A300	A300	A301	A301	A302	A302	Page· Seite

Illustration Shows the right hand type· Die Illustration zeigt die Rechtsausführung.

External Turning Holder · Halter zur Außenbearbeitung

P-type Clamping (lever) · P Halter (Kniehebel)

	PCBNR/L	PCLNR/L	PDJNR/L	PDNNR/L	PSBNR/L	PSDNN	PSKNR/L
Angle · Winkel	75°	95°	93°	63°	75°	45°	75°
Page · Seite	A158	A159	A160	A161	A162	A163	A164

	PSSNR/L	PTFNR/L	PTTNR/L	PTGNR/L	PWLNR/L
Angle · Winkel	45°	90°	60°	90°	95°
Page · Seite	A165	A166	A167	A168	A169

M-type Clamping (clamping finger) · M Halter (Pratze)

	MCBNR/L	MCLNR/L	MDJNR/L	MDPNN	MSBNR/L	MSRNR/L	MSKNR/L
Angle · Winkel	75°	95°	93°	62°30'	75°	75°	75°
Page · Seite	A170	A171	A172	A173	A174	A175	A176

	MSDNN	MTGNR/L	MTJNR/L	MTFNR/L	MVVNN	MVJNR/L	MWLNR/L
Angle · Winkel	45°	90°	93°	90°	72°30'	93°	95°
Page · Seite	A177	A178	A179	A180	A181	A182	A183

	MRGNR/L	MRDNN
Angle · Winkel		
Page · Seite	A184	A184

S-type Clamping (screw) · S Halter (Schraube)

	SCACR/L	SCLCR/L	SDACR/L	SDJCR/L	SDNCN	SVJBR/L	SVABR/L
Angle · Winkel	90°	95°	90°	93°	62°30'	93°	90°
Page · Seite	A185	A186	A187	A188	A189	A190	A191

	SVVBN	SVVCN	SVJCR/L	SSBCR/L	SSDCN	SSKCR/L	SSSCR/L
Angle · Winkel	72°30'	72°30'	93°	75°	45°	75°	45°
Page · Seite	A192	A193	A194	A195	A195	A196	A196



S-type Clamping (screw) · S Halter (Schraube)

	STACR/L	STFCR/L	STGCR/L	STTCR/L	SWACR/L	SRDCN	SRGCR/L
Angle· Winkel	**90°**	**91°**	**91°**	**60°**	**90°**		
Page· Seite	A197	A197	A198	A199	A200	A201	A202

C-type Clamping (clamping finger) · M Halter (Pratze)

	CKJNR/L	CKNNR/L
Angle· Winkel	**93°**	**63°**
Page· Seite	A203	A203

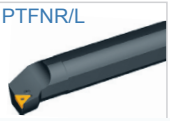
Tool holder for ceramic inserts · Halter für Keramikplatten

	CCLNR/L	CTJNR/L	CTUNR/L	CDJNR/L	CSRNR/L	CSKNR/L	CSDNN
Angle· Winkel	**95°**	**93°**	**93°**	**93°**	**75°**	**75°**	**45°**
Page· Seite	A204	A204	A205	A205	A206	A206	A207

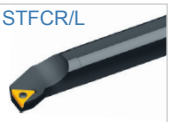
	CRDNN	JCLNR/L	JDJNR/L	JSDNN
Angle· Winkel	**45°**	**95°**	**93°**	**45°**
Page· Seite	A207	A208	A208	A209

Tool holder for Interal Machining · Halter zur Innenbearbeitung

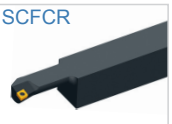
P-type Clamping (lever) · P Halter (Kniehebel)

PCLNR/L	PDSNR/L	PDUNR/L	PSKNR/L	PTFNR/L	PWLNR/L
					
Angle· Winkel **95°**	**62°30'**	**93°**	**75°**	**90°**	**95°**
Page· Seite A216	A218	A219	A221	A222	A223

S-type Clamping (screw) · S Halter (Schraube)

SCLCR/L	SDQCR/L	SDUCR/L	SDZCR/L	SSKCR/L	STFCR/L	SVQCR/L
						
Angle· Winkel **95°**	**107°30'**	**93°**	**85°**	**75°**	**90°**	**107°30**
Page· Seite A224	A226	A227	A228	A229	A230	A231

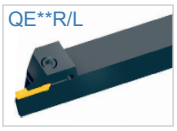
SVUCR/L	SVQBR/L	SVUBR/L	SCLPR/L	SDQPR/L	SDUPR/L	STUPR/L
						
Angle· Winkel **93°**	**107°30'**	**93°**	**95°**	**107°30'**	**93°**	**93°**
Page· Seite A232	A233	A234	A235	A236	A237	A238

SCFCR	SCLCR
	
Angle· Winkel **90°**	**95°**
Page· Seite A239	A240

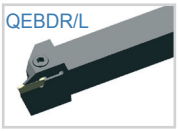
Carbide boring bars · Hartmetallbohrstangen

SCLPR/L	SDQPR/L	SDUPR/L	STUPR/L	SVQCR/L	SVUCR/L
					
Angle· Winkel **95°**	**107°30'**	**93°**	**93°**	**107°30'**	**93°**
Page· Seite A242	A243	A244	A245	A247	A248

Tool Holder for Parting & Grooving · Halter zum Ab- und Einstechen



A272



A271



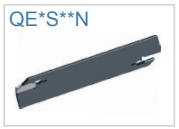
A273



A273



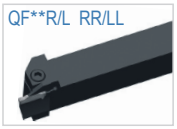
A274



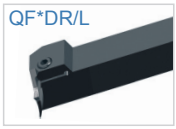
A275



A275



A278-A281



A282-A283



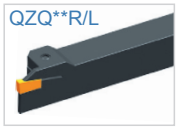
A284



A271



A284



A286



A287



A287



A288

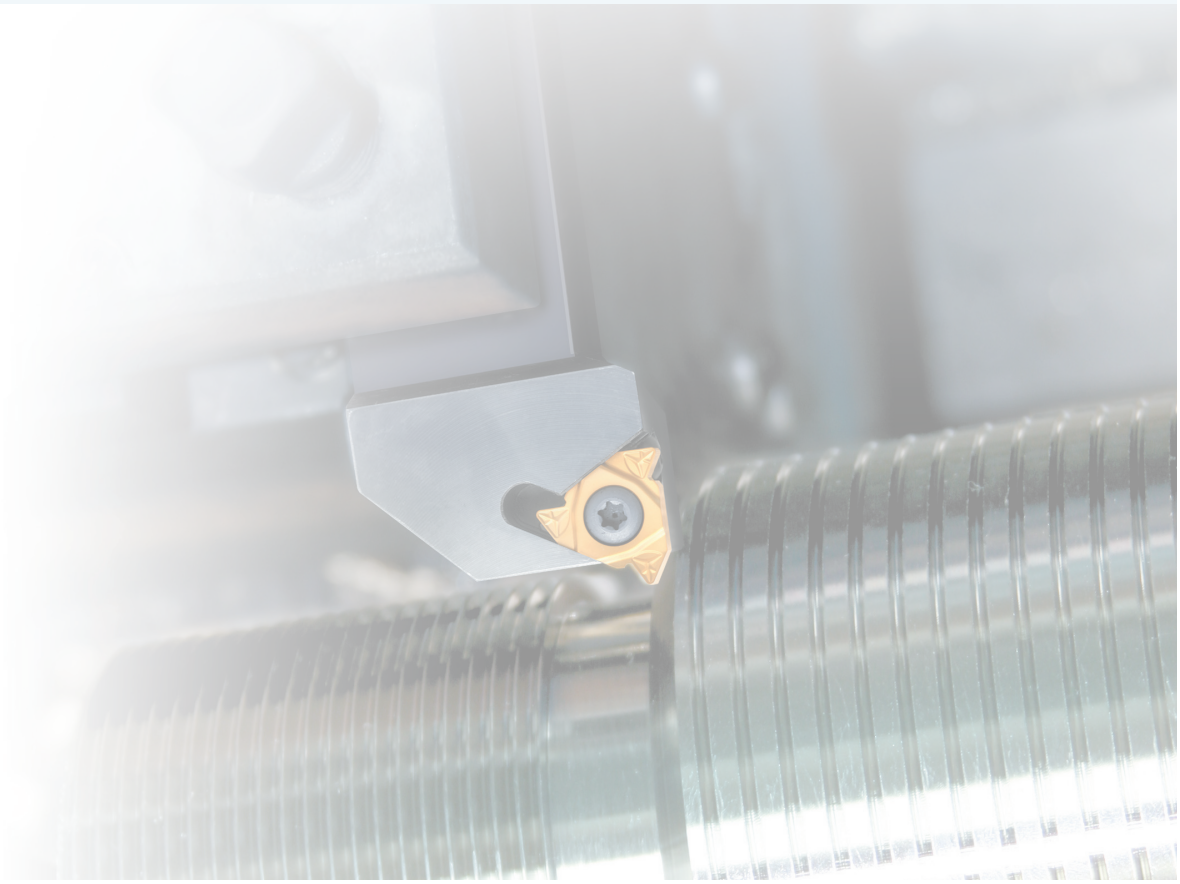
Tool Holder for Threading · Halter für Gewindebearbeitung



A304

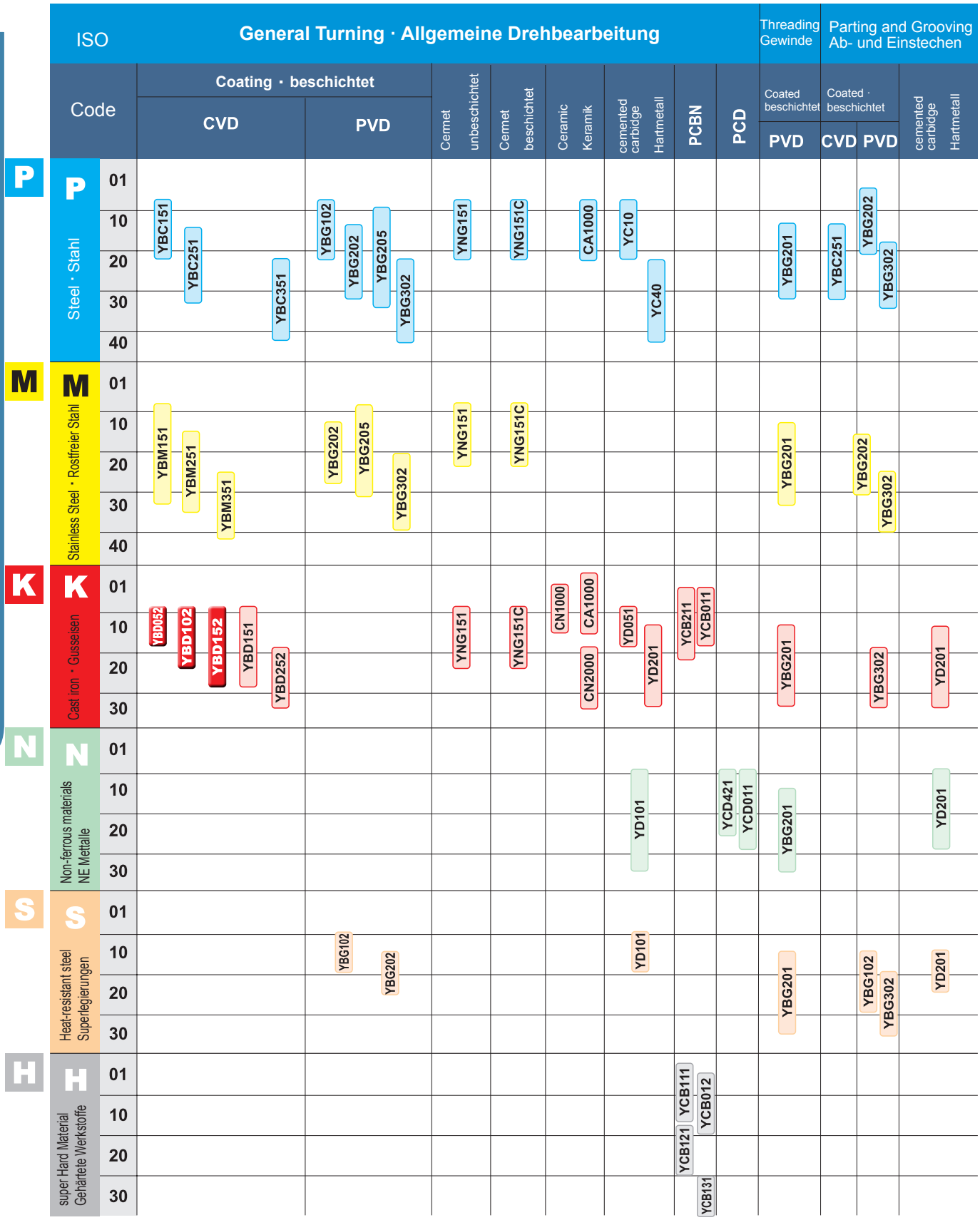


A305



Turning · Drehen

Recommended Grade Overview (Inserts) · Empfohlene Sorten Übersicht (WSP)



General Turning Inserts · Allgemeine Drehschneidplatten

A16 - A23	ISO Turning Inserts Chip breaker Description ISO WSP Spanbrecherbeschreibung
A24-A30	ISO Turning Chip breaker application Guide ISO Spanbrecher nach Anwendungsbereichen
A31-A40	ISO Turning Grades application Guide ISO Sorten nach Anwendungsbereichen
A41-A146	**ISO Turning Inserts** **ISO Wendeschneidplatten**
A42-A43	ISO indexable inserts code key ISO Kennzeichnung für Schneidplatten
A44-A45	Metric and Britain System Comparison List Of General Turning Insert Vergleich Metrisch-Britisch WSP Code
A46-A112	**Carbide, Cermet Inserts** **Hartmetall, Cermet WSP**
A46-A83	Negative Inserts Carbide and Ceramic Negative Wendeschneidplatten Hartmetall und Keramik
A84-A112	Positive Inserts Carbide and Ceramic Positive Wendeschneidplatten Hartmetall und Keramik
A113-A134	**PCBN & PCD Insert Identification Table** **PCBN & PKD Schneidplattenbezeichnung**
A114-A115	PCBN & PCD ISO inserts code key PCBN & PKD ISO Kennzeichnung für Schneidplatten
A116-A117	PCBN & PCD Insert Specificaiton List PCBN & PKD Zuordnungsübersicht
A118-A134	Negative and Positive Inserts PCBN & PCD Negative und Positive Wendeschneidplatten PCBN & PKD
A135	PCBN Grade Trouble Shooting PCBN Sorten Problembehebung
A136-A137	**Ceramic ISO inserts code key** **Keramik ISO Kennzeichnung für Schneidplatten**
A138-A146	Ceramic Inserts Keramik Wendeschneidplatten

Chip breaker Overview · Spanbrecher Übersicht

Negative Inserts
Negative Wendeschneidplatten

NEU

P M K
ap·d.o.c. =0.05~1,5(mm)
f=0.05~0.35(mm/r)

NEW



SF



Special chip breaker in combination with cermets grades. Sharp cutting edge with excellent chip control at small depth of cut and small feed rate. Enable high surface finishing.

Spezieller Spanbrecher in Kombination mit Cermetsorten. Mit scharfer Schneide für exzellenten Spanbruch bei kleinen Schnitttiefen und Vorschüben und sehr guter Oberflächengüte.

P M
ap·d.o.c. =0.3~2,5 (mm)
f=0.05~0.35(mm/r)



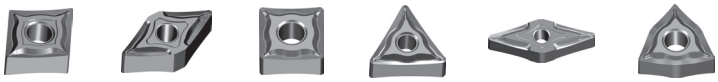
DF



Chip breaker for finishing and semi-finishing of steel and stainless steel.

Spanbrecher für die Schlicht- bis mittlere Bearbeitung von Stahl und rostfreiem Stahl.

M S
ap·d.o.c. =0.05~2,5(mm)
f=0.05~0.3 (mm/r)



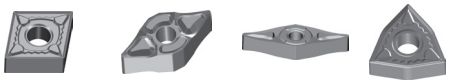
EF



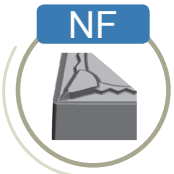
Sharp, positive cutting edge for finishing and semi-finishing of austenitic stainless steel, soft steel, low carbon steel and heat resistant super alloy. Suitable for continuous to light interrupted cut.

Sehr scharfe und positive Schneidkante für die Schlicht- bis mittlere Bearbeitung von austenitschem, rostfreien Stahl, weichem Baustahl und Stahl mit niedrigem Kohlenstoffgehalt und warmfesten Superlegierungen.

S M
ap· d.o.c. =0.1~1,5(mm)
f=0.05~0.3(mm/r)



NF



Ground inserts with sharp and positive cutting edge. NF with grade YBG102 is best combination for finishing of heat resistant super alloys (Ni-based, Fe-based and Co-based alloys) Vc=40-100m/min

Geschliffene Wendeschneidplatte mit einer scharfen, positiven Schneidkante. NF in Kombination mit der Sorte YBG102 ist die beste Lösung für die Schlichtbearbeitung von warmfesten Superlegierungen und exotischen Materialien (Ni-basiert, Fe-basiert, Co-basiert) Vc=40-100m/min

Chip breaker Overview · Spanbrecher Übersicht

Wiper

WG



P M K

ap· d.o.c. =0.3~2(mm)
f= 0.1~0.4(mm/r)



Excellent surface finishing and high feed rate due to wiper technology. For finishing and semi-finishing of steel, stainless steel or cast iron.

Exzellente Oberflächengüte und hohe Vorschübe durch Wipertechnologie. Geeignet zum Schlichten bis mittlere Bearbeitung von Stahl, rostfreiem Stahl und Guss.

Mittlere Bearbeitung · Semi-Finishing

DM



P M

ap· d.o.c. =1.5~5(mm)
f= 0.15~0.5(mm/r)



Main chip breaker for medium machining with continuous or interrupted cut of steel and stainless steel.

Hauptspanbrecher für die mittlere Bearbeitung mit und ohne Schnittunterbrechung von Stahl und rostfreiem Stahl.

PM



P K

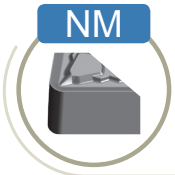
ap· d.o.c. =1.5~5(mm)
f= 0.15~0.5(mm/r)



Unisversal chip breaker with stable cutting edge. Suitable for medium machining also with interrupted cut especially for cast iron and steel.

Universelle Spanbrecherform mit stabiler Schneidkante. Besonders geeignet für die mittlere Bearbeitung von Guss und Stahl auch mit Schnittunterbrechung.

NM



S M

ap· d.o.c. = 1.5~5(mm)
f= 0.15~0.5(mm/r)



Sharp cutting edge with positive multi-rakes. Special for the semifinishing of heat resistant super alloys.

Scharfe Schneidkante mit positivem Multi-Spanwinkel. Besonders geeignet für die Bearbeitung von warmfesten Superlegierungen.

EM



M P S

ap· d.o.c. =0.5~4.0(mm)
f=0.1~0.5(mm/r)



Sharp and stable cutting edge for semifinishing of adhesive material and austenitic stainless steel. Suitable also for interrupted cut.

Spanbrecher mit scharfer, stabiler Scheidkante für die mittlere Bearbeitung von adhäsiven Materialien und austenitischem rostfreiem Stahl. Auch für Schnittunterbrechungen geeignet.

Chip breaker Overview · Spanbrecher Übersicht

Negative Inserts
Negative Wendeschneidplatten

Mittlere Bearbeitung · Semi-Finishing

Basic

P K

ap· d.o.c. = 1.5~5(mm)
f= 0.2~0.5(mm/r)



Stable flat cutting egde with standard chip breaker for semifinishing of steel and cast iron.

Stabile gerade Schneidkante mit umlaufender Spanleitstufe für die mittlere Bearbeitung von Stahl und Gusswerkstoffen.

Schruppen · Roughing

DR

P K

double side ap· d.o.c. = 2.0~6.5(mm)
f= 0.2~0.5(mm/r)

single side ap· d.o.c. =3~15(mm)
f= 0.4~1.0 (mm/r)



Double side type · Doppelseitige Ausführung

Positive chip breaker with strong cutting edge for light to medium rough machining of steel and cast iron.

Positiver Spanbrecher mit stabiler Schneidkantenausführung für die leichte bis mittlere Schruppbearbeitung von Stahl und Gusswerkstoffen.

Single side type · Einseitige Ausführung



Positive chip breaker with strong cutting edge for light to medium rough machining of steel and cast iron.

Positiver Spanbrecher mit stabiler Schneidkantenausführung für die leichte bis mittlere Schruppbearbeitung von Stahl und Gusswerkstoffen.

ER

M P

double side ap· d.o.c.=2.5~8(mm)
f=0.2~0.6(mm/r)

single side ap· d.o.c. =2.5~20(mm)
f= 0.2~1.2(mm/r)

NEW



NEU

Double side type · Doppelseitige Ausführung

New developed chip breaker with positive geometry for low cutting force. Suitable for roughing operation of stainless steel and steel.
Neu entwickelter positiver Spanbrecher für niedrige Schnittkräfte. Besonders geeignet für die Schruppbearbeitung von rostfreiem Stahl und Stahl.

Single side type · Einseitige Ausführung

New developed chip breaker with positive geometry for low cutting force. Suitable for roughing operation of stainless steel and steel.
Neu entwickelter positiver Spanbrecher für niedrige Schnittkräfte. Besonders geeignet für die Schruppbearbeitung von rostfreiem Stahl und Stahl.

Chip breaker Overview · Spanbrecher Übersicht

Schruppen · Roughing

P M
ap· d.o.c.= 5~15(mm)
f= 0.5~1.2(mm/r)



HDR



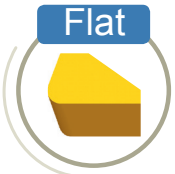
Chip breaker with strong cutting edge and resistent to plastic deformation for single side inserts. Suitable for rough machining with high metal cutting rate for steel and stainless steel application.

Spanbrecher mit stabiler Schneidkantenausführung mit hoher Deformationsbeständigkeit für einseitige Wendeschneidplatten. Anwendnung für die Schruppbearbeitung von Stahl und rostfreiem Stahl.

K
ap· d.o.c.= 0.3~12(mm)
f= 0.1~0.6(mm/r)



Flat



Flat insert without chip breaker. Stable insert with high edge strength for roughing operation in cast iron materials.

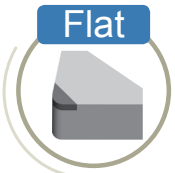
Glatte Platte ohne Spanbrecher. Mit einer stabilen Schneidkante für die Schruppbearbeitung von Gusswerkstoffen.

CBN & PCD

PCBN H PKD N
ap· d.o.c.=0.05~0.5(mm)
f=0.05~0.3(mm/r)



Flat



Special grades: for machining of hardened materials and cast iron (CBN). for machining of non-ferrous metals (e.g. Aluminium) and non-metal materials (PCD)

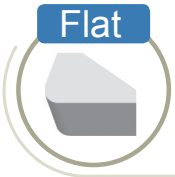
Spezielle Sorten: Für die Bearbeitung von gehärteten Stählen, Gusswerkstoffen (CBN). Für die Beabeitung von NE-Metallen (z.B. Aluminium) und nicht-metallischen Werkstoffen (PCD)

Ceramic Insert

K H P
ap· d.o.c.= 0.1~3(mm)
f= 0.05~0.4(mm/r)



Flat



Ceramic inserts for machining of hardened steel, cast iron and steel.

Keramikwendeschneidplatten für die Bearbeitung von gehärtetem Stahl, Gusswerkstoffen und Stahl.

Chip breaker Overview · Spanbrecher Übersicht

Feinstbearbeitung · Finishing

Positive Inserts
Positive Wendeschneidplatten

P M

ap· d.o.c. =0.05~2.5(mm)
f= 0.03~0.25(mm/r)



R/L

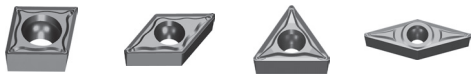


Special grinded chip breaker groove for precision machining and high surface quality. This G-class inserts with a sharp cutting edge and small corner radius for fine finishing operation without vibration.

Exakt geschliffene einseitige Spanleitstufe für die Hochpräzisionsbearbeitung mit hoher Oberflächengüte. Diese G-Toleranz Platten besitzen scharfe Schneiden und kleine Eckenradien. Für die Feinstbearbeitung ohne Vibrationen.

P M K

ap· d.o.c. =0.05~1(mm)
f=0.05 ~0.3(mm/r)



SF



Special chip breaker in combination with cermets grades. Sharp cutting edge with excellent chip control. For high surface finishing and precision machining.

Spezieller Spanbrecher in Kombination mit Cermetsorten. Mit scharfer Schneide für die Präzisionsbearbeitung mit hervorragendem Spanbruch und sehr guter Oberflächengüte.

Schlichten · Finishing

P M K

ap· d.o.c. =0.1~2(mm)
f=0.05~0.3 (mm/r)



HF



Chip breaker for finishing and semi-finishing of steel and cast iron. Especially for internal machining.

Spanbrecher für die Schlicht- bis mittlere Bearbeitung von Stahl und Gusswerkstoffen. Besonders geeignet auch für die Innenbearbeitung.

NEU

M S

ap· d.o.c. = 0.1~2(mm)
f= 0.05~0.3 (mm/r)



NEW

EF



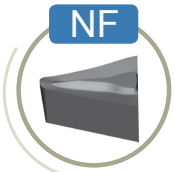
Sharp, positive cutting edge for finishing and semi-finishing of austenitic stainless steel, soft steel and low carbon steel. Suitable for continuous to light interrupted cut.

Sehr scharfe und positive Schneidkante für die Schlicht- bis mittlere Bearbeitung von austenitschem, rostfreiem Stahl, weichem Baustahl und Stahl mit niedrigem Kohlenstoffgehalt.

Chip breaker Overview · Spanbrecher Übersicht

Schlichten · Finishing

NF



S M

ap· d.o.c.= 0.05~1(mm)
f=0.05~0.2 (mm/r)



Chip breaker with sharp and positive cutting edge. NF combined with Grade YBG102 is best solution for finishing of heat resistance super alloys (Ni-based, Fe-based and Co based material).

Geschliffene Wendeschneidplatte mit einer scharfen, positiven Schneidkante. In Kombination mit der Sorte YBG102 ist dieser Spanbrecher besonders für die Schlichtbearbeitung von warmfesten Materialien geeignet (z.B. Ni- basiert, Fe-basiert und Co-basiert).

Mittlere Bearbeitung · Semi-Finishing

HM



P M K

ap·d.o.c. =1~4(mm)
f=0.2~0.5(mm/r)



Chip breaker for medium machining of steel or cast iron. Suitable for internal and external turning.

Spanbrecher für die mittlere Bearbeitung von Stahl und Gusswerkstoffen. Einsetzbar bei der Innen- und Außenbearbeitung.

NEU

EM



M S

ap· d.o.c. = 1~4(mm)
f= 0.2~0.5(mm/r)



NEW

Upgrade sharp and strong cutting edge for semifinishing of adhesive steel and austentic stainless steel.

Scharfe und stabile Schneidkante für die mittlere Bearbeitung von rostfreien adhäsiven Stählen und austenitischen Werkstoffen.

Chip breaker Overview · Spanbrecher Übersicht

Positive Insert
Positive Wendeschneidplatten

Mittlere Bearbeitung · Semi-Finishing

P K

ap· d.o.c.= 1~8(mm)
f= 0.2~0.6(mm/r)



Basic



Chip breaker for round inserts. Suitable for semi precision machining and profile modelling machining of steel and cast iron.

Umlaufende Spanleitstufe für runde WSP. Für die mittlere Bearbeitung und Profildrehen von Stahl- und Gusswerkstoffen.

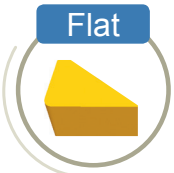
Schruppen · Roughing

K

ap· d.o.c.= 0.05~1(mm)
f =0.05~0.2 (mm/r)



Flat



Flat insert without chip breaker. Stable insert with high edge strength for roughing operation in cast iron materials.

Glatte Platte ohne Spanbrecher. Mit einer stabilen Schneidkante für die Schruppbearbeitung von Gusswerkstoffen.

Schruppen · Roughing

P M K

ap· d.o.c. =2~5(mm)
f=0.2~0.4(mm/r)



HR



Chip breaker with strong cutting edge for light to medium rough machining of steel stainless steel and cast iron. Suitable for internal and external machining.

Spanbrecher mit stabiler Schneidkantenausführung für die leichte bis mittlere Schruppbearbeitung von Stahl und Gusswerkstoffen. Einsetzbar bei der Innen- und Außenbearbeitung.

P

ap· d.o.c. =3~10(mm)
f=0.3~1.2(mm/r)



Basic



Recommended chip breaker for rough machining steel materials. Single chip breaker with strong cutting edge. First choice for profile modelling machining.

Spezieller Spanbrecher mit einer verstärkten Schneidkantenausführung für die Schruppbearbeitung. Besonders geeignet für die Konturbearbeitung bei höherer Produktionssicherheit von Stahlwerkstoffen unter ungünstigen Bedingungen.

Chip breaker Overview · Spanbrecher Übersicht

N

ap· d.o.c.=0.1~5(mm)
f=0.05~0.4(mm/r)



Special chip breaker for aluminum alloy and non ferrous metal machining
G tolerance insert with large rake angle, surface polishing treatment, effectively preventing build up edge and getting high quality machining surface and long tool life.



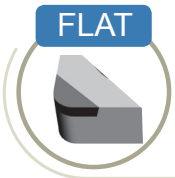
Speziell geschliffener Spanbrecher für die Bearbeitung von Aluminium, Aluminiumlegierungen (NE-Metallen). G-Toleranz WSP mit großem Spanwinkel und polierter Oberfläche zur Vermeidung von Aufbauschneiden. Hervorragender Spanabfluss, gute Oberflächengüten und lange Standzeiten.

PCBN H PKD N

ap· d.o.c.=0.05~0.5(mm)
f=0.05~0.3(mm/r)



Special inserts G tolerance with brazed CBN or PCD Tip. CBN suitable for finishing of hardened component and cast iron. PCD suitable for finishing of non ferrous metal and non-metal meterials.



Spezielle G Toleranz WSP mit gelöteter CBN oder PKD Schneidecke. CBN ist besonders für die Schlichtbearbeitung von gehärtetem Stahl oder Grauguss geeignet, PKD für die Schlichtbearbeitung von NE-Metallen und nicht metallischen Werkstoffen (Glasfiber, Keramik, glasfaserverstärkte Kunststoffe).

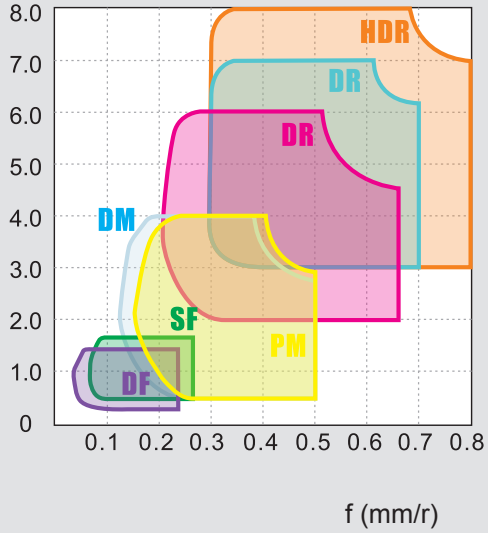
A

Chip breaker Cutting Condition · Spanbrecher Schnittdatenempfehlung

Main Chip breaker for general Turning · Hauptspanbrecher für allgemeine Drehbearbeitung

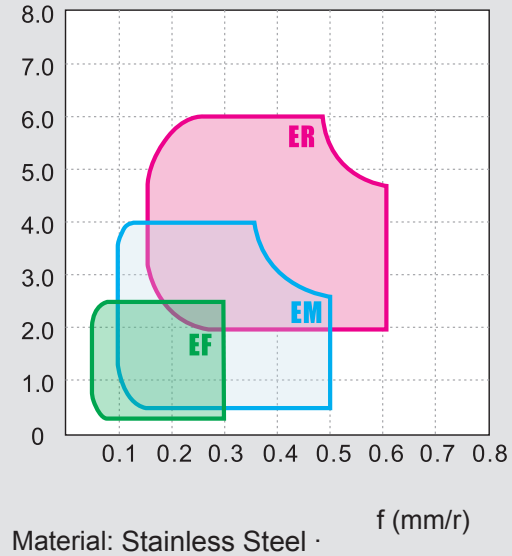
Negative Insert· Negative Wendeschneidplatten

ap· d.o.c.(mm)



Material: Steel · Stahl C 45

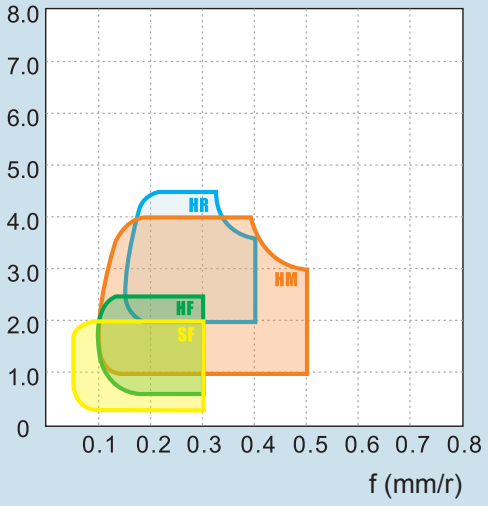
ap· d.o.c.(mm)



Material: Stainless Steel · Rostfreier Stahl (1Cr18Ni9Ti)

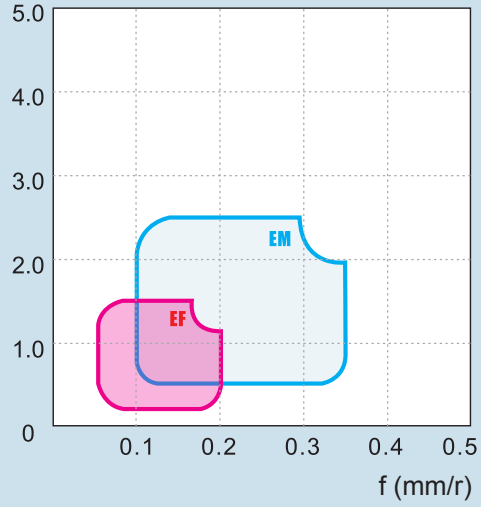
Positive Inserts· Positive Wendeschneidplatten

ap· d.o.c.(mm)



Material: Steel · Stahl C 45

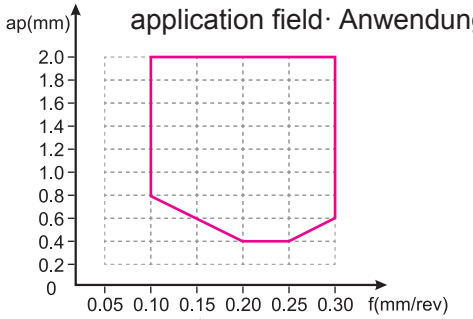
ap· d.o.c.(mm)

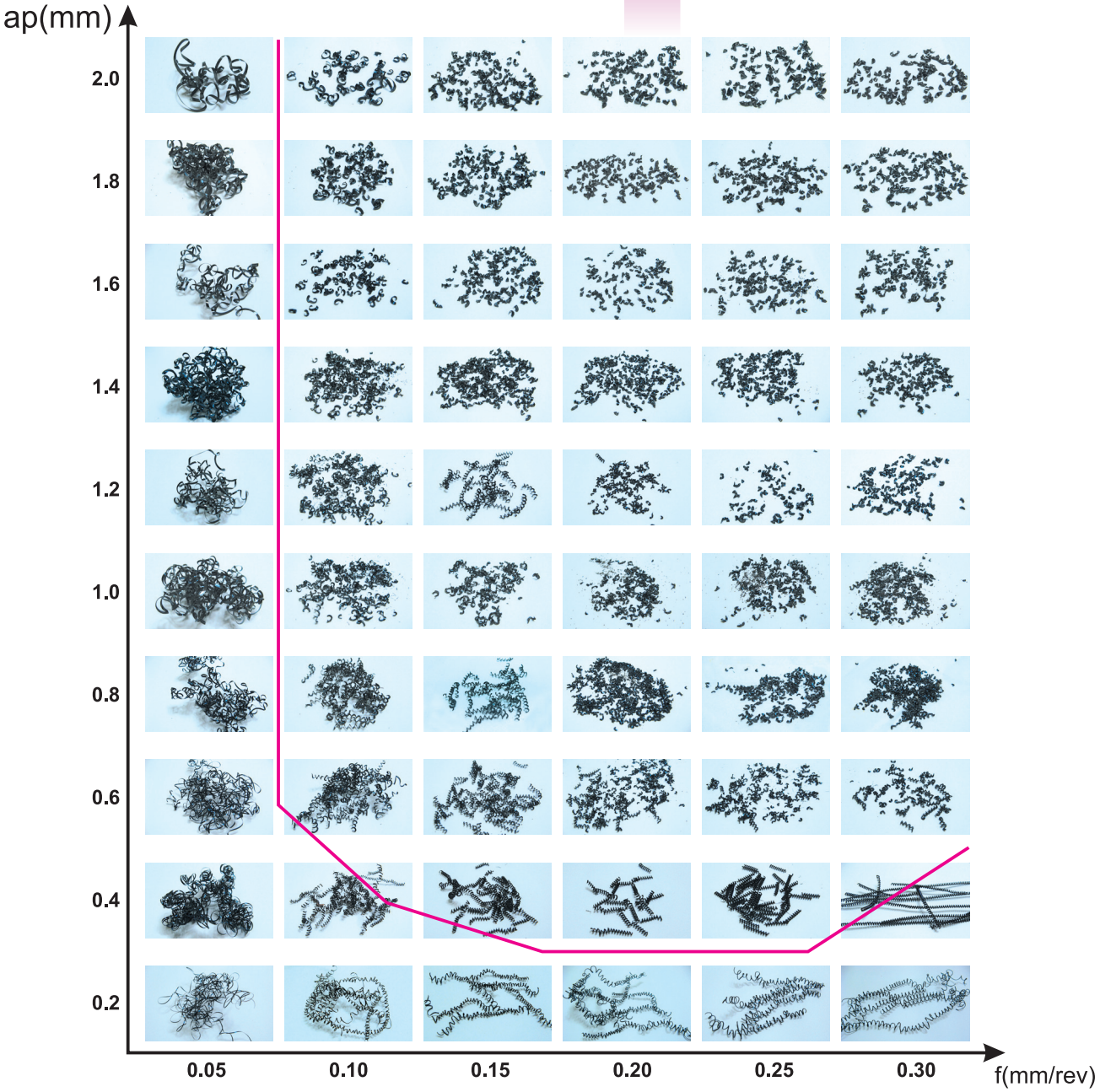


Material: Stainless Steel · Rostfreier Stahl (1Cr18Ni9Ti)

Chip breaker application field · Spanbrecher Anwendungsfeld

Example· Beispiel:
Insert· WSP: CNMG120408-DF
Cutter· Halter: PCLNL2525M12
Material: C 45 steel
V_c: 200(m/min)





WG

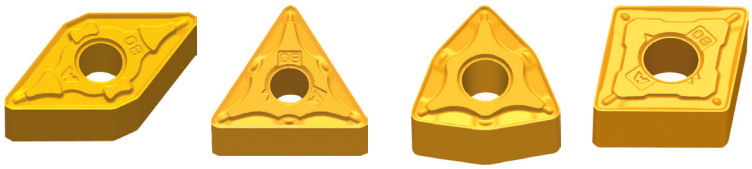


chip breaker series
WG Spanbrecher Serie

Turning Insert with **WIPER**-Technology
Drehplatten mit **WIPER**-Technologie



WIPER

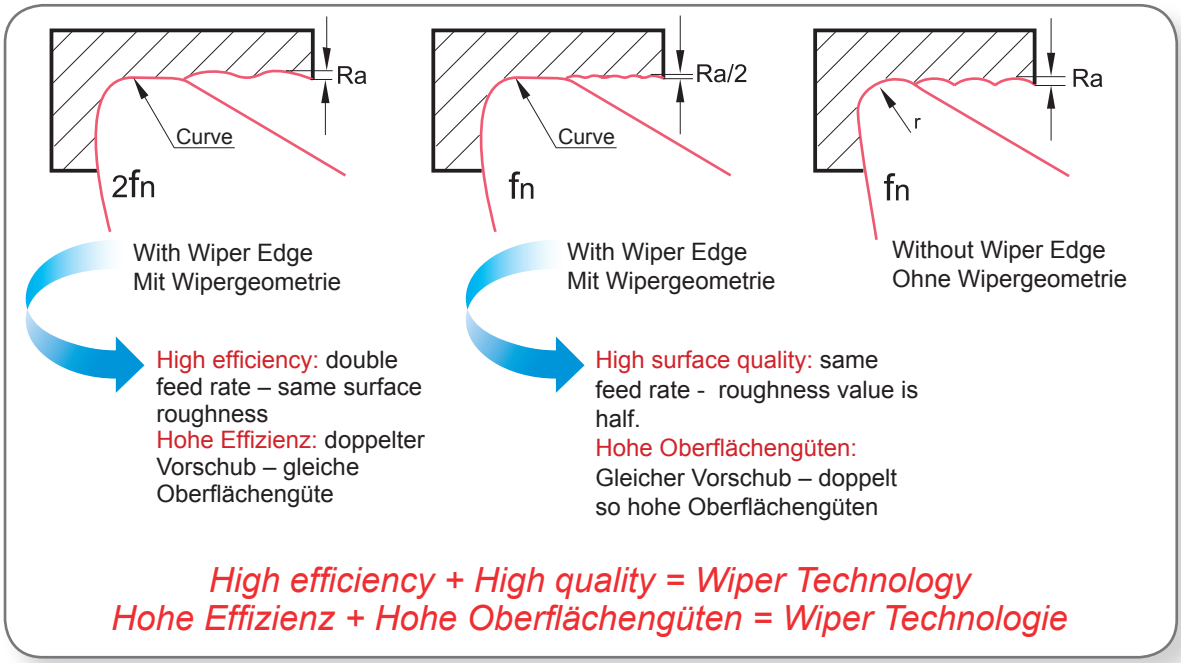


Machining a good surface finish on turned components has become a demand for semi-finishing and finishing operations. The Wiper technology has provided turning with a new means to achieve improved production performance where the key is to being able to raise the feed rate.

Bei der Schlicht- bis mittleren Bearbeitung von Drehteilen nimmt die Realisierung von hohen Oberflächengüten an Bedeutung zu. Dank der Wiper-Technologie kann diese Anforderung auch bei höheren Vorschüben realisiert werden. Ein weiterer Vorteil ist die Steigerung der Produktivität.

A Wiper insert has a special design of nose configuration. It has been developed to provide a high capability of generating a better surface finish. On the other hand, is capable of machining the same finish at a much higher feed.

Eine Wiperplatte zeichnet sich durch eine spezielle Modifikation des Eckenradius aus. Dadurch ist bei gleichem Vorschub, verglichen mit einer herkömmlichen Drehplatte, eine deutliche Verbesserung der Oberflächengüte zu erzielen. Eine weitere Möglichkeit ist die Verdoppelung des Vorschubes für eine höhere Produktivität, wobei die Oberflächengüten gleich bleiben.



Feature·Merkmale:

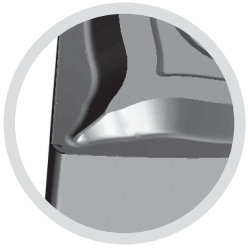
By using a Wiper inserts you can get excellent surface quality and eliminate many grinding operations. You also get better component quality and roundness compared to grinding.

Durch die Verwendung von Wendeschneidplatten mit Wipertechnologie lassen sich hohe Oberflächengüten erzielen und somit viele Schleifoperationen ersetzen. Die Werkstückqualitäten z.B. in Bezug auf Rundheit kann im Vergleich zum Schleifen ebenfalls gesteigert werden.



EF EM ER

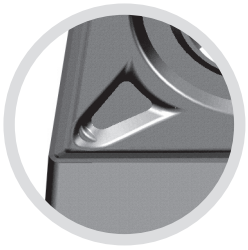
Special chip breaker series for soft steel, stainless steel and heat resistance Superalloy
Spezielle Spanbrecherserien besonders für die Zerspanung von weichem Stahl, rostfreien (M) Stählen und warmfesten Superlegierungen.



-EF

Sharp positive cutting edge for finishing and semifinishing of austenitic stainless steel, soft steel and low carbon steel. Suitable for continuous to light interrupted cut.

Scharfer, positiver Spanbrecher für die Schlichtbearbeitung von rostfreien Stählen, weichem Stahl, Automatenstahl und für Stähle mit niedrigem Kohlenstoffgehalt. Für glatte bis leicht unterbrochene Schnitte.



-EM

Sharp cutting edge with stronger edge line for medium cut even in interrupted cut.

Scharfe, stabile Schneidkante für die mittlere Bearbeitung von Werkstoffen auch im unterbrochenen Schnitt.



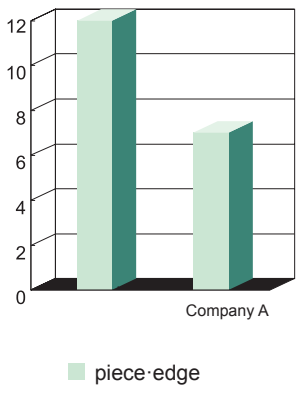
-ER

Special edge design with exellent balance between egde strength and sharpness. Suitable for roughing operation.

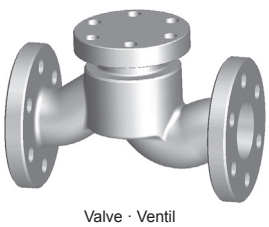
Speziell entwickelter Spanbrecher mit exzellenter Kantenstabilität bei gleichzeitiger Schneidenschärfe, für die Schruppbearbeitung.

Example· Beispiel:

CNMG120408-**EM**
YBG202



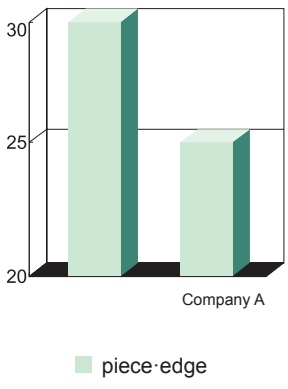
Parameter:	
D	135mm
V_c	150 m/min
f	0.25mm/rev
ap	2.5 mm



Valve · Ventil

Example· Beispiel:

CNMG120408-**EF**
YBG202

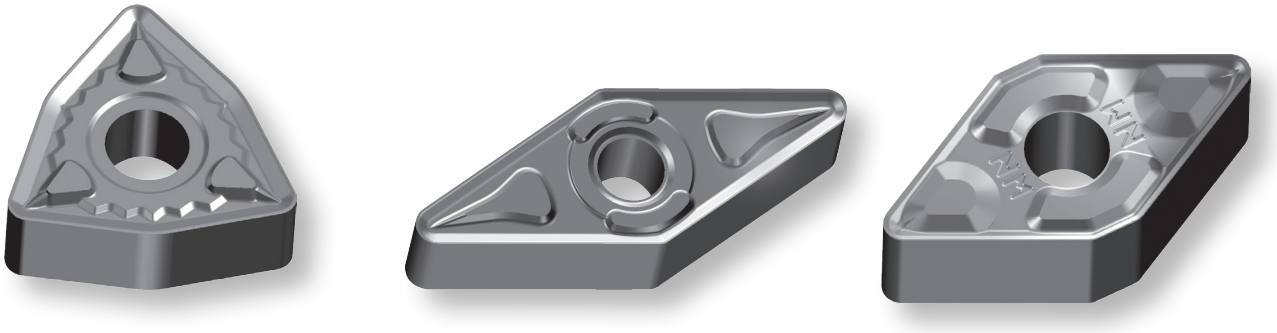


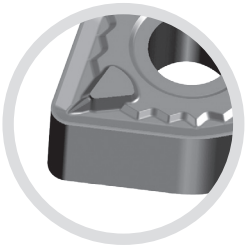
Parameter:	
D	89 mm
V_c	180 m/min
f	0.15mm/rev
ap	1.0 mm

NF NM

NEW

Special chip breaker series for machining heat resistance and super alloy material.
Neue Spanbrecherserie für die Bearbeitung von hochlegierten, warmfesten Materialien.





-NF

Ground inserts with sharp and positive cutting edge. NF combined with grade YBG102 is a good solution for the finishing of heat resistant super alloys (nickel-based such as Inconel 700,718, iron-based and cobalt-based alloys). ap=0.2~1.0mm,Vc=40~100m/min.

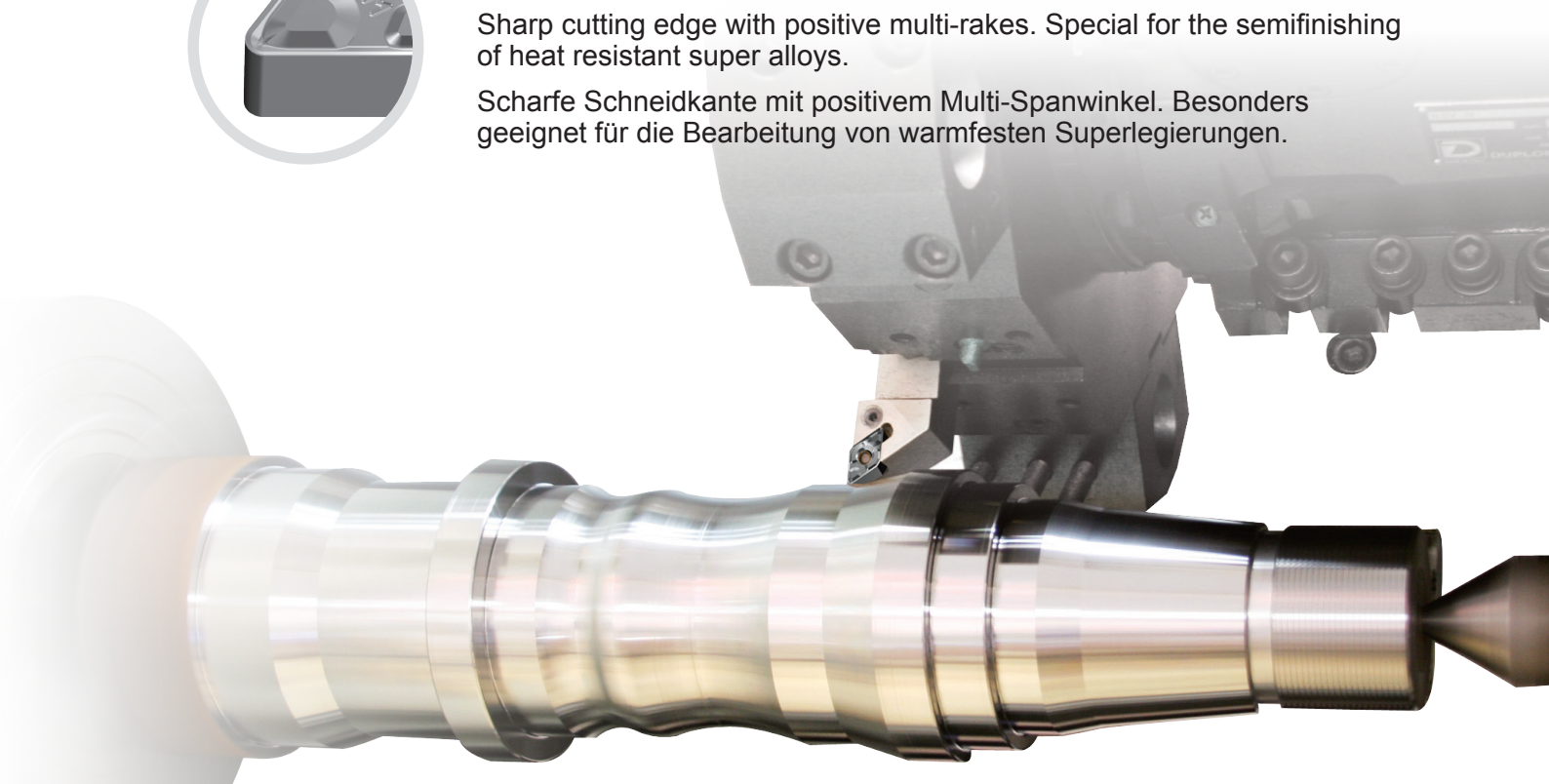
Geschliffene Wendeschneidplatte mit einer scharfen positiven Schneidkante. NF in Kombination mit der Sorte YBG102 ist eine gute Lösung für Schlichtbearbeitungen von warmfesten Superlegierungen (Ni-basiert wie Inconel 700,718, Fe-basiert und Co-basiert) ap=0.2~1.0mm,Vc=40~100m/min.

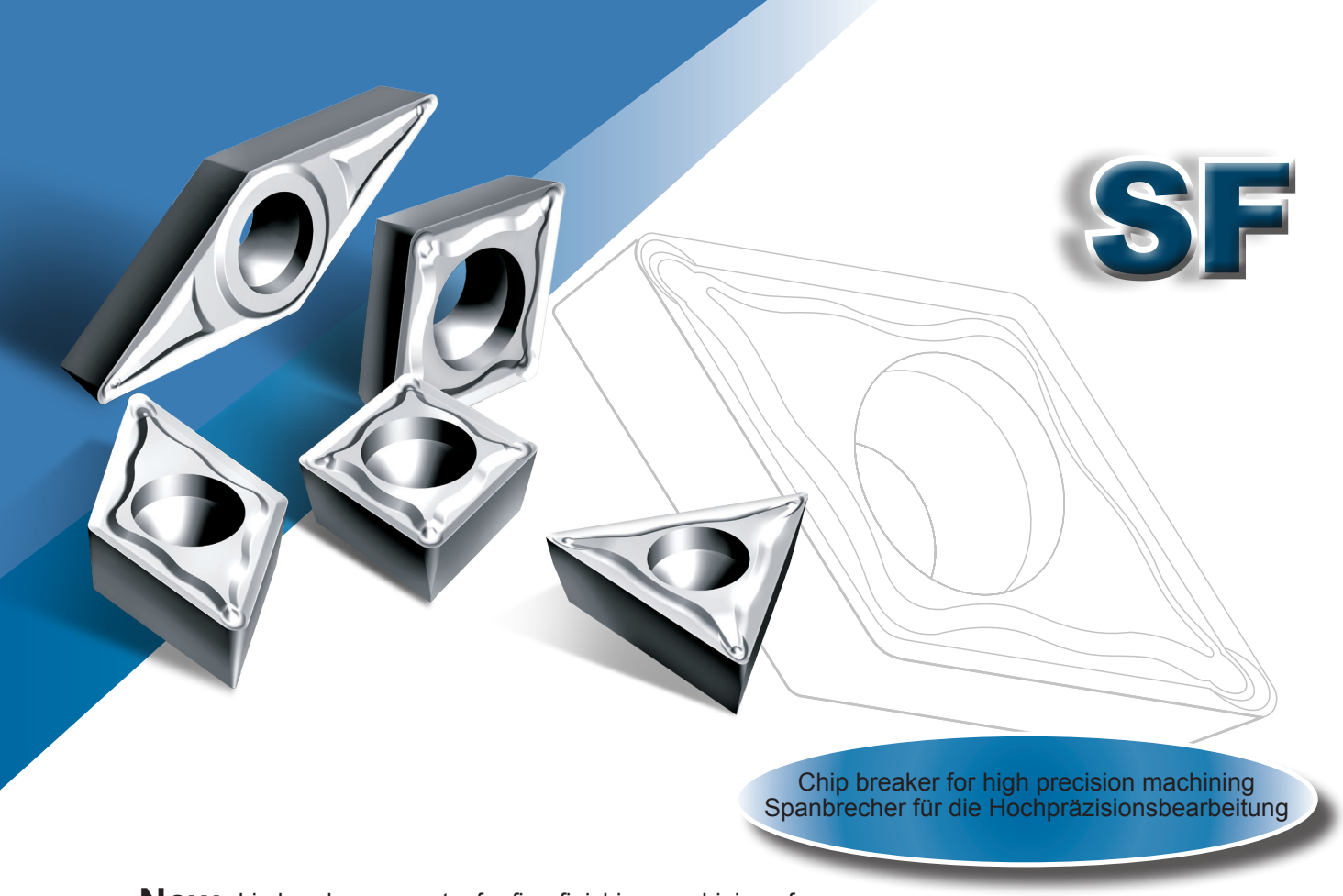


-NM

Sharp cutting edge with positive multi-rakes. Special for the semifinishing of heat resistant super alloys.

Scharfe Schneidkante mit positivem Multi-Spanwinkel. Besonders geeignet für die Bearbeitung von warmfesten Superlegierungen.





SF

Chip breaker for high precision machining
Spanbrecher für die Hochpräzisionsbearbeitung

New chip breaker geometry for fine-finishing machining of steel, stainless steel and cast iron. In combination with our cermet grades a good solution for high precision production.

Neue Spanbrecher für die Feinstbearbeitung von Sathl, rostfreiem Stahl und Gusswerkstoffen. In Kombination mit unseren Cermetsorten die beste Wahl für die Hochpräzisionsbearbeitung.

1. High precision
   Hohe Genauigkeit

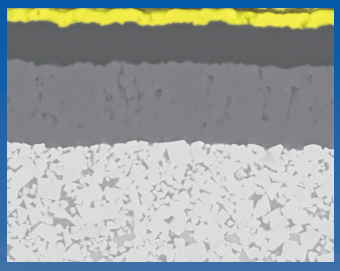
2. Sharp cutting edge to reduce cutting force and vibration
   Scharfe Schneidkante zur Reduktion von Schnittkraft und Vibrationen.

3. Excellent chip control
   Ausgezeichnete Spankontrolle

4. Excellent surface quality
   Ausgezeichnete Oberflächengüte

Best result in combination with our carbide anti-vibration boring bars.
Beste Ergebnisse in Kombination mit unseren Antivibrations Hartmetallbohrstangen.





YBC251 coating

Application field CVD, turning grade of steel
Anwendungsbereich CVD, Drehsorten für Stahl

YBC 151

CVD coated grade with good wear resistance in combination with MT-Ti(CN), thick layer AL2O3, TiN coating. Good for finishing of steel and dry machining.

CVD-beschichtete Premiumsorte mit ausgezeichneter Verschleißfestigkeit. Die Kombination von MT-TiCN und einer dicken AL2O3 TiN Auflage eignet sich zum Schlichten von Stahl und zur Trockenbearbeitung.

YBC 251

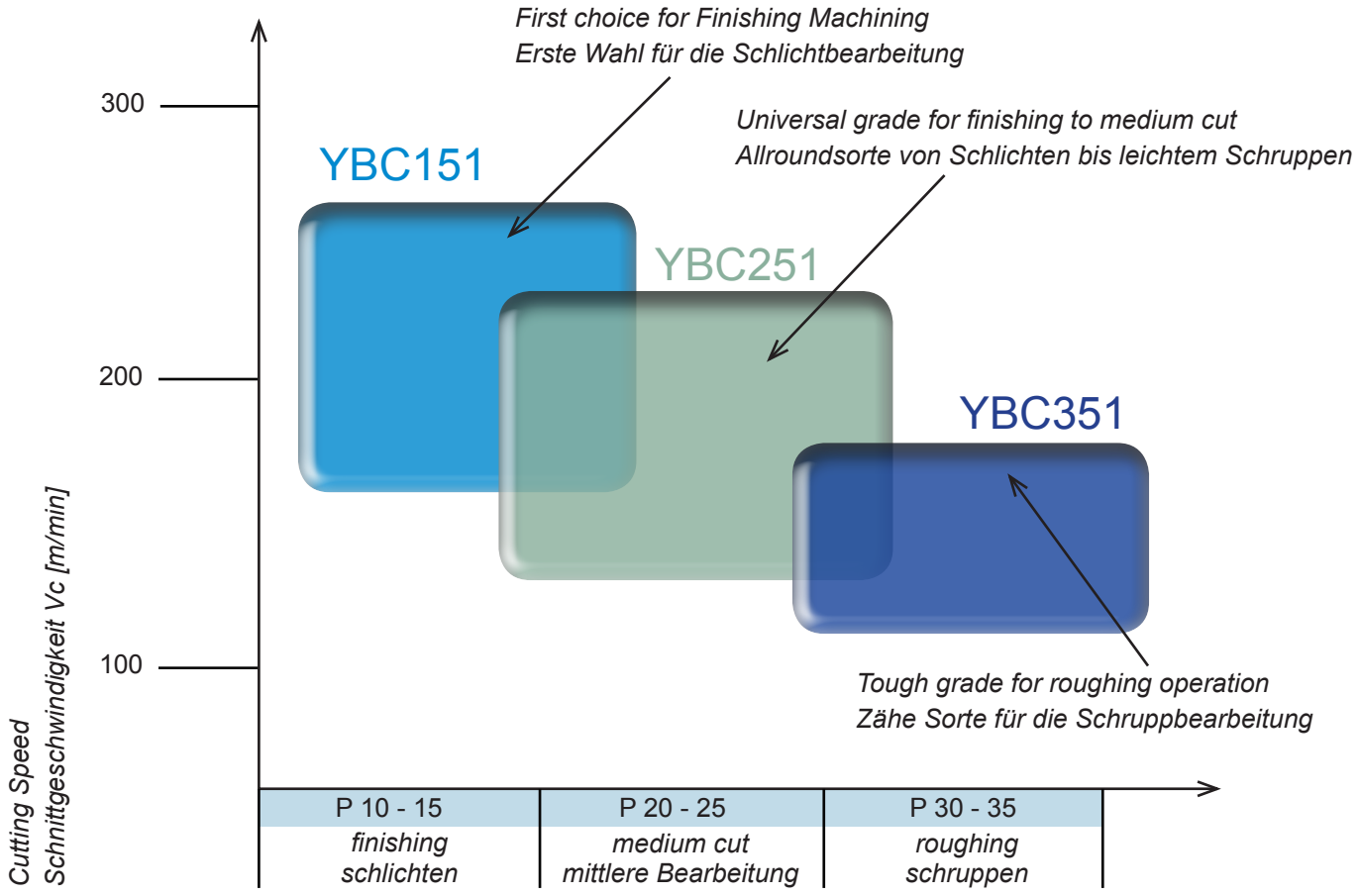
CVD premium universal grade with excellent combination of toughness and wear resistance. In combination with MT-Ti(CN), thick layer AL2O3, TiN coating this grade is first choice for medium to light interrupted cutting of steel.

CVD-beschichtete Hochleistungs-Allroundsorte mit guter Schneidkantensicherheit und Verschleißfestigkeit. In Verbindung mit der MT-TiCN und einer dicken AL2O3 TiN Beschichtung eignet sich diese Sorte für die mittlere Bearbeitung bis zu leichtem Schruppen von Stahl.

YBC 351

CVD coated premium grade with high toughness and wear resistance. In combination with MT-Ti(CN), thick layer AL2O3, TiN coating this grade is suitable for rough machining of steel under unstable condition.

CVD-beschichtete Premiumsorte mit hoher Zähigkeit und Verschleißfestigkeit. Die Kombination von MT-TiCN und einer dicken AL2O3 TiN Auflage eignet sich besonders für die leichte bis schwere Schruppbearbeitung von Stahl.



Application field CVD, turning grade of stainless Steel

Anwendungs-bereich CVD, Drehsorten für rostfreien Stahl

YBM 151

Substrate with special structure, in combination with TiCN, thin layer AL_2O_3, TIN coating. With resistance against diffusion wear and plastic deformation it is good for finishing and semi-finishing of stainless steel.

CVD-beschichtetes Hartmetall. Die besonders strukturierte Kombination mit TiCN und Al2O3, TiN Auflage hat eine ausgezeichnete Schichthaftung und Widerstandsfähigkeit gegen plastische Verformung. Gut geeignet für die Schlicht- bis mittlere Bearbeitung von rostfreiem Stahl.

YBM 251

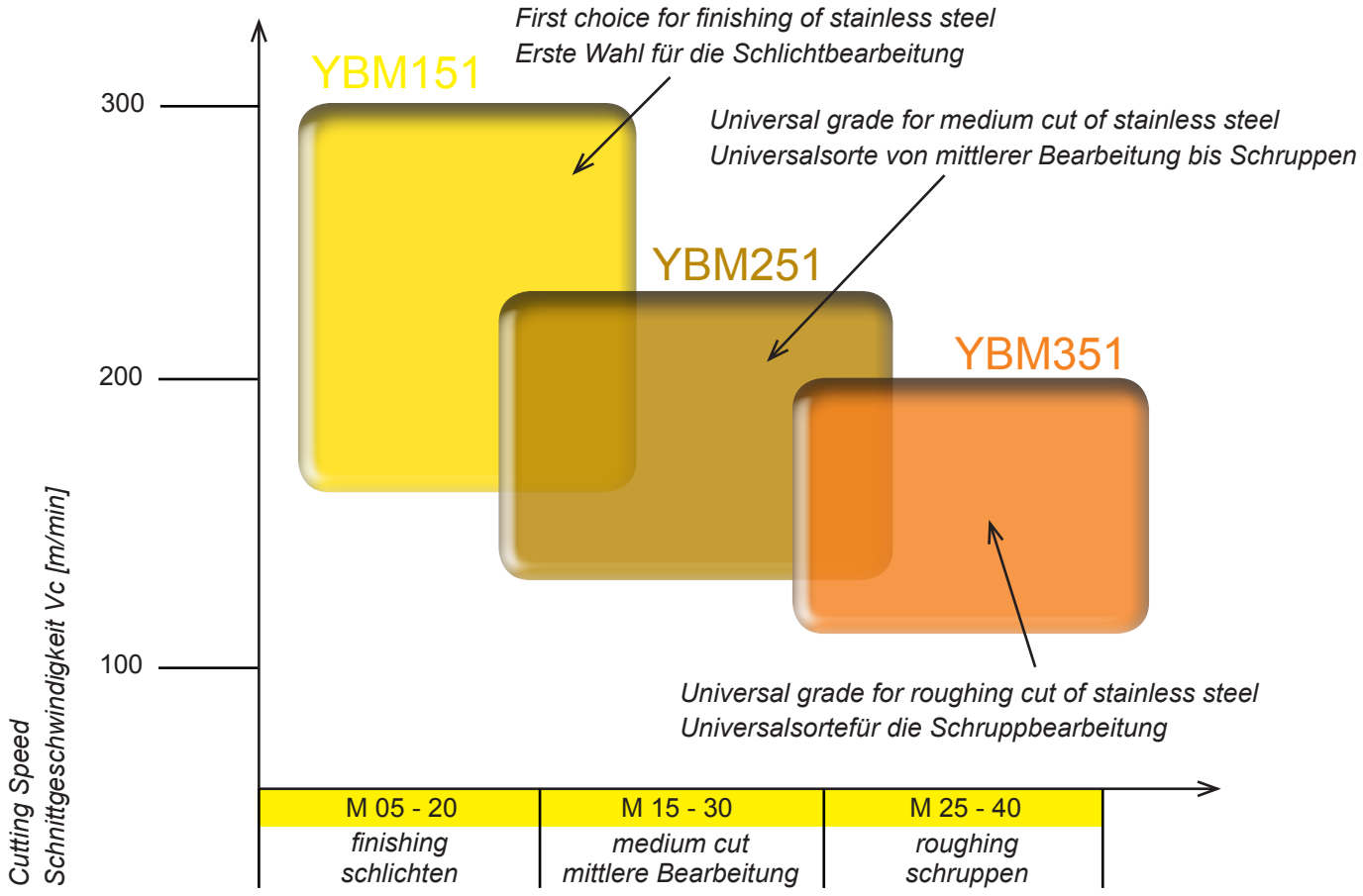
Substrate with good toughness and strength, in combination with Ti(CN), thin layer AL_2O_3, TiN coating. It is a premium grade for semi-finishing to light roughing of stainless steel at continuous and intermittent machining conditions.

Universal einsetzbares CVD-beschichtetes Hartmetall aus TiCN, Al2O3 und TiN mit guter Zähigkeit und Verschleißfestigkeit. Optimiert für mittlere Drehbearbeitung von rostfreiem Stahl mit und ohne Schnittunterbrechung.

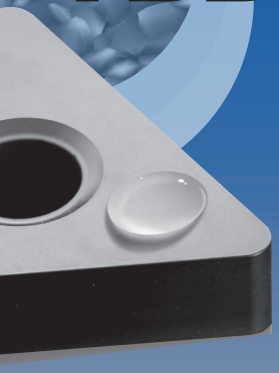
YBM 351

Coated carbide grade with very good strength and impact resistance. It is suitable for rough turning of stainless steel at low to moderate cutting speed or interrupted cutting,

Beschichtete Hartmetallsorte mit ausgezeichneter Widerstandsfähigkeit und Schneidkanten-sicherheit. Ideal für schwere Schruppbearbeitung von rostfreiem Stahl und Stahl bei mittleren Schnittgeschwindigkeiten oder bei Schnittunterbrechung.

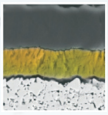


YBD



Application field CVD, turning grade of Cast Iron
Anwendungsbereich CVD, Drehsorten für Guss

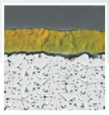
YBD 052



CVD coated grade with excellent wear resistance in combination with MT-Ti(CN), thick layer AL2O3. Best grade for machining of gray cast iron (GG) under high speed and dry machining.

CVD-beschichtete Premiumsorte mit ausgezeichneter Verschleißfestigkeit. Die Kombination von MT-TiCN und einer dicken AL2O3 Auflage eignet sich besonders zum Bearbeiten von Grauguss (GG) bei hohen Schnittgeschwindigkeiten und Trockenbearbeitung.

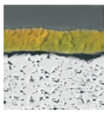
YBD 102



Modified CVD coating the hard fine grain carbide substrate. It is optimized for machining of cast iron, swpecial nodular cast iron and hard steel at high speeds.

Modifizierte CVD Beschichtung auf einem hartem feinkörnigen Hartmetall. Es optimiert für die Bearbeitung von Guss, besonders Kugelgraphitguss und hoch vergütetem Stahl bei hohen Geschwindigkeiten.

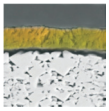
YBD 152



Hard medium fine corn substrate in combination of TiCN, thick AL_2O_3, coating. It is suitable for machining of gray cast iron and nodular cast iron under normal cutting conditions from low to moderate cutting speeds.

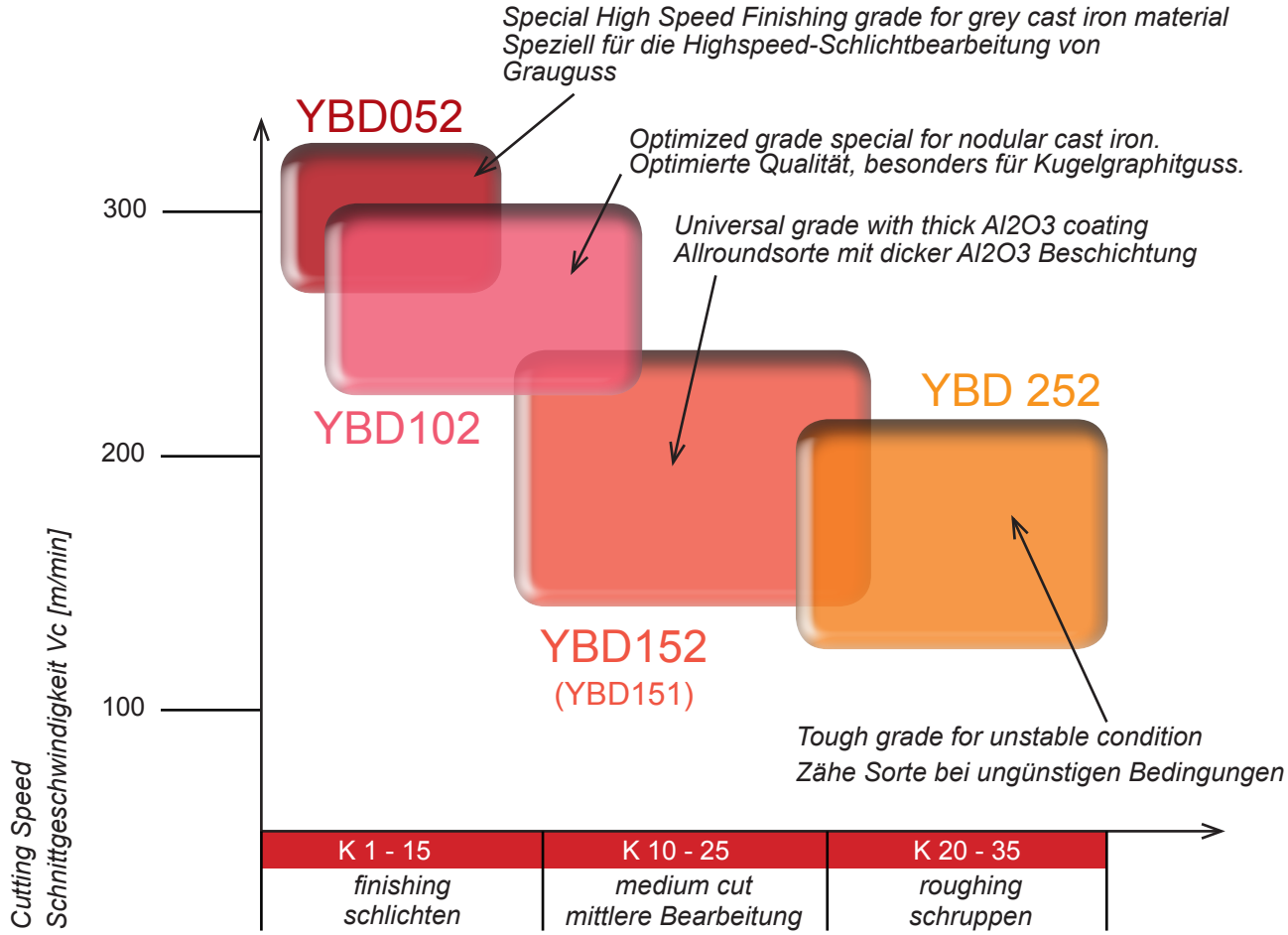
Hartes mittel-feinkörniges Substrat mit TiCN, dicker AL_2O_3 Auflagen. Es ist geeignet für die Bearbeitung von Grauguss und Kugelgraphitguss mit niedrigen bis mittleren Schnittgeschwindigkeiten.

YBD 252

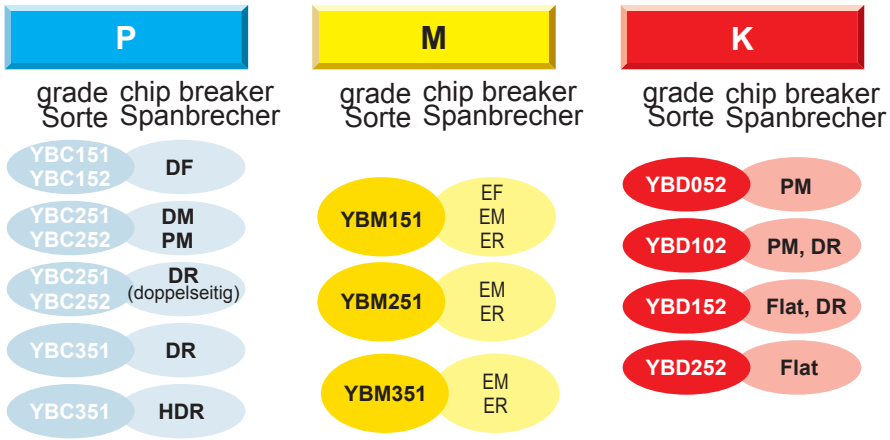


Tough substrate in combination with TiN,TiCN, thick AL_2O_3 coating. it is good for turning of cast irons under favoable conditions. And for milling of cast iron and ally steel.

Zähes Substrat mit TiN, TiCN, dicke AL_2O_3 Auflagen. Zum Drehen von Guss bei ungünstigen Bedingungen. Zum Fräsen von Guss und legierten Stahl.



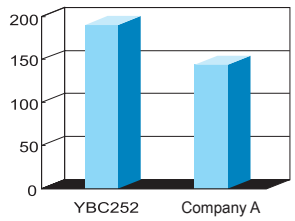
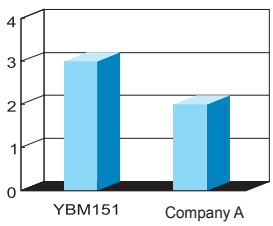
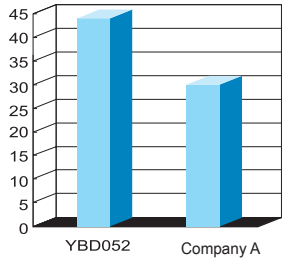
■ Recommended combination of grades, chip breaker and cutting data.
Empfohlene Kombination von Sorten, Spanbrechern und Schnittdaten.

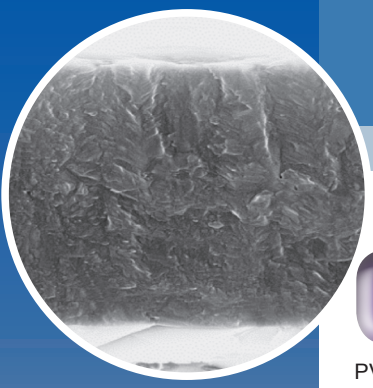


■ Recommended cutting condition· Empfohlene Schnittdaten

Workpiece Material Werkstück Material		application · Anwendung	grade · Sorte	Recommended Cutting Speed m/min Schnittgeschwindigkeit m/min
P	Steel Stahl	Finishing Schlichten	YBC151	180-460
			YBC152	220-500
		Semi-finishing Mittlere Bearbeitung	YBC251	160-440
			YBC252	180-480
		Roughing	YBC351	130-380
M	Stainless Steel Rostfreier Stahl	Semi-finishing Mittlere Bearbeitung	YBM151 YBM251 YBM 351	110-280
K	Cast Iron Gusseisen	Roughing Schruppen	YBD052	200-500
			YBD102	200-480
		Semi-finishing Mittlere Bearbeitung	YBD151	180-450
			YBD152	190-450
		Roughing	YBD252	150-380

Machining example · Bearbeitungsbeispiele

Application Anwendung	Typ	WNMG060408 PM	CNMG190616-ER	TNMA220412
	Grade Sorte	YBC252	YBM151	YBD052
Workpiece Werkstück				
Workpiece Material & Hardness		45 steel HB220	Duplex Stainless Steel HB260	Grey cast iron HB280
Cutting Condition Schnitt-bedingungen	Parameters Schnittdaten	V=220m/min ap=1.5~2mm f=0.25mm/r	V=103m/min ap=1.5mm f=0.3mm/r	V_{max}=400m/min ap=1.3~2.5mm f=0.4~1.1mm/r
	Cutting Liquid Kühlmittel	Dry Cutting · Trockenbearbeitung	Dry Cutting · Trockenbearbeitung	Dry Cutting · Trockenbearbeitung
Machining result Ergebnis Werkstücke pro Schneide Workpiece Per Edge				



COATED Cemented Carbide PVD
Beschichtestes Hartmetall PVD

Makes it easy to machine materials which hard to be machined...

Die Lösung für die Bearbeitung von schwer zu zerspanenden Materialien...

YBG 102
N10 (N01-N10)
S10 (S01-S20)

PVD nano-TiAlN coated fine grain cardide grade. It is suitable for finishing and semi-finishing turning of high-temperature alloys, nonferrous metal(Aluminium with Si>=12%) and finishing of stainless steel.

Nano-TiAlN PVD-beschichtete, fein körnige Hartmetallsorte. Gut geeignet zum Drehen von warmfesten Superlegierungen, NE-Metallen (Aluminium mit Si>=12%) und zum Schlichten von rostfreiem Stahl.

YBG 202
P20 (P10-P25)
M20 (M10-M25)

PVD nano-TiAlN (2~4um) coated fine grain carbide grade. Good performance in combination of toughness and wear resistance, suitable for turning, parting, grooving of steel, stainless steel, cast iron and high-temperature alloys in finishing and semi-finishing machining.

Nano-TiAlN (2~4um) PVD beschichtete, feinkörnige Hartmetallsorte. Hervorragende Kombination von Zähigkeit und Verschleißfestigkeit. Zum Drehen, Ab- und Einstechen von Stahl, rostfreiem Stahl, Guss und warmfesten Superlegierungen bei leichter und mittlerer Bearbeitung.

YBG 205
P20 (P10-P30)
M20 (M10-M30)

New nano structure coating process ensures higher toughness but also hardness. This coating grade results in smooth surface finish on the insert, which reduce friction and improved chip flows. Excellent thermal and chemical resistance. This grade is suitable to machine stainless steel and high temperature alloy.

Neue Nano-Beschichtungsstruktur mit gleichzeitiger Härte und Verschleißfestigkeit bzw. Zähigkeit. Eine ultra glatte Schichtoberfläche vermindert die Reibung und garantiert einen optimierten Spanabfluß. Die exzellente thermische und chemische Widerstandsfähigkeit zeigt diese Sorte besonders bei der Bearbeitung von rostfreien Stählen und warmfesten Legierungen.

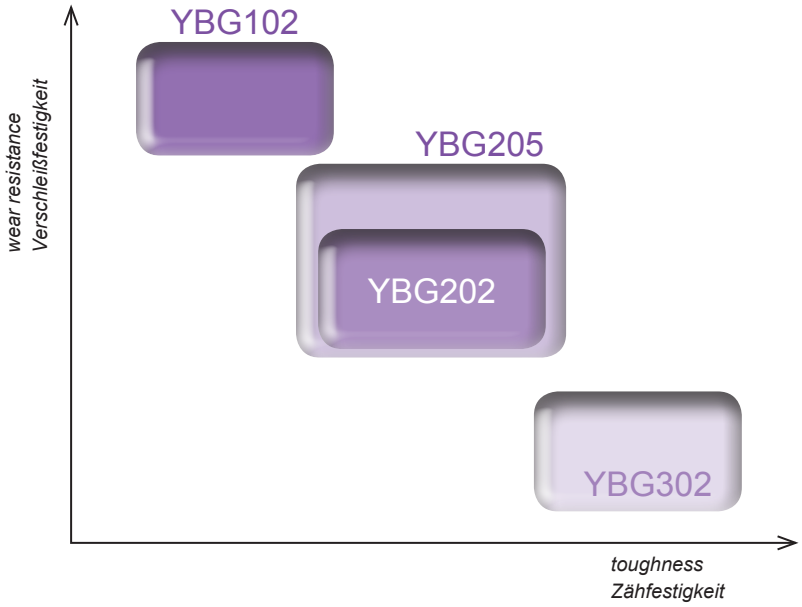
YBG 302
P30 (P20-P35)
M10 (M20-M35)

Substrate with good toughness and strength. PVD nano-TiAlN caoted. It is a universial PVD grade for steel, stainless steel in turning, parting off, and grooving operation.

Universial einsetzbares PVD-beschichtetes Hartmetall mit guter Zähigkeit und Verschleißfähigkeit. Zum Drehen, Ab- und Einstechen von Stahl und rostfreiem Stahl sowie Guss.

Special Coating process for smooth insert surface
Reduce friction - best chip evacuation
combination of wear resistance and toughness
best thermal and chemical stability

Spezieller Beschichtungsprozeß mit sehr glatter Oberflächenstruktur
Reduzierte Reibung - exzellenter Spanfluß
Kombination aus Verschleißfestigkeit und Zähigkeit.
Beste thermische und chemische Stabilität.



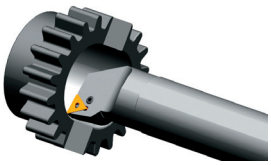
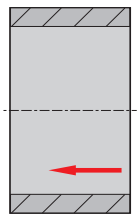
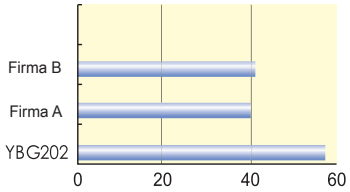
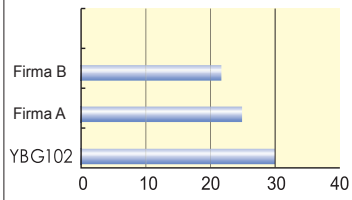
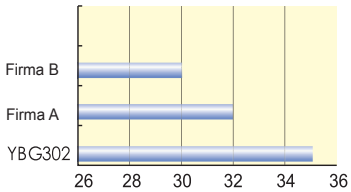
■ Recommended combination of grades, chip breaker and cutting data.
Empfohlene Kombination von Sorten, Spanbrechern und Schnittdaten.

P		M		S	
grade Sorte	chip breaker Spanbrecher	grade Sorte	chip breaker Spanbrecher	grade Sorte	chip breaker Spanbrecher
YBG202	DM	YBG202	EF	YBG102	NF
		YBG202	EM	YBG102	NM
		YBG205	EM		

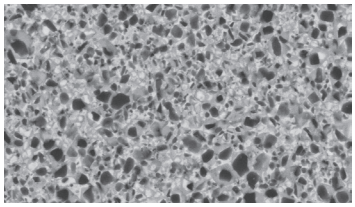
■ Recommended cutting condition· Empfohlene Schnittdaten

Workpiece Material Werkstück Material		application · Anwendung	grade · Sorte	Recommended Cutting Speed m/min Schnittgeschwindigkeit m/min
P	Steel Stahl	Finishing Schlichten	YBG102	180-460
		Semi-finishing Mittlere Bearbeitung	YBG202	150-380
		Roughing Schruppen	YBG302	130-360
M	Stainless Steel Rostfreier Stahl	Finishing· Semi-Finishing Schlichten· Mittlere Bearbeitung	YBG202	170-300
		Roughing Schruppen	YBG302	120-250
S	Heat-Resistant Steel Warmfester Stahl	Finishing Schlichten	YBG102	30-90
		Roughing	YBG202	150-380

Machining example · Bearbeitungsbeispiele

Application Anwendung	Typ	CNMG120404-EF	DNEG150404-NF	CMM160612-DR
	Grade Sorte	YBG 202	YBG102	YBG302
Workpiece Werkstück				
Workpiece Material & Hardness		0Cr18Ni9 HB240	Inconel 718 HRC≥39	30Cr1Mo1V HB220-260
Cutting Condition Schnitt-bedingungen	Parameters Schnittdaten	V=200m/min ap=1mm f=0.15mm/r	Vc=80m/min ap=0.3mm f=0.15mm/r	V=100m/min ap=6mm f=0.5mm/r
	Cutting Liquid Kühlmittel	Dry Cutting· Trockenbearbeitung	Dry Cutting· Trockenbearbeitung	Dry Cutting· Trockenbearbeitung
Machining Effect Ergebnis Workpiece per Edge Werkstücke pro Schneide				

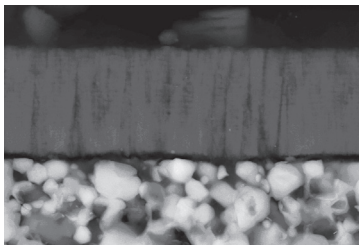
Cermet
Cermet



The cermet has higher hardness and oxygen-resistant under high temperature. The further advantage of cerments is to get the excellent surface quality and tolerance under higher speed.

Die Vorteile von Cermets zeigen sich in großer Härte, Oxidationsbeständigkeit und Hochtemperaturbeständigkeit. Die weiteren Vorteile von Cermets sind exzellente Oberflächen bei hohen Schnittgeschwindigkeiten und konstanter Maßhaltigkeit.

Coated-Cermet
Beschichtetes Cermet



YNG151 TiCN based cermet, with the combination of hardness, excellent toughness, excellent, resistence thermoplastic. It is suitable for super-finishing and finishing of steel, stainless steel and cast iron.

YNG151C TiCN based cermet, through spezial pretreatment, plus PVD Nano-TiAIN coating. Optimal combination of high wear resistance and good edge toughness, suitable for the superfishing and finishing of steel, stainless steel and cast iron for high surface finishing.

YNG 151 auf der Basis von Ti(cn)Cermet verbunden mit Härte, Zähigkeit und Widerstandsfähigheit gegen plastische Verformung und Aufbauschneidenbildung. Geeignet zum Schlichten und Feinschlichten von Stahl, rostfreiem Stahl und Guss für eine höhere Oberflächengüte.

YNG151C TicN Cermet. Plus PVD NaNO-TiAIN Beschichtung: Optimale Kombination von sehr hoher Verschleißfestigkeit und Schneidkantenzähigkeit. Zum Feinschlichten und Schlichten von Stahl, rostfreiem Stahl und Guss für eine hohe Oberflächengüte.

■ Recommended Cutting Conditions · Empfohlene Schnittdaten

Workpiece Material Werkstückstoff		application · Anwendung	Grade · Sorte	Recommended Cutting Speed m/min Schnittgeschwindigkeit m/min
P	Steel/ Stahl	Finishing machining Schlichten	YNG151	260-550
			YNG151C	260-580
M	Stainless Steel/ Rostfreier Stahl		YNG151	170-330
			YNG151C	160-350
K	Cast Iron/ Gusseisen		YNG151	250-400
			YNG151C	270-420

Machining example · Bearbeitungsbeispiele



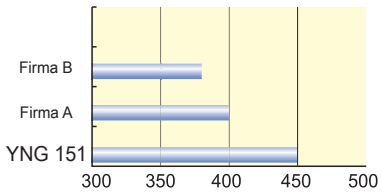
Application/ Anwendung: YNG151·CNMG120404-SF

Workpiece material and hardness: Werkstückhärte 20CrMnTi HB180-223

Machining parameters v=220m/min

ap=0.5~1.0mm

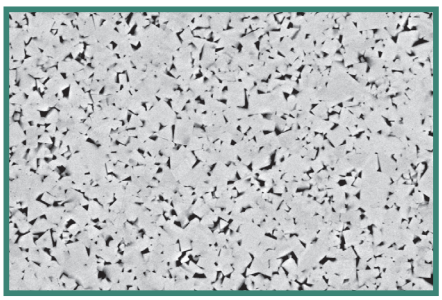
f=0.14mm/r



good chip control and surface · gute Spankontrolle und Oberfläche

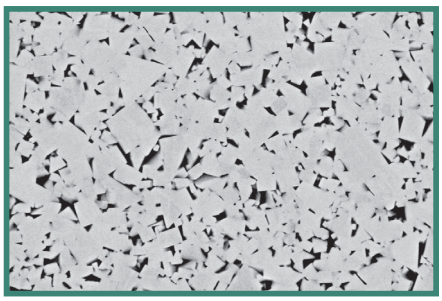
UNCOATED CARBIDE grade is widely used for non-ferrous and heat resistent material.

UNBESCHICHTETES HARTMETALL wird überwiegend für die Bearbeitung von NE-Metallen und warmfesten Legierungen eingesetzt.



Substrate of YD101 - the combination of cemented carbide phase WC of fine grain and bonding phase Co.

YD101 ist ein unbeschichtetes Hartmetall mit feiner Körnung, einer Hardphase aus WC Carbide und eine Bindephase aus Cobald (Kombination).



Substrate of YD 201 - the combination of cemented carbide phase WC of middle grain and bonding phase Co.

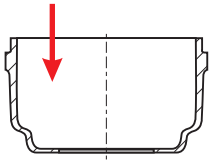
YD 201 ist ein unbeschichtetes Hartmetall mit mittlerer Korngröße, einer Hartphase aus WC Carbide und eine Bindephase aus Cobald.

Recommended Cutting Conditions · Empfohlene Schnittdaten

Workpiece Material Werkstückstoff		Application · Anwendung	Grade · Sorte	Recommended Cutting Speed m/min Schnittgeschwindigkeit m/min
P	Steel Stahl	Finishing Schlichten	YC10	130 - 360
		Roughing Schruppen	YC40	80 - 300
K	Cast Iron Gusseisen	Finishing Schlichten	YD051	100 - 170
		Semi-Finishing - Roughing Mittlere Bearbeitung -Schruppen	YD201	60 - 130
N	None-ferrite materials NE Metalle	Finishing· Semi-Finishing Schlichten· Mittlere Bearbeitung	YD101	110 -...
S	Heat-Resistant Steel Warmfester Stahl	Finishing Schlichten	YD101	20 - 50

Machining example · Bearbeitungsbeispiele

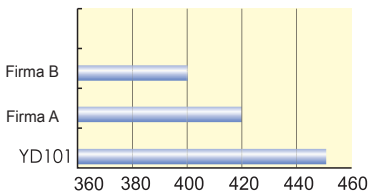
Example of Use
Bearbeitungsbeispiel



Insert· WSP: YD101·CCGX09T304-LH

Workpiece material and hardness·Werkstückstoff und Härte: ZL105 HB70

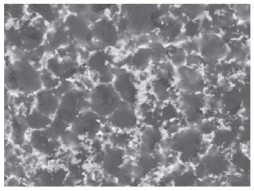
Machining parameters· Schnittdaten:
v=400m/min
ap=1mm
f=0.3mm/r

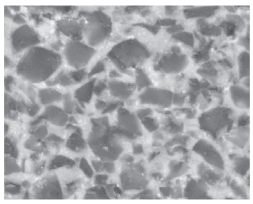


good shipcontroll and surface · gute Spankontrolle und Oberfläche

PCBN / PCD

Super-hard Cutting Material
Superharter Schneidstoff



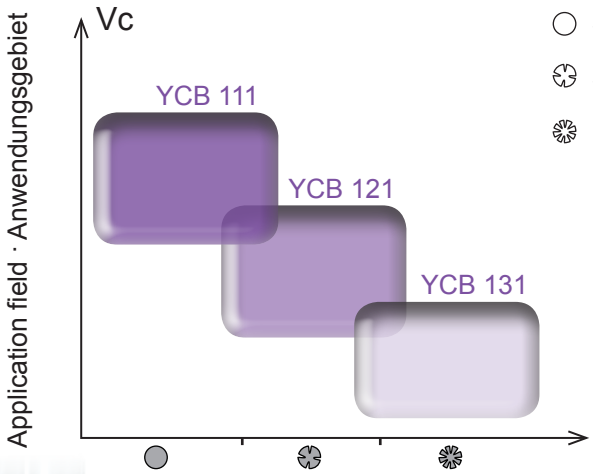


PCBN PCBN cubic boron nitride

PCBN with high hardness and good heat resistance for cutting of hardend steel (could be 1300°C), carbon steel, ball bearing steel, mould steel and high speed steel, grey cast iron, nodular graphite cast iron, chilled cast iron and Ni-based, Co-based, Cr-based and Fe-based high temperature alloy.

PCBN mit hoher Härte und Warmfestigkeit für die Bearbeitung bei hohen Temperaturen, z.B. 1300°C, bei der Bearbeitung von gehärtetem Stahl mit HRC von 50-60. Zur Bearbeitung von Stahl, Kugellagerstahl, Gussstahl, HSS, Grauguss, Kugelgraphitguss, Hartguss, Ni-, Fe-, Co-,Cr2- basis Superlegierungen.

Type · Typ	Grade Sorten	Application Anwendung	Characteristic Merkmale
Uncoted CBN Unbeschichtete CBN	**YCB111**	High speed continuous cutting vollschnitt bei hoher schnittgeschwindigkeit	Best wear resistance grade and suitable for high speed continuous cutting Verschleißfeste Sorte besonders geeignet für die Hochgeschwindigkeisbearbeitung im Vollschnitt
	YCB121	conitiuous and interrupted cutting (Light-Medium) Voll- und leicht unterbrochener Schnitt	Most suited for continuous and light interrupted high speed finishing due to heat resistant substrate. Durch sein bruchfestes Substrat die Universalsorte von niedriger bis hoher Schnittgeschnwindigkeit mit exzellenter Standzeit.
	YCB131	Interrupted cutting (Heavy) Stark unterbrochener Schnitt	CBN with higher fracture toughness, for interrupted cutting CBN mit exzellenter Bruchzähigkeit im stark unterbrochenen Schnitt.
	YCB211	Cast iron machining, Sintered matrials Gussbearbeitung,Sinkterwerkstoffe	First choice for high speed finishing of grey cast iron and sintered parts Erste Wahl zum Schlichten mit hohen Schnittgeschwindigkeiten im Guss und Sinterwerkstoffe.

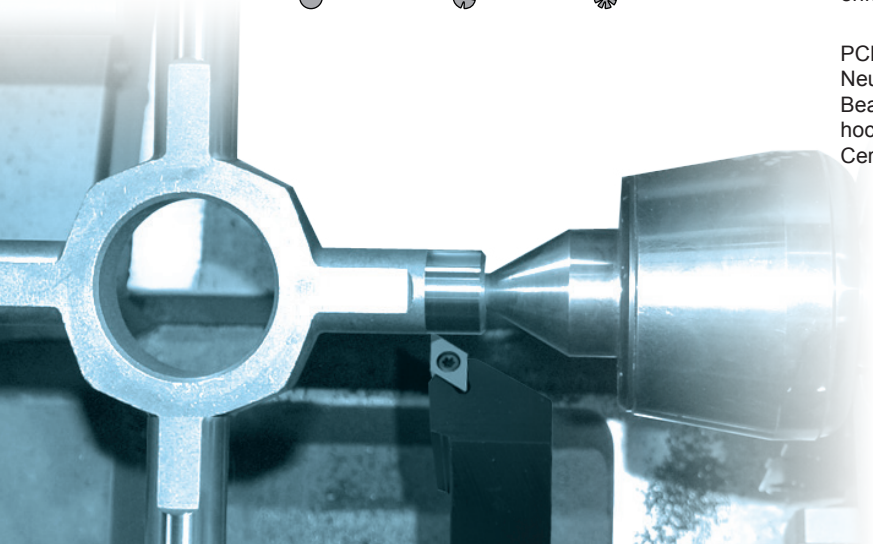


- Continuous cutting
  Vollschnitt
- Continuous and interrupted cutting
  Voll- und leicht unterbrochener Schnitt
- Interrupted cutting
  Stark unterbrochener Schnitt

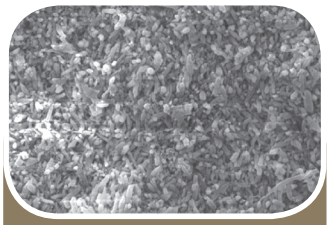
PCD PCD polycrystalline diamond
PCD polycrystaliner Diamand

PCD with high hardness, good wear resistance, low friction coefficient and good heat conductivity, which is appropriate for cutting of non-ferrous metal (such as Cu, Al, Mg and Ti high silicon alloy etc.) and nonmetal materials (such as glass fiber, cermet and enforced plastic etc.)

PCD mit hoher Härte guter Verschleißfähigkeit, und geringer Neugang zur Aufbauschneide, ist besonders geeignet für die Bearbeitung von NE-Metallen und (z.B. Cu, Al, Mg and Ti hochsilicium legierte Werkstoffen und Material wie Fiberglas, Cermets und verstärktes Plastik ect.



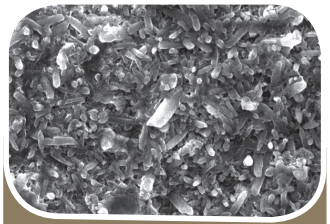




CN1000

CN1000 is Si3N4 ceramics grade. Optimal performance against cracking of cutting edge and thermal shocking. Suitable for finishing and semi-finishing of gray cast iron.

CN1000 ist eine Keramik von Si3N4. Optimale Eigenschaften gegen Schneidkantenbruch und dynamische Wärmebelastung. Geeignet zum Schlichten und zur mittleren Bearbeitung von Grauguss.



CN2000

CN2000 is Si3N4 ceramics grade with good wear-resistance and excellent toughness. Suitable for intermittent and continuous machining of grey cast iron, and Ni-based alloys.

CN2000 is Si3N4 Keramiksorte mit hoher Verschleißfestigkeit und ausgezeichneter Zähigkeit. Geeignet für die Bearbeitung von Grauguss mit und ohne Schnittunterbrechungen, sowie Ni-Superlegierungen.



CA1000

CA1000 is the mixed ceramics of Al203+TiCN. Good performance of wear resistance and safety cutting edge. Suitable for continuous machining of hardened steel and nodular cast iron.

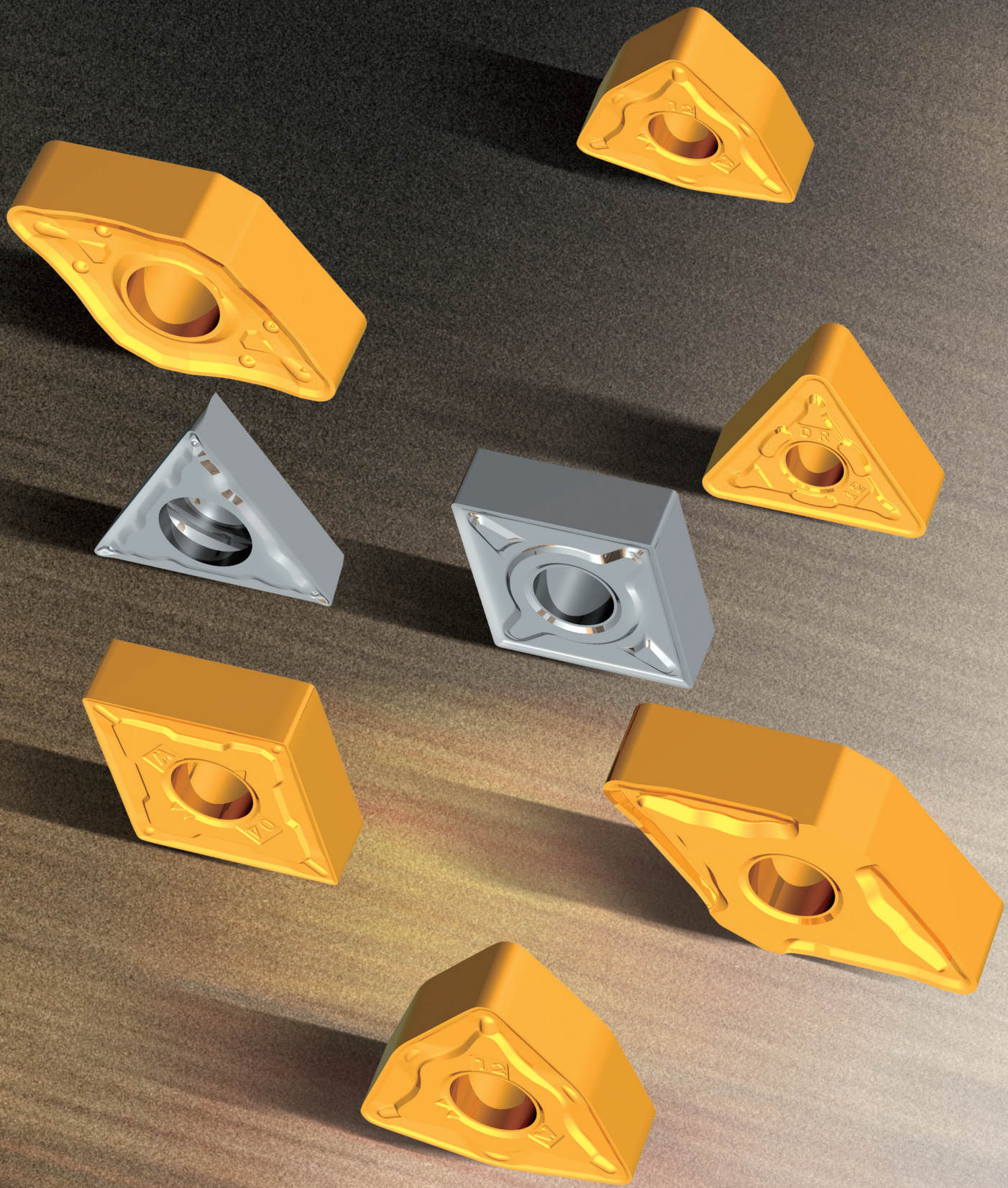
CA1000 ist die Mischkeramik von Al203+TiCN. Gute Verschleißfestigkeit und Bearbeitungssicherheit oder Zähigkeit. Es ist geeignet zur Bearbeitung von Kugelgraphitguss und gehärtetem Stahl.

Psychical properties · Physikalische Daten

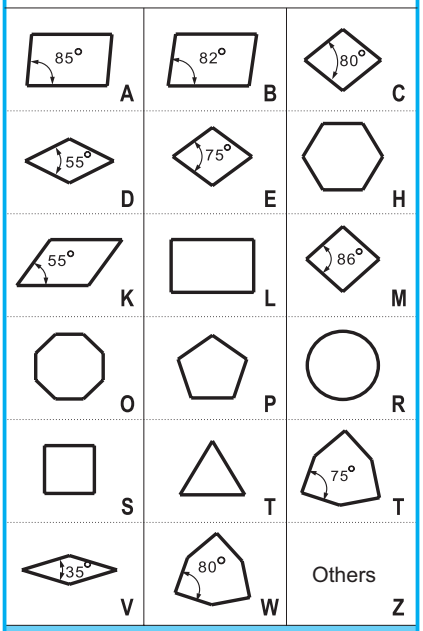
Grade Sorte	Density·Dichte (g/cm^3)	Hardness · Härte Hv(GPa)	Bending strength/ Biegebruchfestigkeit (MPa)	Fracture toughness Bruchzähigkeit ($MPa \cdot m^{1/2}$)
CA1000（Al_2O_3+TiCN）	4.2	19	⩾700	4.5
CN1000（Si_3N_4）	3.25	16	⩾900	7.5
CN2000（Si_3N_4）	3.25	16	⩾900	8

Recommended cutting condition · Empfohlene Schnittdaten

	Workpiece material Werkstückstoff	Application Anwendung	Cutting Speed Schnittgeschw. (m/min)	Feed rate Vorschub (mm/r)	Cutting depth Schnitttiefe (mm)
CA1000	Grey cast iron Malleable cast iron Grauguss	Roughing Schruppen	150-800	0.2-0.5	3.0-6.0
		Finishing Schlichten	200-1200	0.3-0.5	0.1-0.5
	Chilled cast iron Kokillenhartguss	Roughing Schruppen	30-100	0.1-0.2	0.5-1.5
		Finishing Schlichten	50-200	0.05-0.15	0.1-0.5
	Carbon steel, Alloy steel Ball bearing steel unlegierter Stahl, legierter Stahl, Kugellagerstahl	Roughing Schruppen	150-400	0.2-0.5	2.0-5.0
		Finishing Schlichten	200-800	0.05-0.20	0.1-0.5
	Hardened Steel Gehärteter Stahl	Roughing Schruppen	20-100	0.1-0.2	0.5-1.5
		Semi-finishing Mittlere Bearbeitung	40-200	0.05-0.50	0.1-0.5
		Finishing Schlichten	300-1200	0.05-0.30	0.1-0.5
CN1000	Grey cast iron Grauguss	Finishing Schlichten	150-1100	0.3-0.8	<5
		Finishing Schlichten	250-1200	0.15-0.4	<1
	Chilled cast iron Kokillenhartguss	Finishing Schlichten	20-250	0.2-0.8	<5
		Finishing Schlichten	60-450	0.1-0.6	<1
CN2000	Ni-based alloys, Ni-Superlegierungen	Finishing Schlichten	150-250	0.2-0.4	<5
		Finishing Schlichten	150-450	0.1-0.2	<1



Insert Shape / Schneidplattenform



Insert Shape / Schneidplattenform

Insert Type / *Plattentyp*

Metric / Metrisch

Code	Hole/ Bohrung	Chipbreaker/ Spanleitstufe	Insert Section/ Plattenform	Code	Hole/ Bohrung	Chipbreaker/ Spanleitstufe	Insert Section/ Plattenform
B	✔	----	> 65°	N	----	----	
H	✔	Single side/ einseitig	> 65°	R	----	Single side/ einseitig	
C	✔	----	> 65°	F	----	Double side/ doppelseitig	
J	✔	Double side/ doppelseitig	> 65°	A	✔	----	
W	✔	----	≤ 65°	M	✔	Single side/ einseitig	
T	✔	Single side/ einseitig	≤ 65°	G	✔	Double side/ doppelseitig	
Q	✔	----	≤ 65°	X	----	----	Special
U	✔	Double side/ doppelseitig	≤ 65°			----	

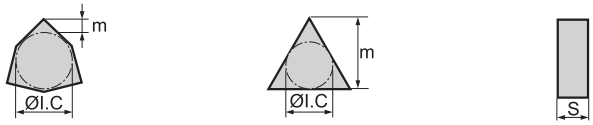
Insert Type /*Plattentyp*

T N M G

Clearance angle of main cutting edge *Freiwinkel der Hauptschneide*

Code	angle / *Winkel*	Code	angle / *Winkel*
A	3°	B	5°
C	7°	D	15°
E	20°	F	25°
G	30°	N	0°
P	11°	O	Others

Tolerances / *Toleranzklasse*



Code	Tolerance	Incircle Tolerance ØI.C	Tolerance S
A	±0.005	±0.025	±0.025
F	±0.005	±0.013	±0.025
C	±0.013	±0.025	±0.025
H	±0.013	±0.013	±0.025
E	±0.025	±0.025	±0.025
G	±0.025	±0.025	±0.13
J	±0.005	±0.05-±0.13	±0.025
K	±0.013	±0.05-±0.13	±0.025
L	±0.025	±0.05-±0.13	±0.025
M	±0.08-±0.18	±0.05-±0.13	±0.13
N	±0.08-±0.18	±0.05-±0.13	±0.025
U	±0.13-±0.38	±0.08-±0.25	±0.13

(Reference) M class precision (according to shape and size) (mm)

incircle	regular triangle	square	80° rhomboid	55° rhomboid	35° rhomboid	round runde
6.35	±0.08	±0.08	±0.08	±0.11	±0.16	---
9.525	±0.08	±0.08	±0.08	±0.11	±0.16	---
12.7	±0.13	±0.13	±0.13	±0.15	---	---
15.875	±0.15	±0.15	±0.15	±0.18	---	---
19.05	±0.15	±0.15	±0.15	±0.18	---	---
25.4	---	±0.18	---	---	---	---

ØI.C (mm) Incircle tolerance

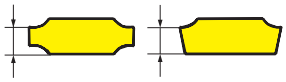
incircle	regular triangle	square	80° rhomboid	55° rhomboid	35° rhomboid	round runde
6.35	±0.05	±0.05	±0.05	±0.05	±0.05	---
9.525	±0.05	±0.05	±0.05	±0.05	±0.05	±0.05
12.7	±0.08	±0.08	±0.08	±0.08	---	±0.08
15.875	±0.10	±0.10	±0.10	±0.10	---	±0.10
19.05	±0.10	±0.10	±0.10	±0.10	---	±0.10
25.4	---	±0.13	---	---	---	±0.13

Cutting edge length / *Schneidenlänge (mm)*

Ø of IC (mm)	Insert Shape/ Plattenform							
	C	D	R	S	T	V	W	K
3.97					06			
5.0			05					
5.56					09			
6.0			06					
6.35	06	07			11	11		
8.0			08					
9.525	09	11	09	09	16	16	06	16
10.0			10					
12.0			12					
12.7	12	15	12	12	22	22	08	
15.875	16		15	15	27			
16.0		19	16					
19.05	19		19	19	33			
20.0			20					
25.0	25	25	25					
25.4			25	25				
31.75			31					
32			32					

Insert thickness / *Dicke* (mm)

Thickness / Dicke



Code	Insert thickness (mm)
00	0.79
T0	0.99
01	1.59
T1	1.98
02	2.38
T2	2.58
03	3.18
T3	3.97
04	4.76
T4	4.96
05	5.96
T5	5.95
06	6.35
T6	6.75
07	7.94
09	9.52
T9	9.72
11	11.11
12	12.70

22 04 08 - DM (ISO)

4 3 2 (inch)

Incircle Innenkreis

code	diameter (mm)
2	6.35
3	9.525
4	12.7
5	15.875
6	19.05
8	25.4

Thickness *Dicke*

code	thickness (mm)
2	3.18
3	4.76
4	6.35
5	7.94
6	9.52

Nose radius *Eckenradius*

code	Nose radius (mm)
0	0.2
1	0.4
2	0.8
3	1.2
4	1.6
5	2.0
6	2.4

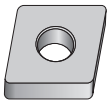
Nose radius *Eckenradius*

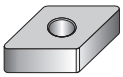
code	Radius (mm)
00	no Radius
02	0.2
04	0.4
08	0.8
12	1.2
16	1.6
20	2.0
24	2.4
32	3.2
X	Others
MO	Round Inserts Runde Platten

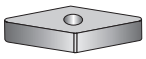
Code Chipbreakers *Spanleitstufen*

DF	**DM**	**DR**
		
HF	**HM**	**HR**
		
EF	**EM**	**ER**
		
NF	**NM**	**SF**
		
PM	**HR**	**WG**
		

Metric and britain system comparison list of general turning insert/ Vergleichstabelle für allgemeine Drehwendeschneidplatten (Metrisch / Britain System)

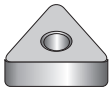
C Type Negative angle/ WSP	(ISO)	(Inch)	Chipbreaker/ Spanleitstufe
Insert shape 	090304	321	-DF -WG -SF -EF -NF -PM -DM -EM -NM -DR -ER -HDR
	090308	322	
	120404	431	
	120408	432	
	120412	433	
	120416	434	
	160608	542	
	160612	543	
	160616	544	
	190608	642	
	190612	643	
	190616	644	
	190624	646	
	250724	856	
	250732	858	
	250924	866	
	250932	868	

D Type Negative angle/ WSP	(ISO)	(Inch)	Chipbreaker/ Spanleitstufe
Insert shape 	110404	331	-DF -WG -SF -NF -PM -DM -EM -NM -DR -ER -HDR
	110408	332	
	110412	333	
	150404	431	
	150408	432	
	150412	433	
	150604	441	
	150608	442	
	150612	443	
	150616	444	
	190608	542	
	190612	543	

V Type Negative angle/ WSP	(ISO)	(Inch)	Chipbreaker/ Spanleitstufe
Insert shape 	160404	331	-DF -EF -SF -NF -PM -DM -EM -NM
	160408	332	
	160412	333	

R Type Negative angle/ WSP	(ISO)	(Inch)	Chipbreaker/ Spanleitstufe
Insert shape 	0903MO	32	
	1204MO	43	

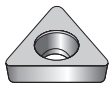
W Type Negative angle/ WSP	(ISO)	(Inch)	Chipbreaker/ Spanleitstufe
Insert shape 	06T304	3(2.5)1	-DF -WG -SF -EF -NF -PM -DM -EM -NM -DR
	06T308	3(2.5)2	
	06T312	3(2.5)3	
	060404	331	
	060408	332	
	060412	333	
	080404	431	
	080408	432	
	080412	433	

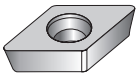
T Type Negative angle/ WSP	(ISO)	(Inch)	Chipbreaker/ Spanleitstufe
Insert shape 	113304	221	-DF -WG -SF -EF -PM -DM -EM -DR -ER -HDR
	110308	222	
	160404	331	
	160408	332	
	160412	333	
	220404	431	
	220408	432	
	220412	433	
	220416	434	
	270608	542	
	270612	543	
	270616	544	

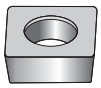
S Type Negative angle/ WSP	(ISO)	(Inch)	Chipbreaker/ Spanleitstufe
Insert shape 	090304	321	-DF -SF -EF -PM -DM -EM -NM -DR -ER -HDR
	090308	322	
	090312	323	
	120404	431	
	120408	432	
	120412	433	
	120416	434	
	150608	542	
	150612	543	
	150616	544	
	190412	633	
	190424	636	
	190612	643	
	190616	644	
	250724	856	
	250732	858	
	250924	866	
	250932	868	

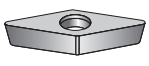
Metric and britain system comparison list of general turning insert/ Vergleichstabelle für allgemeine Drehwendeschneidplatten (Metrisch / Britain System)

C Type Positive angle/ WSP	(ISO)	(Inch)	Chipbreaker/ Spanleitstufe
Insert shape 	060202	2(1.5)0	-SF -HF -EF -HM -EM -HR -LH
	060204	2(1.5)1	
	060208	2(1.5)2	
	09T302	3(2.5)0	
	09T304	3(2.5)1	
	09T308	3(2.5)2	
	120404	431	
	120408	432	
	120412	433	

T Type Positive angle/ WSP	(ISO)	(Inch)	Chipbreaker/ Spanleitstufe
Insert shape 	06T102	1.2(1.2)0	-SF -HF -EF -HM -EM -HR -LH
	06T104	1.2(1.2)1	
	06T108	1.2(1.2)2	
	090202	1.8(1.5)0	
	090204	1.8(1.5)1	
	090208	1.8(1.5)2	
	110202	2(1.5)0	
	110204	2(1.5)1	
	110208	2(1.5)2	
	110302	220	
	110304	221	
	110308	222	
	16T302	30	
	16T304	31	
	16T308	32	
	16T312	33	
	160400	330	
	220408	432	
	220412	433	
	220416	434	
	270408	532	
	270412	533	
	330612	643	
	330616	644	

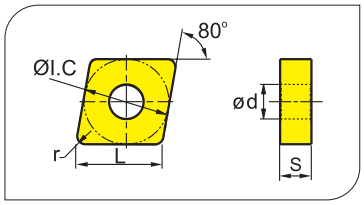
D Type Positive angle/ WSP	(ISO)	(Inch)	Chipbreaker/ Spanleitstufe
Insert shape 	070202	2(1.5)0	-SF -HF -EF -HM -EM -HR -LH
	070204	2(1.5)1	
	070208	2(1.5)2	
	11T302	3(2.5)0	
	11T304	3(2.5)1	
	11T308	3(2.5)2	
	11T312	3(2.5)3	

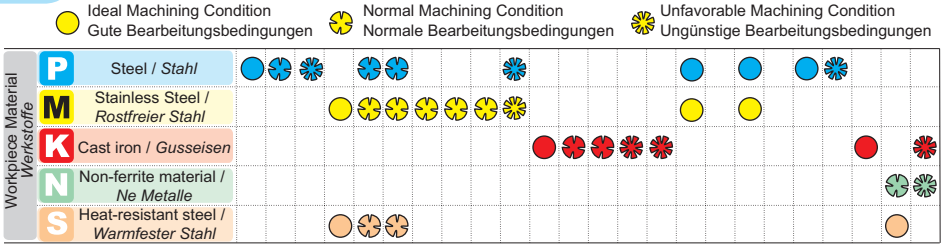
S Type Positive angle/ WSP	(ISO)	(Inch)	Chipbreaker/ Spanleitstufe
Insert shape 	060204	2(1.5)1	-HF -EF -HM -EM -HR -LH
	09T302	3(2.5)0	
	09T304	3(2.5)1	
	09T308	3(2.5) 2	
	120404	431	
	120408	432	
	120412	433	
	150404	531	
	150408	532	
	150412	533	
	190408	632	
	190412	633	
	190416	634	

V Type Positive angle/ WSP	(ISO)	(Inch)	Chipbreaker/ Spanleitstufe
Insert shape 	110202	2(1.5)0	-SF -HF -NF -LH
	110204	2(1.5)1	
	110208	2(1.5)2	
	110302	220	
	110304	221	
	110308	222	
	160402	330	
	160404	331	
	160408	332	
	160412	333	

A

CN** Negative Insert · Negative WSP

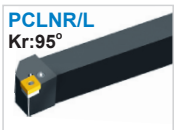




Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall													Cermet unbeschichtet	Cermet Coated beschicht. Cerm.	Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151	YNG151C	YC10	YC40	YD051	YD101	YD201
DF  Finishing Schlichten	**CNMG090304-DF**	9.7	9.525	3.18	3.81	0.4	●				○											○						
	CNMG090308-DF	9.7	9.525	3.18	3.81	0.8	●															○						
	CNMG120404-DF	12.9	12.7	4.76	5.16	0.4	●	●	○		○		○	○	○				○			●	●					
	CNMG120408-DF	12.9	12.7	4.76	5.16	0.8	●	●	○				○	○	○		○					●						
	CNMG120412-DF	12.9	12.7	4.76	5.16	1.2	●	○							○													
WG  Wiper	**CNMG120404-WG**	12.9	12.7	4.76	5.16	0.4	●	○																				
	CNMG120408-WG	12.9	12.7	4.76	5.16	0.8	●	●			○			○			○			●								
	CNMG120412-WG	12.9	12.7	4.76	5.16	1.2	●	●			○			○														
	CNMG160608-WG	16.1	15.875	6.35	6.35	0.8		○																				
	CNMG160612-WG	16.1	15.875	6.35	6.35	1.2		○																				
SF  Finishing Schlichten	**CNMG090304-SF**	9.7	9.525	3.18	3.81	0.4																○	●					
	CNMG090308-SF	9.7	9.525	3.18	3.81	0.8																○	●					
	CNMG120404-SF	12.9	12.7	4.76	5.16	0.4																○	●					
	CNMG120408-SF	12.9	12.7	4.76	5.16	0.8																○	●					
	CNMG120412-SF	12.9	12.7	4.76	5.16	1.2																	●					
EF  Finishing Schlichten	**CNMG090304-EF**	9.7	9.525	3.18	3.81	0.4					●	○																
	CNMG090308-EF	9.7	9.525	3.18	3.81	0.8					●	○																
	CNMG120404-EF	12.9	12.7	4.76	5.16	0.4		●			●	○		●	●													
	CNMG120408-EF	12.9	12.7	4.76	5.16	0.8	○	●			●	●	○	●	●													
	CNMG120412-EF	12.9	12.7	4.76	5.16	1.2					●	○	○	●	●													

Tool holder / Klemmhalter


PCBNR/L
Kr:75°


PCLNR/L
Kr:95°


MCBNR/L
Kr:75°


MCLNR/L
Kr:95°

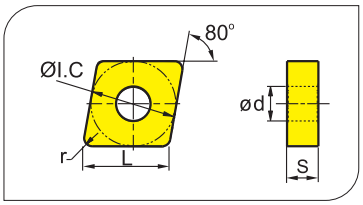

PCLNR/L
Kr:95°

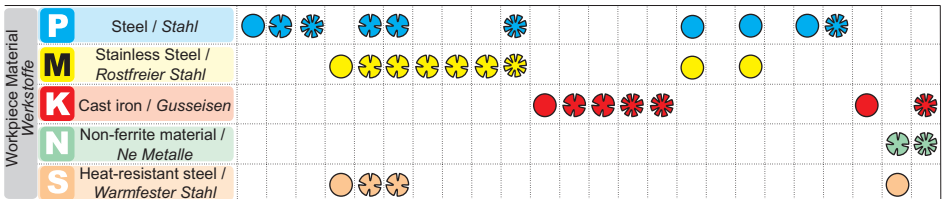
Page Seite A158 A159 A170 A171 A216

● Ex Stock / ab Lager ○ On demand / auf Anfrage

CN** Negative Insert·Negative WSP

Ideal Machining Condition / Gute Bearbeitungsbedingungen
Normal Machining Condition / Normale Bearbeitungsbedingungen
Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen

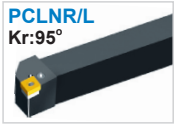




Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall												Cermet unbeschichtet		Cermet Coated beschicht. Cerm.		Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151		YNG151C		YC10	YC40	YD051	YD101	YD201
NF  Finishing Schlichten	**CNEG120404-NF**	12.9	12.7	4.76	5.16	0.4				●																		○	
	CNEG120408-NF	12.9	12.7	4.76	5.16	0.8				●																		○	
	CNEG120412-NF	12.9	12.7	4.76	5.16	1.2				○																		○	
PM  Medium Cut/ Mittl. Bearb.	**CNMG090304-PM**	9.7	9.525	3.18	3.81	0.4		●																					
	CNMG090308-PM	9.7	9.525	3.18	3.81	0.8		●																					
	CNMG120404-PM	12.9	12.7	4.76	5.16	0.4	●	●							○			●		●									
	CNMG120408-PM	12.9	12.7	4.76	5.16	0.8	●	●							○		●	●	●	●	○								○
	CNMG120412-PM	12.9	12.7	4.76	5.16	1.2	●	●							○		●	●		●	●								
	CNMG120416-PM	12.9	12.7	4.76	5.16	1.6	○	●									●	●		●	○								
	CNMG160608-PM	16.1	15.875	6.35	6.35	0.8		●									○	○		○									
	CNMG160612-PM	16.1	15.875	6.35	6.35	1.2	○	●									○	●	○	●	○								
	CNMG160616-PM	16.1	15.875	6.35	6.35	1.6	○	●									○	○		○									
	CNMG190608-PM	19.3	19.05	6.35	7.94	0.8		●									○												
	CNMG190612-PM	19.3	19.05	6.35	7.94	1.2		●									○	○		●									
	CNMG190616-PM	19.3	19.05	6.35	7.94	1.6		●									○	○		○									

Tool holder / Klemmhalter


PCBNR/L Kr:75°


PCLNR/L Kr:95°


MCBNR/L Kr:75°

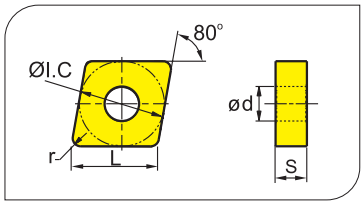

MCLNR/L Kr:95°

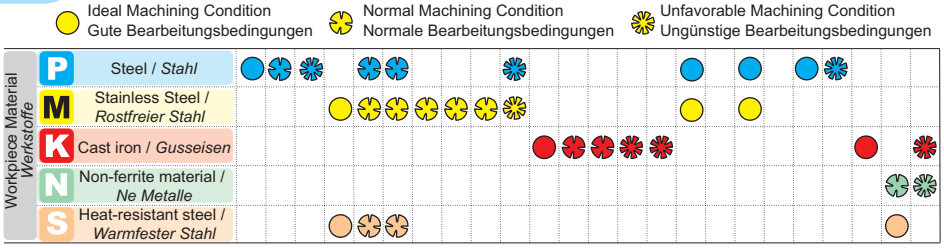

PCLNR/L Kr:95°

Page Seite A158 A159 A170 A171 A216

Insert code key ISO Code A42-A43
Grade selection reference Sortenauswahl A14/A31-A40
chip breaker selection reference Spanbrecherauswahl A24-A30
Recommended cutting parameters Empfohlene Schnittparameter A249-A253

CN** Negative Insert·Negative WSP





Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall													Cermet unbeschichtet	Cermet Coated beschicht. Cerm.	Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151	YNG151C	YC10	YC40	YD051	YD101	YD201
DM	CNMG090304-DM	9.7	9.525	3.18	3.81	0.4	●	●							○							●						
	CNMG090308-DM	9.7	9.525	3.18	3.81	0.8		●							○													
	CNMG120404-DM	12.9	12.7	4.76	5.16	0.4	●	●	●		○		○	●	●							●						
	CNMG120408-DM	12.9	12.7	4.76	5.16	0.8	●	●	●		●		○	●	●				○			○						●
	CNMG120412-DM	12.9	12.7	4.76	5.16	1.2	●	●	●					○	●				○			●						
	CNMG120416-DM	12.9	12.7	4.76	5.16	1.6		●	○						○				○									
	CNMG160608-DM	16.1	15.875	6.35	6.35	0.8	●	●	●						●				○									
	CNMG160612-DM	16.1	15.875	6.35	6.35	1.2	●	●	○						○													
	CNMG160616-DM	16.1	15.875	6.35	6.35	1.6	●	●	●						○													
	CNMG190608-DM	19.3	19.05	6.35	7.94	0.8		●							●													
	CNMG190612-DM	19.3	19.05	6.35	7.94	1.2		●	●						●													
	CNMG190616-DM	19.3	19.05	6.35	7.94	1.6		●	○						●													
EM	CNMG120404-EM	12.9	12.7	4.76	5.16	0.4					●	●	●		●													
	CNMG120408-EM	12.9	12.7	4.76	5.16	0.8					●	●	●	●	●													
	CNMG120412-EM	12.9	12.7	4.76	5.16	1.2					●		○		●													
	CNMG160608-EM	16.1	15.875	6.35	6.35	0.8							●															
	CNMG160612-EM	16.1	15.875	6.35	6.35	1.2					●		○															
	CNMG160616-EM	16.1	15.875	6.35	6.35	1.6							○															

Medium Cut/ Mittl. Bearb.

Medium Cut/ Mittl. Bearb.

Tool holder / Klemmhalter









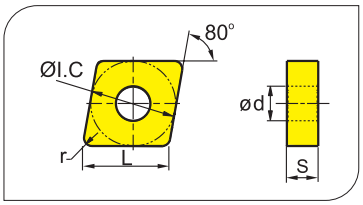


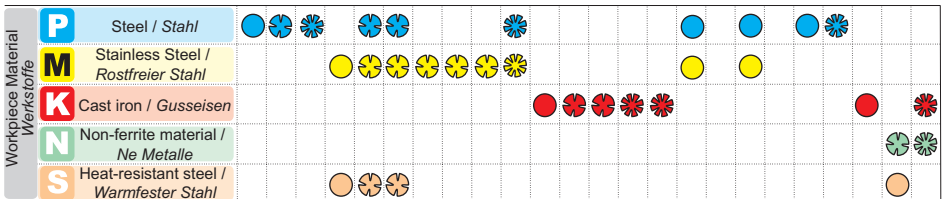
Page/Seite A158 A159 A170 A171 A216

● Ex Stock / ab Lager ○ On demand / auf Anfrage

CN** Negative Insert·Negative WSP

Ideal Machining Condition / Gute Bearbeitungsbedingungen
Normal Machining Condition / Normale Bearbeitungsbedingungen
Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen

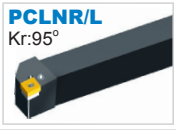




Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall												Cermet unbeschichtet	Cermet Coated beschicht. Cerm.	Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151	YNG151C	YC10	YC40	YD051	YD101	YD201
NM	CNMG120404-NM	12.9	12.7	4.76	5.16	0.4																					
	CNMG120408-NM	12.9	12.7	4.76	5.16	0.8				●																	○
	CNMG120412-NM	12.9	12.7	4.76	5.16	1.2				●																	
Medium Cut/ Mittl. Bearb.																											
DR	CNMG120408-DR	12.9	12.7	4.76	5.16	0.8	●	●	●						○			●		●							
	CNMG120412-DR	12.9	12.7	4.76	5.16	1.2	●	●	●								●	●		●							
	CNMG120416-DR	12.9	12.7	4.76	5.16	1.6	●	●	●									●		●							
	CNMG160608-DR	16.1	15.875	6.35	6.35	0.8		●										●		○							
	CNMG160612-DR	16.1	15.875	6.35	6.35	1.2	●	●	●									○		●							
	CNMG160616-DR	16.1	15.875	6.35	6.35	1.6	●	●	●									○		○							
	CNMG190608-DR	19.3	15.875	6.35	7.94	0.8		●										●		●							
	CNMG190612-DR	19.3	19.05	6.35	7.94	1.2	●	●	●									○		●							
	CNMG190616-DR	19.3	19.05	6.35	7.94	1.6	●	●	●									●		●							
	CNMG190624-DR	19.3	19.05	6.35	7.94	2.4	●	●	●									○		○							

Tool holder / Klemmhalter









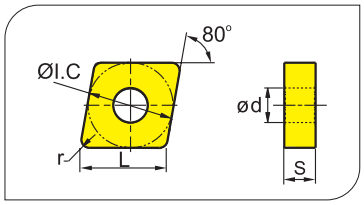


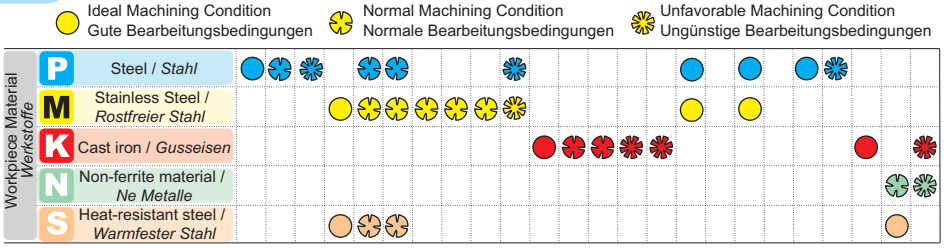
Page/Seite A158 A159 A170 A171 A216

Insert code key ISO Code A42-A43
Grade selection reference Sortenauswahl A14/A31-A40
chip breaker selection reference Spanbrecherauswahl A24-A30
Recommended cutting parameters Empfohlene Schnittparameter A249-A253

A

CN** Negative Insert · Negative WSP





Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall													Cermet unbeschichtet	Cermet Coated beschicht. Cerm.	Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151	YNG151C	YC10	YC40	YD051	YD101	YD201
DR	CNMM120412-DR	12.9	12.7	4.76	5.16	1.2	●	●																			
	CNMM160612-DR	16.1	15.875	6.35	6.35	1.2	○	●	○																		
	CNMM160616-DR	16.1	15.875	6.35	6.35	1.6	●	●	●						●												
	CNMM190612-DR	19.3	19.05	6.35	7.94	1.2	●	●	●																		
	CNMM190616-DR	19.3	19.05	6.35	7.94	1.6	○	●	●																		
	CNMM190624-DR	19.3	19.05	6.35	7.94	2.4	●	●	○																		
	CNMM250924-DR	25.79	25.4	9.525	9.12	2.4	○	●	○																		
ER	CNMG120408-ER	12.9	12.7	4.76	5.16	0.8								●													
	CNMG120412-ER	12.9	12.7	4.76	5.16	1.2								●													
	CNMG160612-ER	16.1	15.875	6.35	6.35	1.2								●													
	CNMG160616-ER	16.1	15.875	6.35	6.35	1.6								●													
	CNMG190612-ER	19.3	19.05	6.35	7.94	1.2						○		●													
	CNMG190616-ER	19.3	19.05	6.35	7.94	1.6								●													
ER	CNMM250724-ER	25.79	25.4	7.94	9.12	2.4		○						○		○											
	CNMM250732-ER	25.79	25.4	7.94	9.12	3.2		○						○		○											
	CNMM250924-ER	25.79	25.4	9.525	9.12	2.4		○						○		○											
	CNMM250932-ER	25.79	25.4	9.525	9.12	3.2		○						○		○											
HDR	CNMM120408-HDR	12.9	12.7	4.76	5.16	0.8	●	●	●						●				○								
	CNMM120412-HDR	12.9	12.7	4.76	5.16	1.2	○	●	●						○												
	CNMM120416-HDR	12.9	12.7	4.76	5.16	1.6		●	●																		
	CNMM160612-HDR	16.1	15.875	6.35	6.35	1.2	●	●	○						○												
	CNMM160616-HDR	16.1	15.875	6.35	6.35	1.6	○	●	●																		
	CNMM190616-HDR	19.3	19.05	6.35	7.94	1.6	●	●	●																		
	CNMM190624-HDR	19.3	19.05	6.35	7.94	2.4	●	●																			

Roughing / Schruppen

Tool holder / Klemmhalter


PCBNR/L Kr:75°


PCLNR/L Kr:95°


MCBNR/L Kr:75°

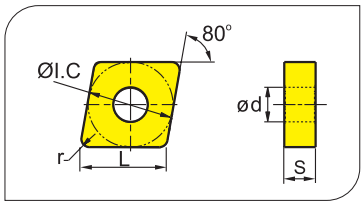

MCLNR/L Kr:95°

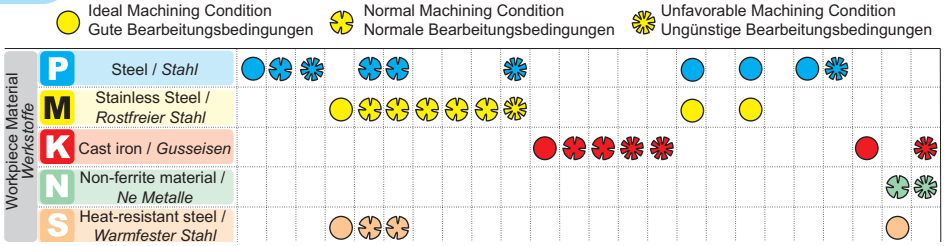

PCLNR/L Kr:95°

Page/Seite A158 A159 A170 A171 A216

● Ex Stock / ab Lager ○ On demand / auf Anfrage

CN** Negative Insert·Negative WSP





Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall												Cermet unbeschichtet		Cermet Coated beschicht. Cerm.		Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151		YNG151C		YC10	YC40	YD051	YD101	YD201
Flat	CNMA120404	12.9	12.7	4.76	5.16	0.4	○										●	○	○										●
	CNMA120408	12.9	12.7	4.76	5.16	0.8	○										●	●	○	●								○	●
	CNMA120412	12.9	12.7	4.76	5.16	1.2	○										●	●	○	●									●
	CNMA120416	12.9	12.7	4.76	5.16	1.6											●	●	○	●									
	CNMA160608	16.1	15.875	6.35	6.35	0.8											○		○	○									
	CNMA160612	16.1	15.875	6.35	6.35	1.2											○	●	○	○									
	CNMA160616	16.1	15.875	6.35	6.35	1.6											●	●	○	●									
	CNMA160620	16.1	15.875	6.35	6.35	2.0													○	○									
	CNMA160630	16.1	15.875	6.35	6.35	3.0												○	○										
	CNMA190612	19.3	19.05	6.35	7.94	1.2	○										●	●	●	●								○	
	CNMA190616	19.3	19.05	6.35	7.94	1.6											○	●	●	●									
Basic	CNMG120404	12.9	12.7	4.76	5.16	0.4	○	●																					
	CNMG120408	12.9	12.7	4.76	5.16	0.8	○	●			○															●	○		○
	CNMG120412	12.9	12.7	4.76	5.16	1.2	○	●	○																				○
	CNMG160608	16.1	15.875	6.35	6.35	0.8	○	○																					
	CNMG160612	16.1	15.875	6.35	6.35	1.2		○																					
	CNMG160616	16.1	15.875	6.35	6.35	1.6																							
	CNMG190608	19.3	19.05	6.35	7.94	0.8		○																					
	CNMG190612	19.3	19.05	6.35	7.94	1.2	○	○																					
	CNMG190616	19.3	19.05	6.35	7.94	1.6		○											○										

Tool holder / Klemmhalter


PCBNR/L
Kr:75°


PCLNR/L
Kr:95°


MCBNR/L
Kr:75°

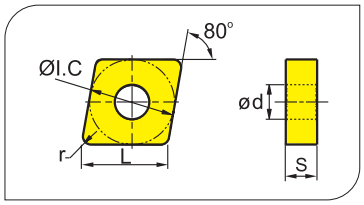

MCLNR/L
Kr:95°

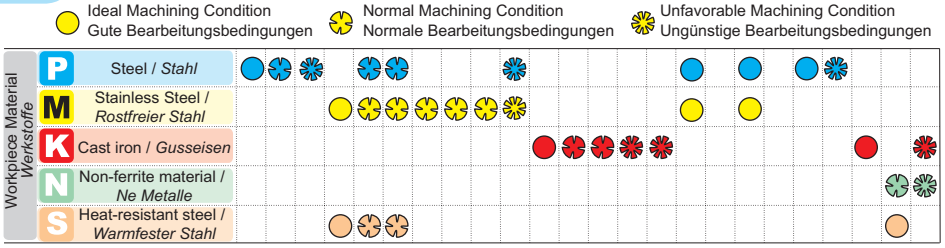

PCLNR/L
Kr:95°

Page/Seite A158 A159 A170 A171 A216

Insert code key ISO Code A42-A43
Grade selection reference Sortenauswahl A14/A31-A40
chip breaker selection reference Spanbrecherauswahl A24-A30
Recommended cutting parameters Empfohlene Schnittparameter A249-A253

CN** Negative Insert·Negative WSP

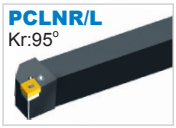




Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall												Cermet unbeschichtet		Cermet Coated beschicht. Cerm.		Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151		YNG151C		YC10	YC40	YD051	YD101	YD201
Basic 	**CNMM120404**	12.9	12.7	4.76	5.16	0.4	○	○																					
	CNMM120408	12.9	12.7	4.76	5.16	0.8	○	○																					
	CNMM120412	12.9	12.7	4.76	5.16	1.2																							
	CNMM190608	19.3	19.05	6.35	7.94	0.8																							
	CNMM190612	19.3	19.05	6.35	7.94	1.2		○	○																				
	CNMM190616	19.3	19.05	6.35	7.94	1.6		○	○																				
	CNMM190624	19.3	19.05	6.35	7.94	2.4			○																				

Tool holder / Klemmhalter


PCBNR/L
Kr:75°


PCLNR/L
Kr:95°


MCBNR/L
Kr:75°


MCLNR/L
Kr:95°


PCLNR/L
Kr:95°

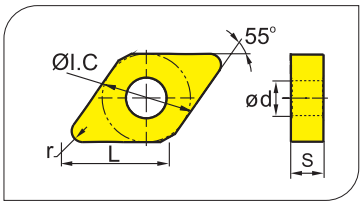
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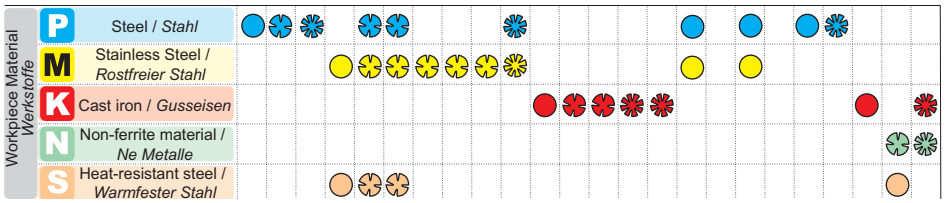
● Ex Stock / ab Lager ○ On demand / auf Anfrage

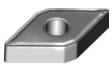
A

VN** Negative Insert·Negative WSP

Ideal Machining Condition / Gute Bearbeitungsbedingungen
Normal Machining Condition / Normale Bearbeitungsbedingungen
Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen





Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall													Cermet unbeschichtet	Cermet Coated beschicht. Cerm.	Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151	YNG151C	YC10	YC40	YD051	YD101	YD201
DF  Finishing Schlichten	DNMG110404-DF	11.6	9.525	4.76	3.81	0.4	○	●			●			○	○							●						
	DNMG110408-DF	11.6	9.525	4.76	3.81	0.8	●	●						○	○													
	DNMG110412-DF	11.6	9.525	4.76	3.81	1.2	○	○																				
	DNMG150404-DF	15.5	12.7	4.76	5.16	0.4	●	○						○					○			○						
	DNMG150408-DF	15.5	12.7	4.76	5.16	0.8	●	○						○														
	DNMG150412-DF	15.5	12.7	4.76	5.16	1.2	○																					
	DNMG150604-DF	15.5	12.7	6.35	5.16	0.4	●	●			○		○	●								●						
	DNMG150608-DF	15.5	12.7	6.35	5.16	0.8	●	●					○															
	DNMG150612-DF	15.5	12.7	6.35	5.16	1.2	●																					
 Wiper	DNMX110404-WG	11.6	9.525	4.76	3.81	0.4	●																					
	DNMX110408-WG	11.6	9.525	4.76	3.81	0.8	○	○			○			○														
	DNMX150408-WG	15.5	12.7	4.76	5.16	0.8	●	○						○														
	DNMX150412-WG	15.5	12.7	4.76	5.16	1.2																						
	DNMX150608-WG	15.5	12.7	6.35	5.16	0.8	●	●			○			○														
	DNMX150612-WG	15.5	12.7	6.35	5.16	1.2	●	○										○										
SF  Finishing Schlichten	DNMG110404-SF	11.6	9.525	4.76	3.81	0.4																	●					
	DNMG150404-SF	15.5	12.7	4.76	5.16	0.4																	●					
	DNMG150408-SF	15.5	12.7	4.76	5.16	0.8																	●					
	DNMG150604-SF	15.5	12.7	6.35	5.16	0.4																	●					
	DNMG150608-SF	15.5	12.7	6.35	5.16	0.8																	●					

Tool holder / Klemmhalter











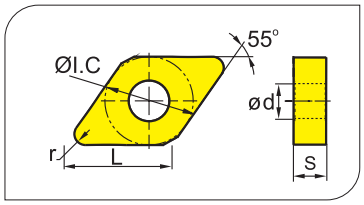


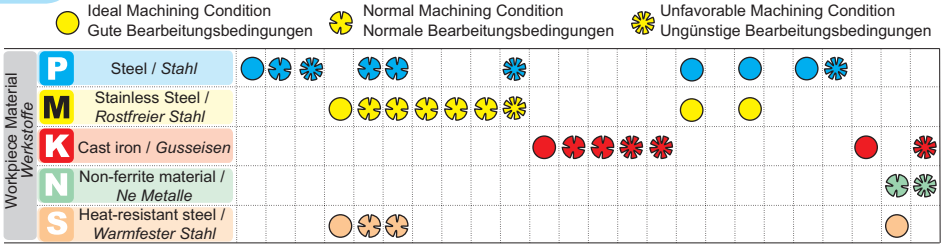
Page/Seite A160 A161 A172 A173 A218 A219

Insert code key ISO Code A42-A43
Grade selection reference Sortenauswahl A14/A31-A40
chip breaker selection reference Spanbrecherauswahl A24-A30
Recommended cutting parameters Empfohlene Schnittparameter A249-A253

A

DN** Negative Insert·Negative WSP





Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall												Cermet unbeschichtet		Cermet Coated beschicht. Cerm.	Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151	YNG151C	YC10	YC40	YD051	YD101	YD201
EF Finishing Schlichten	**DNMG110404-EF**	11.6	9.525	4.76	3.81	0.4					●	○		●													
	DNMG110408-EF	11.6	9.525	4.76	3.81	0.8					●	○		●													
	DNMG110412-EF	11.6	9.525	4.76	3.81	1.2						○															
	DNMG150404-EF	15.5	12.7	4.76	5.16	0.4					●	○															
	DNMG150408-EF	15.5	12.7	4.76	5.16	0.8					●	○															
	DNMG150412-EF	15.5	12.7	4.76	5.16	1.2						○															
	DNMG150604-EF	15.5	12.7	6.35	5.16	0.4		●			●	●		●	●												
	DNMG150608-EF	15.5	12.7	6.35	5.16	0.8		●			●	●		●	●												
	DNMG150612-EF	15.5	12.7	6.35	5.16	1.2					●																
NF finishing Schlichten	**DNEG150404-NF**	15.5	12.7	4.76	5.16	0.4																					
	DNEG150408-NF	15.5	12.7	4.76	5.16	0.8																					
	DNEG150604-NF	15.5	12.7	6.35	5.16	0.4				●																	○
	DNEG150608-NF	15.5	12.7	6.35	5.16	0.8				●																	○
FM finishing Schlichten	**DNMG150604R-FM**	15.5	12.7	6.35	5.16	0.4	○	●				●		○													
	DNMG150608R-FM	15.5	12.7	6.35	5.16	0.8	○	●				●		○													
	DNMG150604L-FM	15.5	12.7	6.35	5.16	0.4	○	●				●		○													
	DNMG150608L-FM	15.5	12.7	6.35	5.16	0.8	○	●				●		○													
PM Medium Cut/ Mittl. Bearb.	**DNMG110404-PM**	11.6	9.525	4.76	3.81	0.4	●	●	○								●										
	DNMG110408-PM	11.6	9.525	4.76	3.81	0.8	●	●	○							●	●										
	DNMG110412-PM	11.6	9.525	4.76	3.81	1.2	●	●								●	●										
	DNMG150404-PM	15.5	12.7	4.76	5.16	0.4	○	●									○	●									
	DNMG150408-PM	15.5	12.7	4.76	5.16	0.8	○	●								○	●	●									

Tool holder / Klemmhalter


PDJNR/L
Kr:93°


PDNNR/L
Kr:63°


MDJNR/L
Kr:93°


MDPNN
Kr:62°30'


PDSNR/L
Kr:62°30'

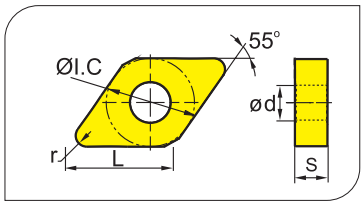

PDUNR/L
Kr:93°

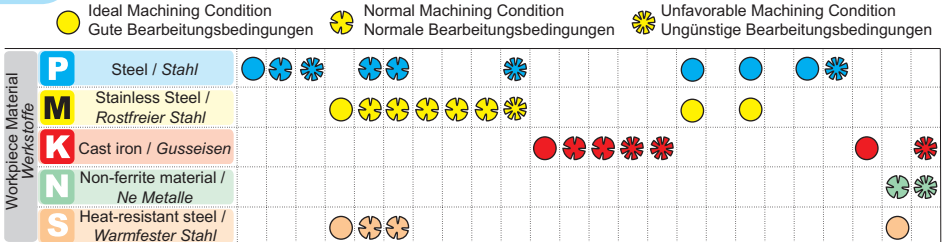
Page/Seite A160 A161 A172 A173 A218 A219

● Ex Stock / ab Lager ○ On demand / auf Anfrage

A

DN** Negative Insert·Negative WSP





Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall												Cermet unbeschichtet		Cermet Coated beschicht. Cerm.		Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151		YNG151C		YC10	YC40	YD051	YD101	YD201
PM	DNMG150412-PM	15.5	12.7	4.76	5.16	1.2		●										●		●	○								
	DNMG150416-PM	15.5	12.7	4.76	5.16	1.6		○																					
	DNMG150604-PM	15.5	12.7	6.35	5.16	0.4	●	●	○						○		●	●		○									
	DNMG150608-PM	15.5	12.7	6.35	5.16	0.8	●	●	●						○		●	●		●									
	DNMG150612-PM	15.5	12.7	6.35	5.16	1.2	●	●	●						●		○	●		●									
	DNMG150616-PM	15.5	12.7	6.35	5.16	1.6		●									●												
DM	DNMG110404-DM	11.6	9.525	4.76	3.81	0.4	●	●	○						●							●							
	DNMG110408-DM	11.6	9.525	4.76	3.81	0.8	●	●	●						○				○										
	DNMG110412-DM	11.6	9.525	4.76	3.81	1.2		○																					
	DNMG150404-DM	15.5	12.7	4.76	5.16	0.4	●	●														○							
	DNMG150408-DM	15.5	12.7	4.76	5.16	0.8	●	●							○				○			●							○
	DNMG150412-DM	15.5	12.7	4.76	5.16	1.2	○	○							○				○										
	DNMG150416-DM	15.5	12.7	4.76	5.16	1.6																							
	DNMG150604-DM	15.5	12.7	6.35	5.16	0.4	●	●	○				○	●	●							○							
	DNMG150608-DM	15.5	12.7	6.35	5.16	0.8	●	●	●				○	○	●				○			●							
	DNMG150612-DM	15.5	12.7	6.35	5.16	1.2	●	●	○						○				○										
	DNMG150616-DM	15.5	12.7	6.35	5.16	1.6		●	●																				

Medium Cut/ Mittl. Bearb.

Medium Cut/ Mittl. Bearb.

Tool holder / Klemmhalter











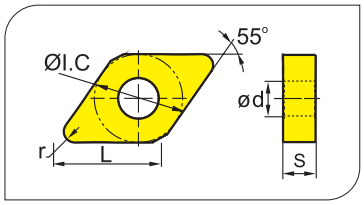


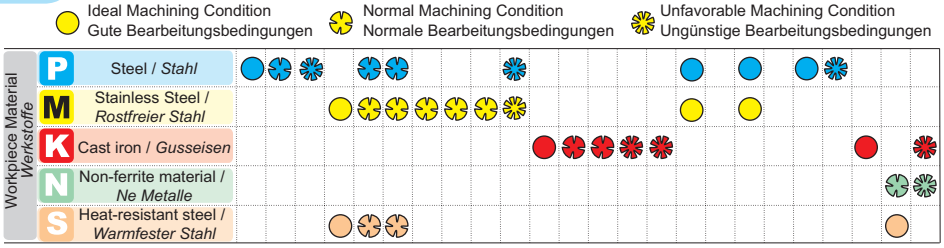
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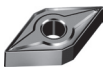
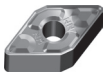
Insert code key ISO Code A42-A43
Grade selection reference Sortenauswahl A14/A31-A40
chip breaker selection reference Spanbrecherauswahl A24-A30
Recommended cutting parameters Empfohlene Schnittparameter A249-A253

A

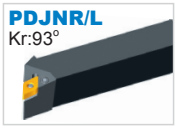
CN** Negative Insert·Negative WSP



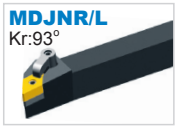


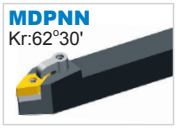
Insert Shape Schneidplattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall													Cermet unbeschichtet		Cermet Coated beschicht. Cerm.		Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151		YNG151C		YC10	YC40	YD051	YD101	YD201
EM  Medium Cut/ Mittl. Bearb.	DNMG110404-EM	11.6	9.525	4.76	3.81	0.4					●	○																
	DNMG110408-EM	11.6	9.525	4.76	3.81	0.8					●	○			●													
	DNMG110412-EM	11.6	9.525	4.76	3.81	1.2						○																
	DNMG150404-EM	15.5	12.7	4.76	5.16	0.4					●	○																
	DNMG150408-EM	15.5	12.7	4.76	5.16	0.8					●	○																
	DNMG150412-EM	15.5	12.7	4.76	5.16	1.2						○																
	DNMG150604-EM	15.5	12.7	6.35	5.16	0.4					●	●			●													
	DNMG150608-EM	15.5	12.7	6.35	5.16	0.8					●	●	○	●	●													
	DNMG150612-EM	15.5	12.7	6.35	5.16	1.2					●	○			●													
NM  Medium Cut/ Mittl. Bearb.	DNMG150412-NM	15.5	12.7	4.76	5.16	1.2																						
	DNMG150612-NM	15.5	12.7	6.35	5.16	1.2				○					○													○
DR  Roughing/ Schruppen	DNMG150408-DR	15.5	12.7	4.76	5.16	0.8																						
	DNMG150412-DR	15.5	12.7	4.76	5.16	1.2		○										○		○								
	DNMG150416-DR	15.5	12.7	4.76	5.16	1.6																						
	DNMG150608-DR	15.5	12.7	6.35	5.16	0.8	●	●	●									●		●								
	DNMG150612-DR	15.5	12.7	6.35	5.16	1.2	●	●	●									●		●								
	DNMG150616-DR	15.5	12.7	6.35	5.16	1.6		●	○									●		●								

Tool holder / Klemmhalter


PDJNR/L Kr:93°


PDNNR/L Kr:63°


MDJNR/L Kr:93°


MDPNN Kr:62°30'

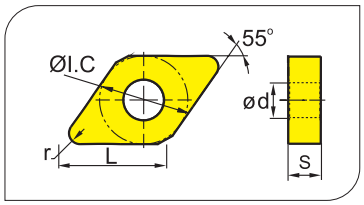

PDSNR/L Kr:62°30'

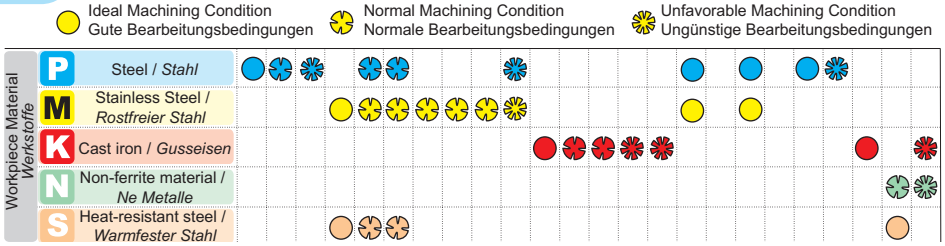

PDUNR/L Kr:93°

Page/Seite A160 A161 A172 A173 A218 A219

● Ex Stock / ab Lager ○ On demand / auf Anfrage

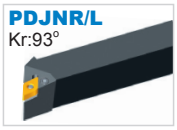
DN** Negative Insert·Negative WSP





Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall											Cermet unbeschichtet	Cermet Coated beschicht. Cerm.	Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151	YNG151C	YC10	YC40	YD051	YD101	YD201
Flat 	**DNMA110416**	11.6	9.525	4.76	3.81	1.6																					
	DNMA110424	11.6	9.525	4.76	3.81	2.4																					
	DNMA150404	15.5	12.7	4.76	5.16	0.4													○								
	DNMA150408	15.5	12.7	4.76	5.16	0.8											○	●	○								
	DNMA150604	15.5	12.7	6.35	5.16	0.4											○	●		●							
	DNMA150608	15.5	12.7	6.35	5.16	0.8	○										●	●	○	●							
	DNMA150612	15.5	12.7	6.35	5.16	1.2											●	●	○	●							
	DNMA150616	15.5	12.7	6.35	5.16	1.6											○	○		●							

Tool holder / Klemmhalter


PDJNR/L
Kr:93°
Page/Seite A160


PDNNR/L
Kr:63°
A161


MDJNR/L
Kr:93°
A172


MDPNN
Kr:62°30'
A173

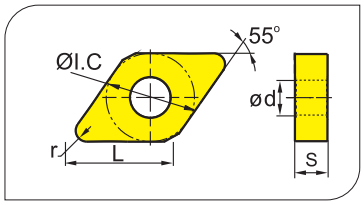

PDSNR/L
Kr:62°30'
A218

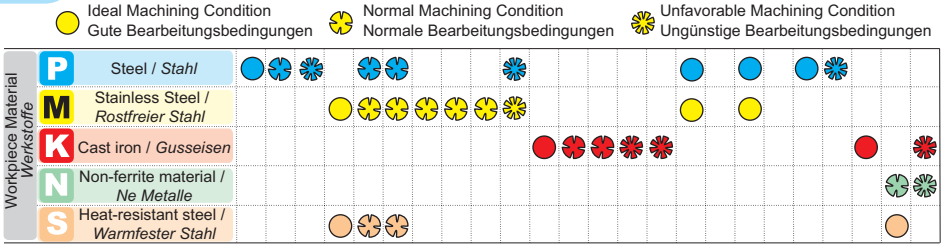

PDUNR/L
Kr:93°
A219

Insert code key ISO Code A42-A43
Grade selection reference Sortenauswahl A14/A31-A40
chip breaker selection reference Spanbrecherauswahl A24-A30
Recommended cutting parameters Empfohlene Schnittparameter A249-A253

A

DN** Negative Insert·Negative WSP





Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall													Cermet unbeschichtet		Cermet Coated beschicht. Cerm.		Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151		YNG151C		YC10	YC40	YD051	YD101	YD201
DR	DNMM150608-DR	15.5	12.7	6.35	5.16	0.8	●	●	○						○														
	DNMM150612-DR	15.5	12.7	6.35	5.16	1.2	●	●																					
	DNMM150616-DR	15.5	12.7	6.35	5.16	1.6		●	○										○										
Roughing/ Schruppen																													
ER	DNMG150608-ER	15.5	12.7	6.35	5.16	0.8								●															
	DNMG150612-ER	15.5	12.7	6.35	5.16	1.2								●															
Roughing/ Schruppen																													
ER	DNMM150608-ER	15.5	12.7	6.35	5.16	0.8								○															
	DNMM150612-ER	15.5	12.7	6.35	5.16	1.2								○															
Roughing/ Schruppen																													
HDR	DNMM150608-HDR	15.5	12.7	6.35	5.16	0.8	○	●	●																				
	DNMM150612-HDR	15.5	12.7	6.35	5.16	1.2	○	●	○																				
	DNMM150616-HDR	15.5	12.7	6.35	5.16	1.6		○	○																				
Roughing/ Schruppen																													
Basic	DNMG150604	15.5	12.7	6.35	5.16	0.4																							
	DNMG150608	15.5	12.7	6.35	5.16	0.8		○																					
	DNMG150612	15.5	12.7	6.35	5.16	1.2																							
	DNMG150616	15.5	12.7	6.35	5.16	1.6																							
	DNMG190608	19.3	15.875	6.35	7.94	0.8																							
	DNMG190612	19.3	15.875	6.35	7.94	1.2																							

Tool holder / Klemmhalter









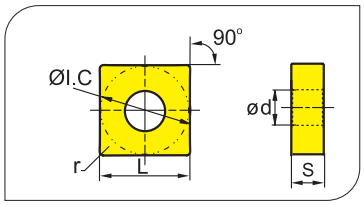


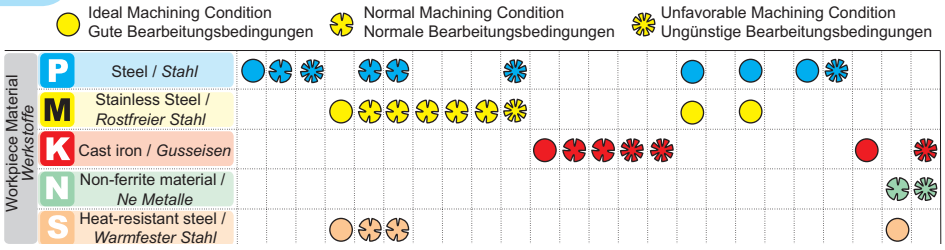


Page/Seite A160 A161 A172 A173 A218 A219

● Ex Stock / ab Lager ○ On demand / auf Anfrage

SN** Negative Insert·Negative WSP





Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall												Cermet unbeschichtet		Cermet Coated beschicht. Cerm.	Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151		YNG151C	YC10	YC40	YD051	YD101	YD201
DF  Finishing Schlichten	SNMG090304-DF	9.525	9.525	3.18	3.81	0.4																						
	SNMG090308-DF	9.525	9.525	3.18	3.81	0.8																						
	SNMG120404-DF	12.7	12.7	4.76	5.16	0.4																						
	SNMG120408-DF	12.7	12.7	4.76	5.16	0.8	●	●																				
	SNMG120412-DF	12.7	12.7	4.76	5.16	1.2	●	●																				
EF  Finishing Schlichten	SNMG090304-EF	9.525	9.525	3.18	3.81	0.4					●	○																
	SNMG090308-EF	9.525	9.525	3.18	3.81	0.8					●	○																
	SNMG090312-EF	9.525	9.525	3.18	3.81	1.2						○																
	SNMG120404-EF	12.7	12.7	4.76	5.16	0.4					○	●																
	SNMG120408-EF	12.7	12.7	4.76	5.16	0.8					●	○																
	SNMG120412-EF	12.7	12.7	4.76	5.16	1.2					●	○		●														
	SNMG150608-EF	15.875	15.875	6.35	6.35	0.8					○	○																
	SNMG150612-EF	15.875	15.875	6.35	6.35	1.2						○																

Tool holder / Klemmhalter















Page/Seite A162 A163 A164 A165 A174 A175 A176



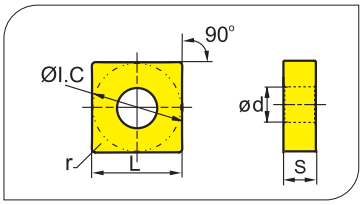


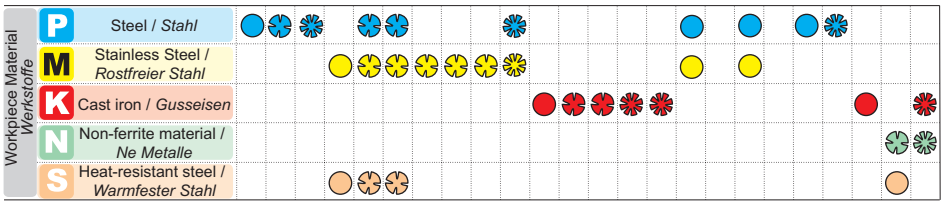
Page/Seite A177 A221

Insert code key ISO Code A42-A43
Grade selection reference Sortenauswahl A14/A31-A40
chip breaker selection reference Spanbrecherauswahl A24-A30
Recommended cutting parameters Empfohlene Schnittparameter A249-A253

SN** Negative Insert·Negative WSP

Ideal Machining Condition / Gute Bearbeitungsbedingungen
Normal Machining Condition / Normale Bearbeitungsbedingungen
Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen





Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall												Cermet unbeschichtet	Cermet Coated beschicht. Cerm.	Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151	YNG151C	YC10	YC40	YD051	YD101	YD201
SF Finishing Schlichten	SNMG090304-SF	9.525	9.525	3.18	3.81	0.4																	●					
	SNMG090308-SF	9.525	9.525	3.18	3.81	0.8																	●					
	SNMG120404-SF	12.7	12.7	4.76	5.16	0.4																	●					
	SNMG120408-SF	12.7	12.7	4.76	5.16	0.8																	●					
	SNMG120412-SF	12.7	12.7	4.76	5.16	1.2																	○					
	SNMG150608-SF	15.875	15.875	6.35	6.35	0.8																	●					
PM Medium Cut/ Mittl. Bearb.	SNMG090304-PM	9.525	9.525	3.18	3.81	0.4		●																				
	SNMG090308-PM	9.525	9.525	3.18	3.81	0.8	○	●	●								●			●								
	SNMG090312-PM	9.525	9.525	3.18	3.81	1.2	○	○																				
	SNMG120404-PM	12.7	12.7	4.76	5.16	0.4	●	●										○		○								
	SNMG120408-PM	12.7	12.7	4.76	5.16	0.8	○	●	●								●	●		●								
	SNMG120412-PM	12.7	12.7	4.76	5.16	1.2	●	●	●								○	○		●								
	SNMG120416-PM	12.7	12.7	4.76	5.16	1.6		○	○								●	●		●								
	SNMG150608-PM	15.875	15.875	6.35	6.35	0.8																						
	SNMG150612-PM	15.875	15.875	6.35	6.35	1.2		●	○								○	●		○								
	SNMG190612-PM	19.05	19.05	6.35	7.94	1.2		○									○			○								
	SNMG190616-PM	19.05	19.05	6.35	7.94	1.6		○																				

Tool holder / Klemmhalter















Page/Seite A162 A163 A164 A165 A174 A175 A176



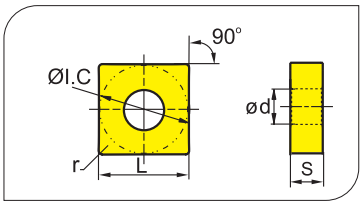


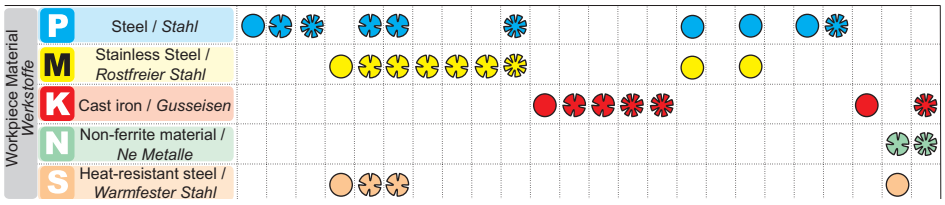
Page/Seite A177 A221

● Ex Stock / ab Lager ○ On demand / auf Anfrage

SN** Negative Insert·Negative WSP

Ideal Machining Condition / Gute Bearbeitungsbedingungen
Normal Machining Condition / Normale Bearbeitungsbedingungen
Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen





Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall												Cermet unbeschichtet	Cermet Coated beschicht. Cerm.	Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151	YNG151C	YC10	YC40	YD051	YD101	YD201
DM  Medium Cut/ Mittl. Bearb.	SNMG090304-DM	9.525	9.525	3.18	3.81	0.4		○																			
	SNMG090308-DM	9.525	9.525	3.18	3.81	0.8	●	●	○																		
	SNMG120404-DM	12.7	12.7	4.76	5.16	0.4	●	●							●	○			○			●						
	SNMG120408-DM	12.7	12.7	4.76	5.16	0.8	●	●	●					●	●	○			○									
	SNMG120412-DM	12.7	12.7	4.76	5.16	1.2	●	●	●		○			○	●	○						○						
	SNMG120416-DM	12.7	12.7	4.76	5.16	1.6	○	●	○																			
	SNMG150608-DM	15.875	15.875	6.35	6.35	0.8	○	●																				
	SNMG150612-DM	15.875	15.875	6.35	6.35	1.2	●	●	○																			
	SNMG150616-DM	15.875	15.875	6.35	6.35	1.6		○																				
	SNMG190612-DM	19.05	19.05	6.35	7.94	1.2	●	●	○						●	○												
	SNMG190616-DM	19.05	19.05	6.35	7.94	1.6		●	●						○	○												
EM  Medium Cut/ Mittl. Bearb.	SNMG120404-EM	12.7	12.7	4.76	5.16	0.4					○	●																
	SNMG120408-EM	12.7	12.7	4.76	5.16	0.8					●	●			●	○												
	SNMG120412-EM	12.7	12.7	4.76	5.16	1.2					●	○			●	○												
	SNMG120416-EM	12.7	12.7	4.76	5.16	1.6						○																
	SNMG150612-EM	15.875	15.875	6.35	6.35	1.2						○																
	SNMG150616-EM	15.875	15.875	6.35	6.35	1.6						○																

Tool holder / Klemmhalter


PSBNR/L Kr:75°
Page/Seite A162


PSDNN Kr:45°
A163


PSKNR/L Kr:75°
A164


PSSNR/L Kr:45°
A165


MSBNR/L Kr:75°
A174


MSRNR/L Kr:75°
A175


MSKNR/L Kr:75°
A176

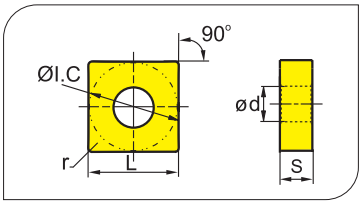

MSDNN Kr:45°
Page/Seite A177

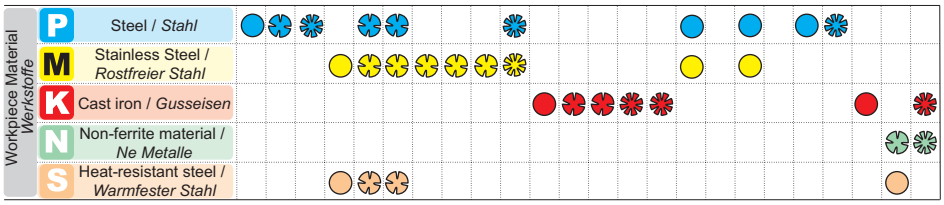

PSKNR/L Kr:75°
A221

Insert code key ISO Code A42-A43
Grade selection reference Sortenauswahl A14/A31-A40
chip breaker selection reference Spanbrecherauswahl A24-A30
Recommended cutting parameters Empfohlene Schnittparameter A249-A253

SN** Negative Insert·Negative WSP

Ideal Machining Condition / Gute Bearbeitungsbedingungen
Normal Machining Condition / Normale Bearbeitungsbedingungen
Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen





Insert Shape Schneidplattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall													Cermet unbeschichtet	Cermet Coated beschicht. Cerm.	Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151	YNG151C	YC10	YC40	YD051	YD101	YD201
NM  Medium Cut/ Mittl. Bearb.	**SNMG120408-NM**	12.7	12.7	4.76	5.16	0.8				●																	
	SNMG120412-NM	12.7	12.7	4.76	5.16	1.2																					
DR  Roughing/ Schruppen	**SNMG120408-DR**	12.7	12.7	4.76	5.16	0.8	●	●	●									●		●								
	SNMG120412-DR	12.7	12.7	4.76	5.16	1.2	●	●	●									●		●	○							
	SNMG120416-DR	12.7	12.7	4.76	5.16	1.6	○	●	○									●		●								
	SNMG150608-DR	15.875	15.875	6.35	6.35	0.8		○												○								
	SNMG150612-DR	15.875	15.875	6.35	6.35	1.2	●	●	●									●		●								
	SNMG150616-DR	15.875	15.875	6.35	6.35	1.6		●	●									●		○								
	SNMG150624-DR	15.875	15.875	6.35	6.35	2.4		○																				
	SNMG190612-DR	19.05	19.05	6.35	7.94	1.2	○	●	●											●								
	SNMG190616-DR	19.05	19.05	6.35	7.94	1.6	●	●	●									○		●								
	SNMG190624-DR	19.05	19.05	6.35	7.94	2.4	○	●	●																			
DR  Roughing/ Schruppen	**SNMM120408-DR**	12.7	12.7	4.76	5.16	0.8																					
	SNMM120412-DR	12.7	12.7	4.76	5.16	1.2																					
	SNMM120416-DR	12.7	12.7	4.76	5.16	1.6																					
	SNMM150608-DR	15.875	15.875	6.35	6.35	0.8																					
	SNMM150612-DR	15.875	15.875	6.35	6.35	1.2		○																			
	SNMM150616-DR	15.875	15.875	6.35	6.35	1.6		●																			
	SNMM190608-DR	19.05	19.05	6.35	7.94	0.8		○																			

Tool holder / Klemmhalter


PSBNR/L Kr:75°


PSDNN Kr:45°


PSKNR/L Kr:75°


PSSNR/L Kr:45°


MSBNR/L Kr:75°


MSRNR/L Kr:75°


MSKNR/L Kr:75°

Page/Seite A162 A163 A164 A165 A174 A175 A176


MSDNN Kr:45°

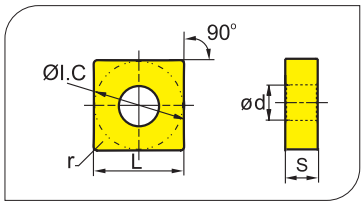

PSKNR/L Kr:75°

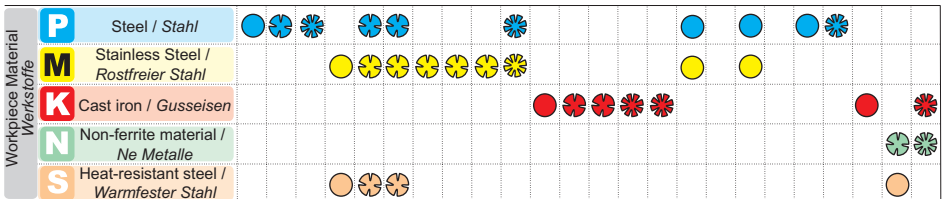
Page/Seite A177 A221

● Ex Stock / ab Lager ○ On demand / auf Anfrage

SN** Negative Insert·Negative WSP

Ideal Machining Condition / Gute Bearbeitungsbedingungen
Normal Machining Condition / Normale Bearbeitungsbedingungen
Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen

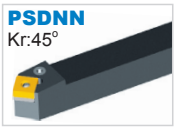




Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall												Cermet unbeschichtet	Cermet Coated beschicht. Cerm.	Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151	YNG151C	YC10	YC40	YD051	YD101	YD201
DR	SNMM190612-DR	19.05	19.05	6.35	7.94	1.2	○	●	○																		
	SNMM190616-DR	19.05	19.05	6.35	7.94	1.6	●	●	○																		
	SNMM190624-DR	19.05	19.05	6.35	7.94	2.4	●	●	●																		
	SNMM250724-DR	25.4	25.4	7.94	9.12	2.4		●	●																		
Roughing/ Schruppen	SNMM250924-DR	25.4	25.4	9.525	9.12	2.4		●	●																		
ER	SNMG120408-ER	12.7	12.7	4.76	5.16	0.8																					
	SNMG120412-ER	12.7	12.7	4.76	5.16	1.2																					
	SNMG150608-ER	15.875	15.875	6.35	6.35	0.8																					
	SNMG150612-ER	15.875	15.875	6.35	6.35	1.2								●													
Roughing/ Schruppen	SNMG190612-ER	19.05	19.05	6.35	7.94	1.2								●													
	SNMG190616-ER	19.05	19.05	6.35	7.94	1.6								●													
ER	SNMM250724-ER	25.4	25.4	7.94	9.12	2.4								●													
	SNMM250732-ER	25.4	25.4	7.94	9.12	3.2		○																			
	SNMM250924-ER	25.4	25.4	9.525	9.12	2.4		○						○		●											
Roughing/ Schruppen	SNMM250932-ER	25.4	25.4	9.525	9.12	3.2		○								●											

Tool holder / Klemmhalter


PSBNR/L Kr:75°


PSDNN Kr:45°


PSKNR/L Kr:75°


PSSNR/L Kr:45°


MSBNR/L Kr:75°


MSRNR/L Kr:75°


MSKNR/L Kr:75°

Page/Seite A162 A163 A164 A165 A174 A175 A176


MSDNN Kr:45°


PSKNR/L Kr:75°

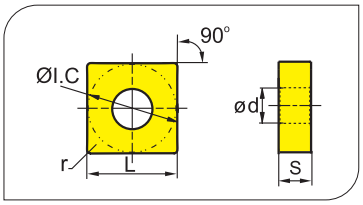
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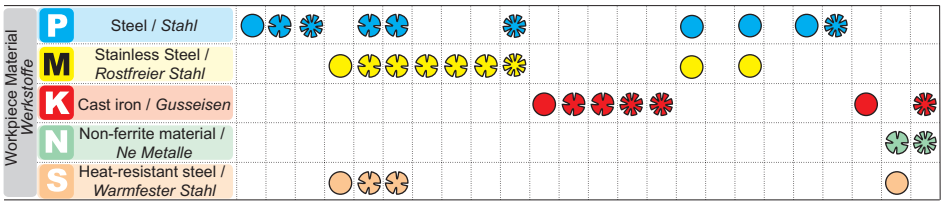
Insert code key ISO Code A42-A43
Grade selection reference Sortenauswahl A14/A31-A40
chip breaker selection reference Spanbrecherauswahl A24-A30
Recommended cutting parameters Empfohlene Schnittparameter A249-A253

A

SN** Negative Insert·Negative WSP

Ideal Machining Condition / Gute Bearbeitungsbedingungen
Normal Machining Condition / Normale Bearbeitungsbedingungen
Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen





Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall													Cermet unbeschichtet		Cermet Coated beschicht. Cerm.		Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151		YNG151C		YC10	YC40	YD051	YD101	YD201
HDR  Roughing/ Schruppen	SNMM120408-HDR	12.7	12.7	4.76	5.16	0.8	○	●	●																			
	SNMM120412-HDR	12.7	12.7	4.76	5.16	1.2	●	●	●						●													
	SNMM120416-HDR	12.7	12.7	4.76	5.16	1.6			○																			
	SNMM150608-HDR	15.875	15.875	6.35	6.35	0.8		●	○																			
	SNMM150612-HDR	15.875	15.875	6.35	6.35	1.2	●	●	●																			
	SNMM150616-HDR	15.875	15.875	6.35	6.35	1.6		●	○																			
	SNMM150624-HDR	15.875	15.875	6.35	6.35	2.4																						
	SNMM190608-HDR	19.05	19.05	6.35	7.94	0.8																						
	SNMM190612-HDR	19.05	19.05	6.35	7.94	1.2		●																				
	SNMM190616-HDR	19.05	19.05	6.35	7.94	1.6	●	●	○																			
	SNMM190624-HDR	19.05	19.05	6.35	7.94	2.4		○																				
	SNMM250724-HDR	25.4	25.4	7.94	9.12	2.4		○	●																			
	SNMM250924-HDR	25.4	25.4	9.525	9.12	2.4		○																				

Tool holder / Klemmhalter


PSBNR/L Kr:75°


PSDNN Kr:45°


PSKNR/L Kr:75°


PSSNR/L Kr:45°


MSBNR/L Kr:75°


MSRNR/L Kr:75°


MSKNR/L Kr:75°

Page/Seite A162 A163 A164 A165 A174 A175 A176

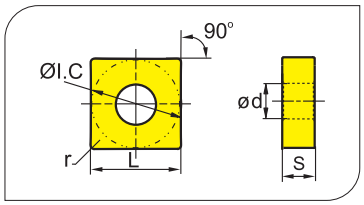

MSDNN Kr:45°

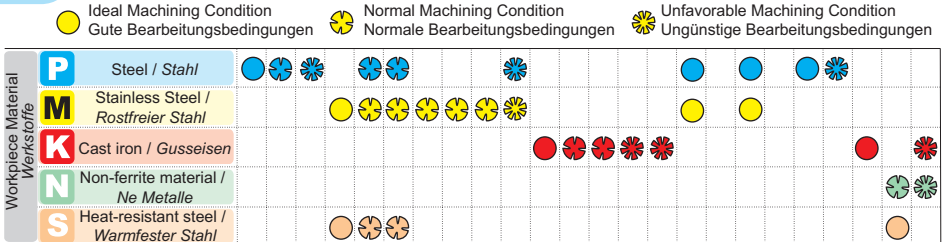

PSKNR/L Kr:75°

Page/Seite A177 A221

● Ex Stock / ab Lager ○ On demand / auf Anfrage

SN** Negative Insert·Negative WSP





Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall													Cermet unbeschichtet	Cermet Coated beschicht. Cerm.	Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151	YNG151C	YC10	YC40	YD051	YD101	YD201
Basic	SNMG090304	9.525	9.525	3.18	3.81	0.4	○	○																			
	SNMG090308	9.525	9.525	3.18	3.81	0.8	○	○																			
	SNMG120404	12.7	12.7	4.76	5.16	0.4	○																				
	SNMG120408	12.7	12.7	4.76	5.16	0.8	○	●																○			
	SNMG120412	12.7	12.7	4.76	5.16	1.2	○	○	○																		
	SNMG120416	12.7	12.7	4.76	5.16	1.6		○																			
	SNMG150608	15.875	15.875	6.35	6.35	0.8																					
	SNMG150612	15.875	15.875	6.35	6.35	1.2	○	○																			
	SNMG190612	19.05	19.05	6.35	7.94	1.2		○																			
	SNMG190616	19.05	19.05	6.35	7.94	1.6		○																			
	SNMG250724	25.4	25.4	7.94	9.12	2.4			●																		
	SNMG250924	25.4	25.4	9.525	9.12	2.4			●																		
Basic	SNMM090304	9.525	9.525	3.18	3.81	0.4																					
	SNMM090308	9.525	9.525	3.18	3.81	0.8																					
	SNMM120408	12.7	12.7	4.76	5.16	0.8		○																			
	SNMM120412	12.7	12.7	4.76	5.16	1.2																					
	SNMM120416	12.7	12.7	4.76	5.16	1.6																					

Tool holder / Klemmhalter


PSBNR/L Kr:75°


PSDNN Kr:45°


PSKNR/L Kr:75°


PSSNR/L Kr:45°


MSBNR/L Kr:75°


MSRNR/L Kr:75°


MSKNR/L Kr:75°

Page/Seite A162 A163 A164 A165 A174 A175 A176


MSDNN Kr:45°

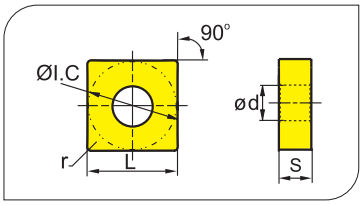

PSKNR/L Kr:75°

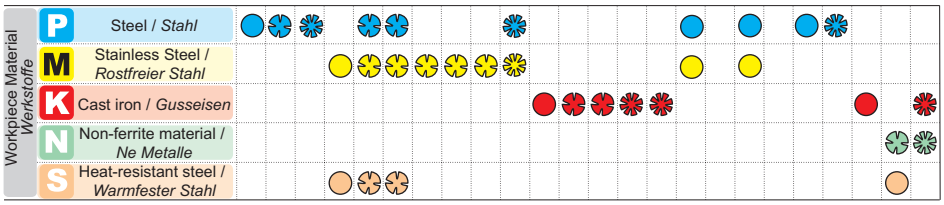
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Insert code key ISO Code A42-A43
Grade selection reference Sortenauswahl A14/A31-A40
chip breaker selection reference Spanbrecherauswahl A24-A30
Recommended cutting parameters Empfohlene Schnittparameter A249-A253

SN** Negative Insert·Negative WSP

Ideal Machining Condition / Gute Bearbeitungsbedingungen
Normal Machining Condition / Normale Bearbeitungsbedingungen
Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen





Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall												Cermet unbeschichtet		Cermet Coated beschicht. Cerm.		Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151		YNG151C		YC10	YC40	YD051	YD101	YD201
Basic	SNMM190608	19.05	19.05	6.35	7.94	0.8																							
	SNMM190612	19.05	19.05	6.35	7.94	1.2	○	●	○																				
	SNMM190616	19.05	19.05	6.35	7.94	1.6		○																					
	SNMM250724	25.4	25.4	7.94	9.12	2.4		○	○										○										
	SNMM250924	25.4	25.4	9.525	9.12	2.4		○	●																				
Flat	SNMA090304	9.525	9.525	3.18	3.81	0.4																							
	SNMA090308	9.525	9.525	3.18	3.81	0.8											○												
	SNMA120404	12.7	12.7	4.76	5.16	0.4											○		○										
	SNMA120408	12.7	12.7	4.76	5.16	0.8	○										●	●	○	●	○								●
	SNMA120416	12.7	12.7	4.76	5.16	1.6											●	●	○	●									
	SNMA150608	15.875	15.875	6.35	6.35	0.8	○												○										
	SNMA150612	15.875	15.875	6.35	6.35	1.2													○	●									
	SNMA190612	19.05	19.05	6.35	7.94	1.2											○	●	○	●									
	SNMA190616	19.05	19.05	6.35	7.94	1.6											○	○	○	●									

Tool holder / Klemmhalter


PSBNR/L Kr:75°


PSDNN Kr:45°


PSKNR/L Kr:75°


PSSNR/L Kr:45°


MSBNR/L Kr:75°


MSRNR/L Kr:75°


MSKNR/L Kr:75°

Page/Seite A162 A163 A164 A165 A174 A175 A176


MSDNN Kr:45°

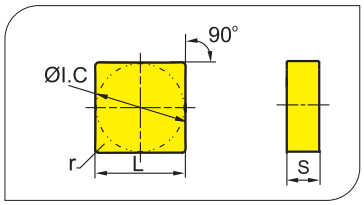

PSKNR/L Kr:75°

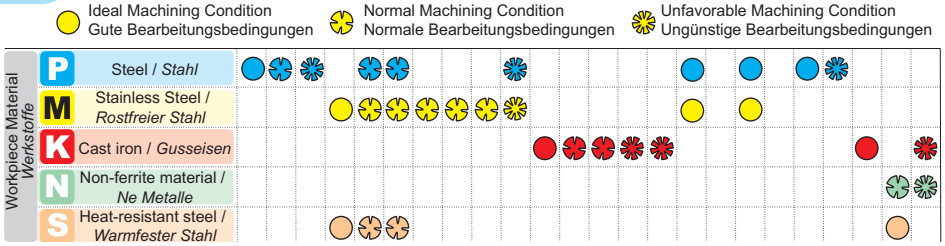
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● Ex Stock / ab Lager ○ On demand / auf Anfrage

A

SN** Negative Insert·Negative WSP



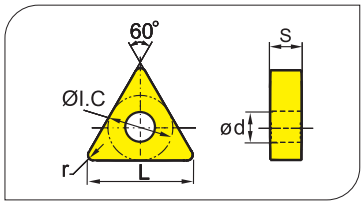


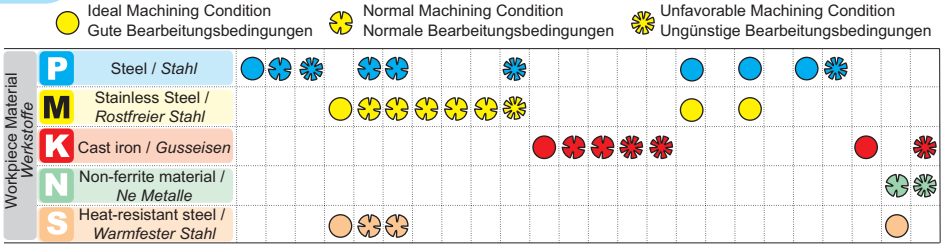
Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall													Cermet unbeschichtet		Cermet Coated beschicht. Cerm.		Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151		YNG151C		YC10	YC40	YD051	YD101	YD201
Flat	**SNGN090308**	9.525	9.525	3.18	-	0.8																							
	SNGN120408	12.7	12.7	4.76	-	0.8																							
	SNGN150408	15.875	15.875	4.76	-	0.8																							
	SNGN190412	19.05	19.05	4.76	-	1.2																							
	SNUN090304	9.525	9.525	3.18	-	0.4	○	○											○										
	SNUN090308	9.525	9.525	3.18	-	0.8																							
	SNUN120408	12.7	12.7	4.76	-	0.8													○	○						●			
	SNUN120412	12.7	12.7	4.76	-	1.2	○	●	○									○	○							○			○
	SNUN150408	15.875	15.875	4.76	-	0.8																							
	SNUN150412	15.875	15.875	4.76	-	1.2																							
	SNUN190408	19.05	19.05	4.76	-	0.8																							
	SNUN190412	19.05	19.05	4.76	-	1.2																							
	SNUN190424	19.05	19.05	4.76	-	2.4																							
	SNUN250724	25.4	25.4	7.94	-	2.4																							
	SNUN250924	25.4	25.4	9.525	-	2.4																							

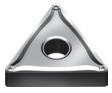
Insert code key ISO Code A42-A43
Grade selection reference Sortenauswahl A14/A31-A40
chip breaker selection reference Spanbrecherauswahl A24-A30
Recommended cutting parameters Empfohlene Schnittparameter A249-A253

A

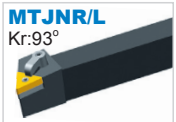
TN** Negative Insert·Negative WSP





Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall													Cermet unbeschichtet		Cermet Coated beschicht. Cerm.		Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151		YNG151C		YC10	YC40	YD051	YD101	YD201
DF  Finishing Schlichten	**TNMG160404-DF**	16.5	9.525	4.76	3.81	0.4	●	●						●								●								
	TNMG160408-DF	16.5	9.525	4.76	3.81	0.8	●	●						●								●								
	TNMG160412-DF	16.5	9.525	4.76	3.81	1.2	●	●						○	○															
	TNMG220408-DF	22	12.7	4.76	5.16	0.8	●	○						○																
	TNMG220412-DF	22	12.7	4.76	5.16	0.8	●	●						○																
WG  Wiper	**TNMX160404-WG**	16.5	9.525	4.76	3.81	0.4	●																							
	TNMX160408-WG	16.5	9.525	4.76	3.81	0.8	●	●																						
	TNMX160412-WG	16.5	9.525	4.76	3.81	1.2	●	●																						
SF  Finishing Schlichten	**TNMG110304-SF**	11	6.35	3.18	2.26	0.4																		●						
	TNMG160404-SF	16.5	9.525	4.76	3.81	0.4																		●						
	TNMG160408-SF	16.5	9.525	4.76	3.81	0.8																		●						
	TNMG220408-SF	22	12.7	4.76	5.16	0.8																		○						
	TNMG220412-SF	22	12.7	4.76	5.16	1.2																		○						
EF  Finishing Schlichten	**TNMG110304-EF**	11	6.35	3.18	2.26	0.4						○																		
	TNMG110308-EF	11	6.35	3.18	2.26	0.8						●																		
	TNMG160404-EF	16.5	9.525	4.76	3.81	0.4					●	●		●																
	TNMG160408-EF	16.5	9.525	4.76	3.81	0.8					●	●		●	○															
	TNMG160412-EF	16.5	9.525	4.76	3.81	1.2					●	○																		
	TNMG220404-EF	22	12.7	4.76	5.16	0.4					●	●																		
	TNMG220408-EF	22	12.7	4.76	5.16	0.8					●	●																		
	TNMG220412-EF	22	12.7	4.76	5.16	1.2					●	○																		

Tool holder / Klemmhalter

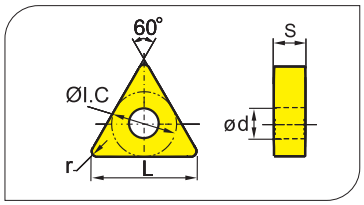
PTFNR/L Kr:90°	**PTTNR/L** Kr:60°	**PTGNR/L** Kr:90°	**MTGNR/L** Kr:90°	**MTJNR/L** Kr:93°	**MTFNR/L** Kr:90°	**PTFNR/L** Kr:90°
						
Page/Seite A166	A167	A168	A178	A179	A180	A222

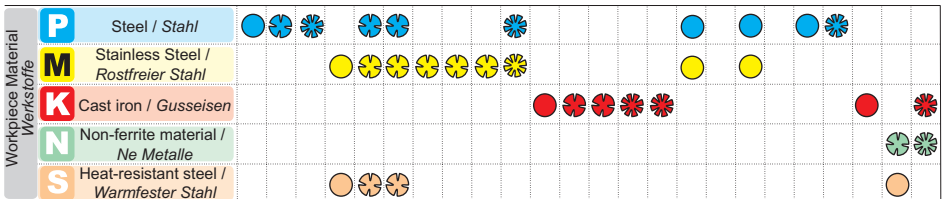
● Ex Stock / ab Lager ○ On demand / auf Anfrage

A

TN** Negative Insert·Negative WSP

Ideal Machining Condition / Gute Bearbeitungsbedingungen
Normal Machining Condition / Normale Bearbeitungsbedingungen
Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen





Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall												Cermet unbeschichtet	Cermet Coated beschicht. Cerm.	Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151	YNG151C	YC10	YC40	YD051	YD101	YD201
FM	**TNMG160404R-FM**	16.5	9.525	4.76	3.81	0.4		●				●															
	TNMG160408R-FM	16.5	9.525	4.76	3.81	0.8		●				●															
	TNMG160404L-FM	16.5	9.525	4.76	3.81	0.4		●				●															
Finishing Schlichten	**TNMG160408L-FM**	16.5	9.525	4.76	3.81	0.8		●				●															
PM	**TNMG110304-PM**	11	6.35	3.18	2.26	0.4	●	●																			
	TNMG110308-PM	11	6.35	3.18	2.26	0.8	●	●																			
	TNMG160404-PM	16.5	9.525	4.76	3.81	0.4	●	●	●						○		●	●		●							
	TNMG160408-PM	16.5	9.525	4.76	3.81	0.8	●	●	●						○		●	●		●							
	TNMG160412-PM	16.5	9.525	4.76	3.81	1.2	○	●							○		●	●	○	●	○						
Medium Cut/ Mittl. Bearb.	**TNMG220408-PM**	22	12.7	4.76	5.16	0.8	●	●	●						○		○	●		●							
	TNMG220412-PM	22	12.7	4.76	5.16	1.2	○	●	●								○	●		●							
	TNMG220416-PM	22	12.7	4.76	5.16	1.6		●	○								○	●		○							
DM	**TNMG110308-DM**	11	6.35	3.18	2.26	0.8		●														●					
	TNMG160404-DM	16.5	9.525	4.76	3.81	0.4	●	●	●						●							●					
	TNMG160408-DM	16.5	9.525	4.76	3.81	0.8	●	●	●						●		●					●					
	TNMG160412-DM	16.5	9.525	4.76	3.81	1.2	●	●	●						○												
	TNMG220404-DM	22	12.7	4.76	5.16	0.4		●	○						○												
	TNMG220408-DM	22	12.7	4.76	5.16	0.8	●	●	●						●							○					
Medium Cut/ Mittlere Bear	**TNMG220412-DM**	22	12.7	4.76	5.16	1.2	●	●	●						○				○								
	TNMG220416-DM	22	12.7	4.76	5.16	1.6		●	●						●							○					

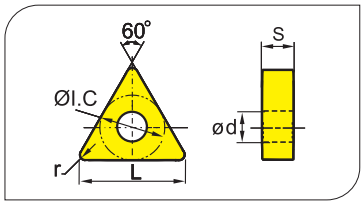
Tool holder / Klemmhalter

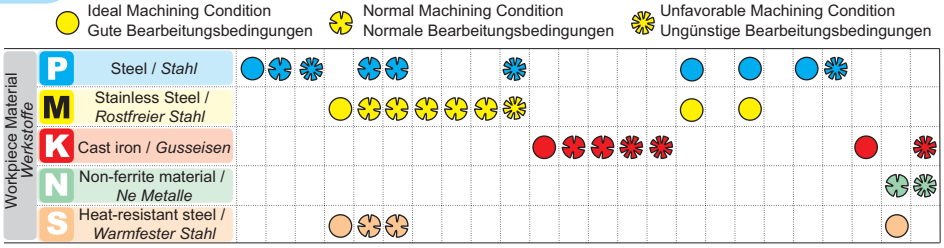
PTFNR/L Kr:90°	PTTNR/L Kr:60°	PTGNR/L Kr:90°	MTGNR/L Kr:90°	MTJNR/L Kr:93°	MTFNR/L Kr:90°	PTFNR/L Kr:90°
Page/Seite A166	A167	A168	A178	A179	A180	A222

Insert code key ISO Code A42-A43
Grade selection reference Sortenauswahl A14/A31-A40
chip breaker selection reference Spanbrecherauswahl A24-A30
Recommended cutting parameters Empfohlene Schnittparameter A249-A253

A

TN** Negative Insert·Negative WSP





Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall													Cermet unbeschichtet		Cermet Coated beschicht. Cerm.		Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151		YNG151C		YC10	YC40	YD051	YD101	YD201
EM	TNMG160404-EM	16.5	9.525	4.76	3.81	0.4					●	●																	
	TNMG160408-EM	16.5	9.525	4.76	3.81	0.8					●	●			●														
	TNMG160412-EM	16.5	9.525	4.76	3.81	1.2					●	○																	
	TNMG220408-EM	22	12.7	4.76	5.16	0.8					●	●			●														
Medium Cut/ Mittl. Bearb.	TNMG220412-EM	22	12.7	4.76	5.16	1.2					●	●			●														
	TNMG220416-EM	22	12.7	4.76	5.16	1.6					●	●			●														
DR	TNMG160408-DR	16.5	9.525	4.76	3.81	0.8		●										●		●									
	TNMG160412-DR	16.5	9.525	4.76	3.81	1.2	●	●	●									●		●									
	TNMG220408-DR	22	12.7	4.76	5.16	0.8		●										○		○									
	TNMG220412-DR	22	12.7	4.76	5.16	1.2	○	●	●											●									
	TNMG220416-DR	22	12.7	4.76	5.16	1.6	●	●	○									○		●									
Roughing/ Schruppen	TNMG270608-DR	27.5	15.875	6.35	6.35	0.8			○																				
	TNMG270612-DR	27.5	15.875	6.35	6.35	1.2			○																				
	TNMG270616-DR	27.5	15.875	6.35	6.35	1.6	○																						

Tool holder / Klemmhalter

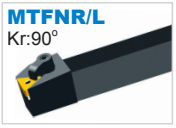

PTFNR/L Kr:90°


PTTNR/L Kr:60°


PTGNR/L Kr:90°


MTGNR/L Kr:90°


MTJNR/L Kr:93°


MTFNR/L Kr:90°


PTFNR/L Kr:90°

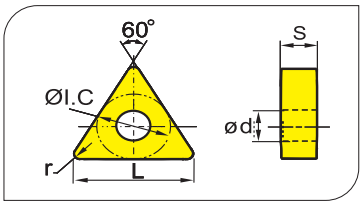
Page/Seite A166 A167 A168 A178 A179 A180 A222

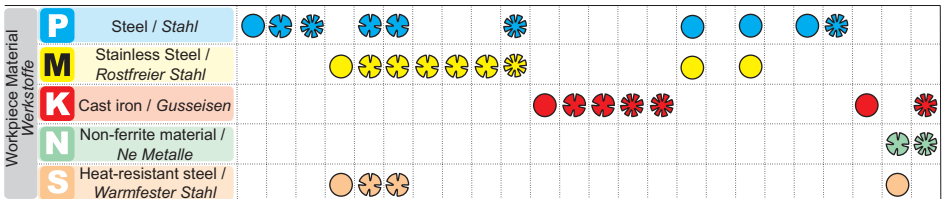
● Ex Stock / ab Lager ○ On demand / auf Anfrage

A

TN** Negative Insert·Negative WSP

Ideal Machining Condition / Gute Bearbeitungsbedingungen
Normal Machining Condition / Normale Bearbeitungsbedingungen
Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen





Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall												Cermet unbeschichtet		Cermet Coated beschicht. Cerm.		Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151		YNG151C		YC10	YC40	YD051	YD101	YD201
DR	**TNMM160408-DR**	16.5	9.525	4.76	3.81	0.8	●	●	●																				
	TNMM160412-DR	16.5	9.525	4.76	3.81	1.2		●																					
	TNMM220408-DR	22	12.7	4.76	5.16	0.8		●	●																				
	TNMM220412-DR	22	12.7	4.76	5.16	1.2		●	●																				
	TNMM220416-DR	22	12.7	4.76	5.16	1.6		○	●																				
	TNMM270412-DR	27.5	15.875	4.76	5.16	1.2																							
	TNMM270416-DR	27.5	15.875	4.76	5.16	1.6																							
ER	**TNMG160408-ER**	16.5	9.525	4.76	3.81	0.8								○															
	TNMG160412-ER	16.5	9.525	4.76	3.81	1.2								○															
	TNMG220408-ER	22	12.7	4.76	5.16	0.8								○															
	TNMG220412-ER	22	12.7	4.76	5.16	1.2								●															

Roughing/ Schruppen

Roughing/ Schruppen

Tool holder / Klemmhalter

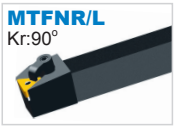

PTFNR/L Kr:90°


PTTNR/L Kr:60°


PTGNR/L Kr:90°


MTGNR/L Kr:90°


MTJNR/L Kr:93°


MTFNR/L Kr:90°

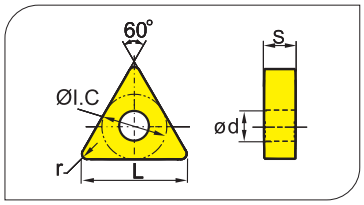

PTFNR/L Kr:90°

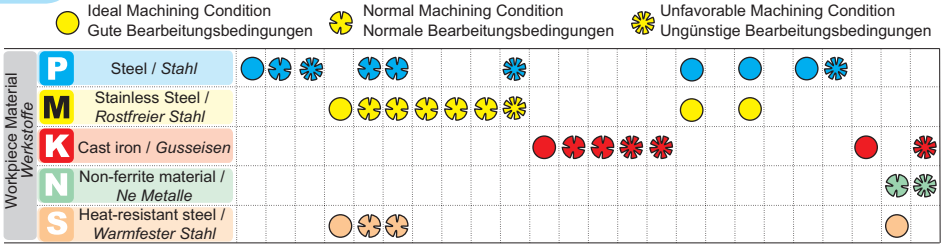
Page/Seite A166 A167 A168 A178 A179 A180 A222

Insert code key ISO Code A42-A43
Grade selection reference Sortenauswahl A14/A31-A40
chip breaker selection reference Spanbrecherauswahl A24-A30
Recommended cutting parameters Empfohlene Schnittparameter A249-A253

A

TN** Negative Insert·Negative WSP





Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall													Cermet unbeschichtet	Cermet Coated beschicht. Cerm.	Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151	YNG151C	YC10	YC40	YD051	YD101	YD201
HDR  Heavy Turning Schwer Zerspan-nung	**TNMM160408-HDR**	16.5	9.525	4.76	3.81	0.8																					
	TNMM160412-HDR	16.5	9.525	4.76	3.81	1.2																					
	TNMM220408-HDR	22	12.7	4.76	5.16	0.8																					
	TNMM220412-HDR	22	12.7	4.76	5.16	1.2																					
	TNMM220416-HDR	22	12.7	4.76	5.16	1.6		○																			
	TNMM270612-HDR	27.5	15.875	6.35	6.35	1.2																					
	TNMM270616-HDR	27.5	15.875	6.35	6.35	1.6		○																			
	TNMM270624-HDR	27.5	15.875	6.35	6.35	2.4		○																			
Basic 	**TNMG110308**	11	6.35	3.18	2.26	0.8																					
	TNMG160404	16.5	9.525	4.76	3.81	0.4		○											○								
	TNMG160408	16.5	9.525	4.76	3.81	0.8	○	●	○															○			
	TNMG160412	16.5	9.525	4.76	3.81	1.2	○	○																			
	TNMG220404	22	12.7	4.76	5.16	0.4		○																			
	TNMG220408	22	12.7	4.76	5.16	0.8	○	●	○										○								
	TNMG220412	22	12.7	4.76	5.16	1.2	○	○	○										○								
	TNMG220416	22	12.7	4.76	5.16	1.6		○																			
	TNMG270612	27.5	15.875	6.35	6.35	1.2			●																		
	TNMG270616	27.5	15.875	6.35	6.35	1.6			●																		
	TNMG330916	33	19.05	9.525	7.94	1.6			○																		
	TNMG330924	33	19.05	9.525	7.94	2.4			○																		

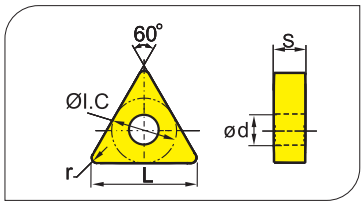
Tool holder / Klemmhalter

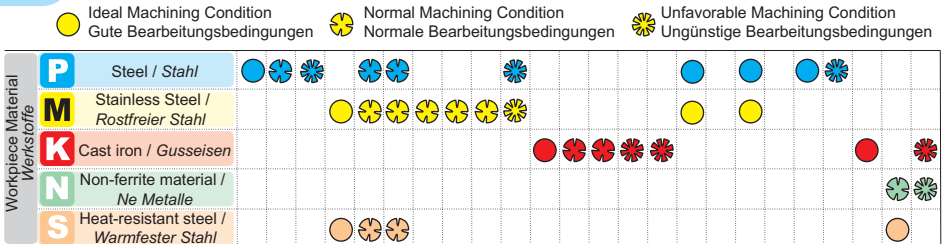


Page/Seite A166 A167 A168 A178 A179 A180 A222

● Ex Stock / ab Lager ○ On demand / auf Anfrage

TN** Negative Insert·Negative WSP





Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall													Cermet unbeschichtet		Cermet Coated beschicht. Cerm.		Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151		YNG151C		YC10	YC40	YD051	YD101	YD201
Basic	TNMM160404	16.5	9.525	4.76	3.81	0.4	○	●																					
	TNMM160408	16.5	9.525	4.76	3.81	0.8		○	○																				
	TNMM160412	16.5	9.525	4.76	3.81	1.2		●	●																				
	TNMM220408	22	12.7	4.76	5.16	0.8		●	●																				
	TNMM220412	22	12.7	4.76	5.16	1.2		●	○																				
	TNMM220416	22	12.7	4.76	5.16	1.6			○																				
	TNMM270616	27.5	15.875	6.35	6.35	1.6		○	●																				
Flat	TNMA160404	16.5	9.525	4.76	3.81	0.4											○	○	●	●									
	TNMA160408	16.5	9.525	4.76	3.81	0.8											●	●	●	●									
	TNMA160412	16.5	9.525	4.76	3.81	1.2											●	●	○	●									
	TNMA160416	16.5	9.525	4.76	3.81	1.6											●	○	○										
	TNMA220404	22	12.7	4.76	5.16	0.4											○		○										
	TNMA220408	22	12.7	4.76	5.16	0.8											●	●	○	●								○	○
	TNMA270616	27.5	15.875	6.35	6.35	1.6														○									

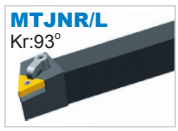
Tool holder / Klemmhalter

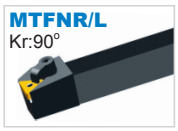












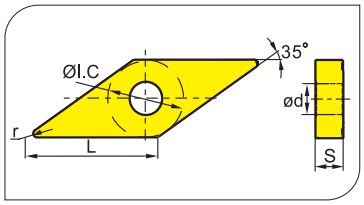


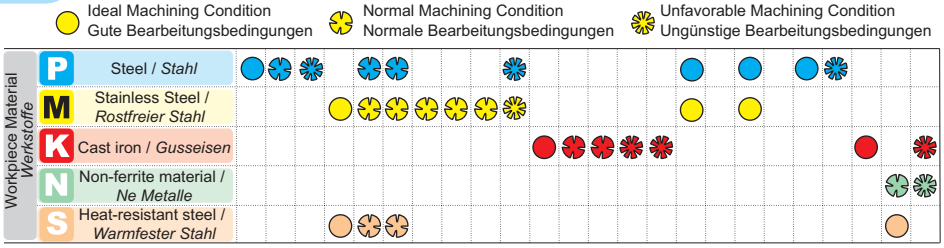
Page/Seite A166 A167 A168 A178 A179 A180 A222

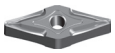
Insert code key ISO Code A42-A43
Grade selection reference Sortenauswahl A14/A31-A40
chip breaker selection reference Spanbrecherauswahl A24-A30
Recommended cutting parameters Empfohlene Schnittparameter A249-A253

A

VN** Negative Insert·Negative WSP





Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall													Cermet unbeschichtet	Cermet Coated beschicht. Cerm.	Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151	YNG151C	YC10	YC40	YD051	YD101	YD201
DF	**VNMG160404-DF**	16.6	9.525	4.76	3.81	0.4	●	●						●													
	**VNMG160408-DF**	16.6	9.525	4.76	3.81	0.8	●	●						●	●												
Finishing Schlichten																											
EF	**VNMG160404-EF**	16.6	9.525	4.76	3.81	0.4					●	●		●													
	**VNMG160408-EF**	16.6	9.525	4.76	3.81	0.8					●	●															
Finishing Schlichten	**VNMG160412-EF**	16.6	9.525	4.76	3.81	1.2						○															
NF	**VNEG160404-NF**	16.6	9.525	4.76	3.81	0.4				●																○	
	**VNEG160408-NF**	16.6	9.525	4.76	3.81	0.8				●																○	
Finishing Schlichten																											
SF	**VNMG160404-SF**	16.6	9.525	4.76	3.81	0.4																					
	**VNMG160408-SF**	16.6	9.525	4.76	3.81	0.8																					
Finishing Schlichten																											

Tool holder / Klemmhalter

MVVNN
Kr:72°30'



MVJNR/L
Kr:93°



Page/Seite A181 A182

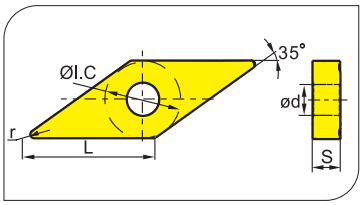
● Ex Stock / ab Lager ○ On demand / auf Anfrage

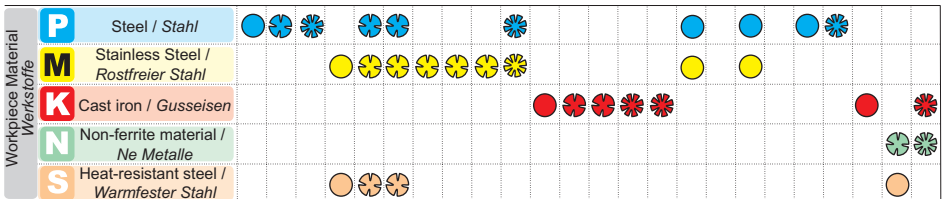
A

General Turning · Allgemeine Drehbearbeitung

VN** Negative Insert·Negative WSP

Ideal Machining Condition / Gute Bearbeitungsbedingungen
Normal Machining Condition / Normale Bearbeitungsbedingungen
Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen





Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall													Cermet unbeschichtet		Cermet Coated beschicht. Cerm.		Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151		YNG151C		YC10	YC40	YD051	YD101	YD201
PM	**VNMG160404-PM**	16.6	9.525	4.76	3.81	0.4	●	●	●									●											○
	VNMG160408-PM	16.6	9.525	4.76	3.81	0.8	●	●	●								●	●		●									○
Medium Cut/ Mittl. Bearb.	**VNMG160412-PM**	16.6	9.525	4.76	3.81	1.2		●	●								●	●	○										
DM	**VNMG160408-DM**	16.6	9.525	4.76	3.81	0.8	●	●	●						●														
	VNMG160412-DM	16.6	9.525	4.76	3.81	1.2		●																					
Medium Cut/ Mittl. Bearb.																													
EM	**VNMG160404-EM**	16.6	9.525	4.76	3.81	0.4					●	●																	
	VNMG160408-EM	16.6	9.525	4.76	3.81	0.8					●	●																	
Medium Cut/ Mittl. Bearb.																													
NM	**VNMG160412-NM**	16.6	9.525	4.76	3.81	1.2																							
Medium Cut/ Mittl. Bearb.																													
Basic	**VNMG160404**	16.6	9.525	4.76	3.81	0.4	○	○																					
	VNMG160408	16.6	9.525	4.76	3.81	0.8	○	○											○										

Tool holder / Klemmhalter





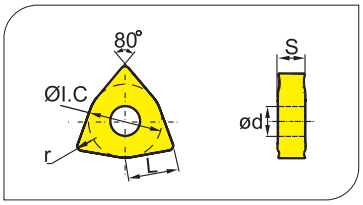
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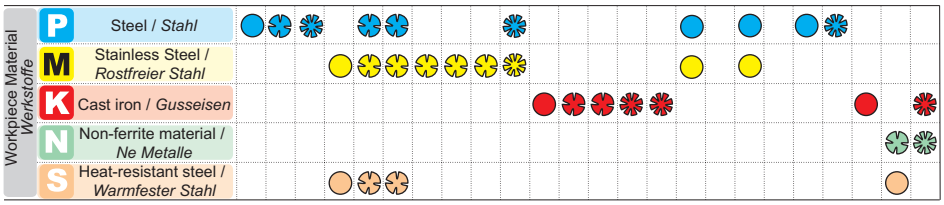
Insert code key ISO Code A42-A43
Grade selection reference Sortenauswahl A14/A31-A40
chip breaker selection reference Spanbrecherauswahl A24-A30
Recommended cutting parameters Empfohlene Schnittparameter A249-A253

A

WN** Negative Insert·Negative WSP

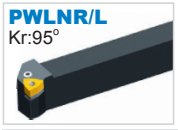
Ideal Machining Condition / Gute Bearbeitungsbedingungen
Normal Machining Condition / Normale Bearbeitungsbedingungen
Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen





Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall												Cermet unbeschichtet		Cermet Coated beschicht. Cerm.	Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151		YNG151C	YC10	YC40	YD051	YD101	YD201
DF  Finishing Schlichten	WNMG06T304-DF	6.5	9.525	3.97	3.81	0.4																						
	WNMG06T308-DF	6.5	9.525	3.97	3.81	0.8																						
	WNMG06T312-DF	6.5	9.525	3.97	3.81	1.2																						
	WNMG060404-DF	6.5	9.525	4.76	3.81	0.4	●	●						●	○													
	WNMG060408-DF	6.5	9.525	4.76	3.81	0.8	●	●					○	●	○													
	WNMG060412-DF	6.5	9.525	4.76	3.81	1.2	●																					
	WNMG080404-DF	8.7	12.7	4.76	5.16	0.4	●	●					○	●														
	WNMG080408-DF	8.7	12.7	4.76	5.16	0.8	●	●			○		○	●	○													
	WNMG080412-DF	8.7	12.7	4.76	5.16	1.2	●	●																				
WG  Wiper	WNMG060404-WG	6.5	9.525	4.76	3.81	0.4	○																					
	WNMG060408-WG	6.5	9.525	4.76	3.81	0.8	○																					
	WNMG060412-WG	6.5	9.525	4.76	3.81	1.2																						
	WNMG080404-WG	8.7	12.7	4.76	5.16	0.4	○																					
	WNMG080408-WG	8.7	12.7	4.76	5.16	0.8	●	●			●			●														
	WNMG080412-WG	8.7	12.7	4.76	5.16	1.2	●	●																				

Tool holder / Klemmhalter


PWLNR/L
Kr:95°


MWLNR/L
Kr:95°

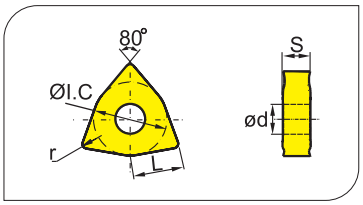

PWLNR/L
Kr:95°

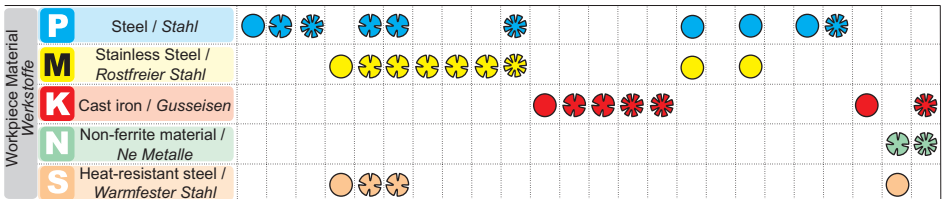
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● Ex Stock / ab Lager ○ On demand / auf Anfrage

WN** Negative Insert·Negative WSP

Ideal Machining Condition / Gute Bearbeitungsbedingungen
Normal Machining Condition / Normale Bearbeitungsbedingungen
Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen





Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall												Cermet unbeschichtet	Cermet Coated beschicht. Cerm.	Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151	YNG151C	YC10	YC40	YD051	YD101	YD201
SF	WNMG06T304-SF	6.5	9.525	3.97	3.81	0.4																					
	WNMG06T308-SF	6.5	9.525	3.97	3.81	0.8																					
	WNMG06T312-SF	6.5	9.525	3.97	3.81	1.2																					
	WNMG060404-SF	6.5	9.525	4.76	3.81	0.4																	●				
	WNMG060408-SF	6.5	9.525	4.76	3.81	0.8																	●				
	WNMG080404-SF	8.7	12.7	4.76	5.16	0.4																	●				
	WNMG080408-SF	8.7	12.7	4.76	5.16	0.8																	●				
	WNMG080412-SF	8.7	12.7	4.76	5.16	1.2																					
EF	WNMG06T304-EF	6.5	9.525	3.97	3.81	0.4																					
	WNMG06T308-EF	6.5	9.525	3.97	3.81	0.8																					
	WNMG06T312-EF	6.5	9.525	3.97	3.81	1.2																					
	WNMG060404-EF	6.5	9.525	4.76	3.81	0.4					●	○		●													
	WNMG060408-EF	6.5	9.525	4.76	3.81	0.8					●	○		●	○												
	WNMG080404-EF	8.7	12.7	4.76	5.16	0.4		●			●	○		●	●												
	WNMG080408-EF	8.7	12.7	4.76	5.16	0.8		●		●	●	●	○	●	●												
NF	WNEG080404-NF	8.7	12.7	4.76	5.16	0.4				●																	
	WNEG080408-NF	8.7	12.7	4.76	5.16	0.8																					

Tool holder / Klemmhalter





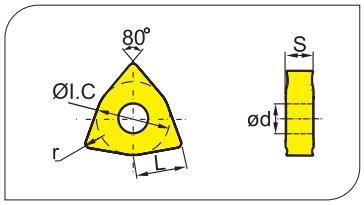


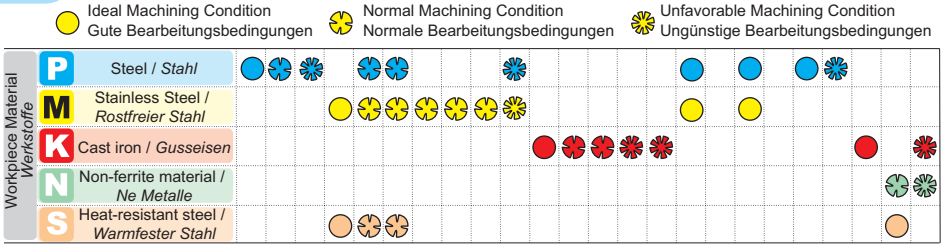
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Insert code key ISO Code A42-A43
Grade selection reference Sortenauswahl A14/A31-A40
chip breaker selection reference Spanbrecherauswahl A24-A30
Recommended cutting parameters Empfohlene Schnittparameter A249-A253

A

WN** Negative Insert·Negative WSP





Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall												Cermet unbeschichtet		Cermet Coated beschicht. Cerm.	Uncoated Carbide unbeschicht. Hartmetall					
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151		YNG151C	YC10	YC40	YD051	YD101	YD201
PM	WNMG060408-PM	6.5	9.525	4.76	3.81	0.8	●	●									●	●		●								
	WNMG060412-PM	6.5	9.525	4.76	3.81	1.2	●	●									●	●		●								
	WNMG080404-PM	8.7	12.7	4.76	5.16	0.4	●	●	○								●	●		●								
	WNMG080408-PM	8.7	12.7	4.76	5.16	0.8	●	●	●								●	●		●								
	WNMG080412-PM	8.7	12.7	4.76	5.16	1.2	●	●	●								●	●		●								
	WNMG080416-PM	8.7	12.7	4.76	5.16	1.6		●	○								○	○		●								
DM	WNMG06T304-DM	6.5	9.525	3.97	3.81	0.4																						
	WNMG06T308-DM	6.5	9.525	3.97	3.81	0.8																						
	WNMG06T312-DM	6.5	9.525	3.97	3.81	1.2																						
	WNMG060408-DM	6.5	9.525	4.76	3.81	0.8	●	●	○					●	●	○												
	WNMG060412-DM	6.5	9.525	4.76	3.81	1.2	●	●	○																			
	WNMG080404-DM	8.7	12.7	4.76	5.16	0.4	●	●	●						●	○												
	WNMG080408-DM	8.7	12.7	4.76	5.16	0.8	●	●	●					○	●	○												
	WNMG080412-DM	8.7	12.7	4.76	5.16	1.2	●	●	●					○	●	○												
	WNMG080416-DM	8.7	12.7	4.76	5.16	1.6		○																				
EM	WNMG06T304-EM	6.5	9.525	3.97	3.81	0.4																						
	WNMG06T308-EM	6.5	9.525	3.97	3.81	0.8																						
	WNMG06T312-EM	6.5	9.525	3.97	3.81	1.2																						
	WNMG060404-EM	6.5	9.525	4.76	3.81	0.4					●				○													
	WNMG060408-EM	6.5	9.525	4.76	3.81	0.8					●				●													
	WNMG080404-EM	8.7	12.7	4.76	5.16	0.4					●	●		●	●													
	WNMG080408-EM	8.7	12.7	4.76	5.16	0.8					●	●		●	●	●												
	WNMG080412-EM	8.7	12.7	4.76	5.16	1.2					●	○																

Tool holder / Klemmhalter





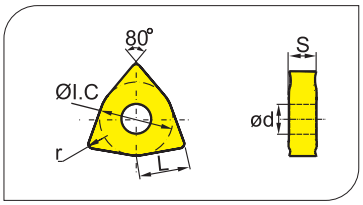


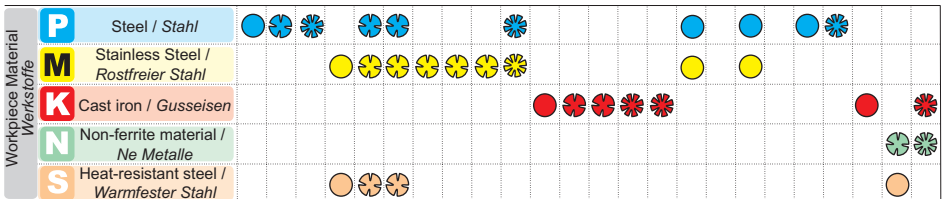
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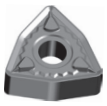
● Ex Stock / ab Lager ○ On demand / auf Anfrage

WN** Negative Insert·Negative WSP

Ideal Machining Condition / Gute Bearbeitungsbedingungen
Normal Machining Condition / Normale Bearbeitungsbedingungen
Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen





Insert Shape Schneidplattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall												Cermet unbeschichtet	Cermet Coated beschicht. Cerm.	Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151	YNG151C	YC10	YC40	YD051	YD101	YD201
NM	**WNMG080408-NM**	8.7	12.7	4.76	5.16	0.8				●		○															
	**WNMG080412-NM**	8.7	12.7	4.76	5.16	1.2				●		○															
Medium Cut/ Mittl. Bearb.																											
DR	**WNMG060408-DR**	6.5	9.525	4.76	3.81	0.8	●	●	○									●		●							
	**WNMG060412-DR**	6.5	9.525	4.76	3.81	1.2	●	●	○									●		●							
	WNMG080408-DR	8.7	12.7	4.76	5.16	0.8	●	●	●									●		●							
Roughing/ Schruppen	**WNMG080412-DR**	8.7	12.7	4.76	5.16	1.2	●	●	●									●		●							
	WNMG080416-DR	8.7	12.7	4.76	5.16	1.6	●	●										●		○							
Flat	**WNMA06T308**	6.5	9.525	3.97	3.81	0.8																					
	WNMA060404	6.5	9.525	4.76	3.81	0.4																					
	WNMA060408	6.5	9.525	4.76	3.81	0.8									●			●		●							
	WNMA060412	6.5	9.525	4.76	3.81	1.2																					
	**WNMA080404**	8.7	12.7	4.76	5.16	0.4									○			○									
	WNMA080408	8.7	12.7	4.76	5.16	0.8									●			●		●							
	WNMA080412	8.7	12.7	4.76	5.16	1.2									●			●		●							
	WNMA080416	8.7	12.7	4.76	5.16	1.6									○			○		○							

Tool holder / Klemmhalter

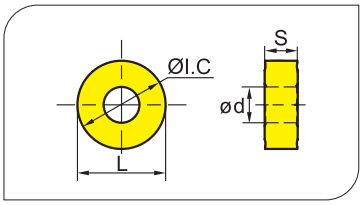
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Page/Seite A169	A183	A223

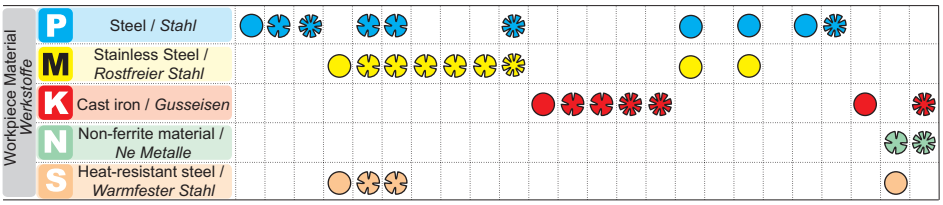
Insert code key ISO Code A42-A43
Grade selection reference Sortenauswahl A14/A31-A40
chip breaker selection reference Spanbrecherauswahl A24-A30
Recommended cutting parameters Empfohlene Schnittparameter A249-A253

A

RN** Negative Insert·Negative WSP

Ideal Machining Condition / Gute Bearbeitungsbedingungen
Normal Machining Condition / Normale Bearbeitungsbedingungen
Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen





Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall												Cermet unbeschichtet		Cermet Coated beschicht. Cerm.	Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151		YNG151C	YC10	YC40	YD051	YD101	YD201
Basic 	**RNMG120400**	12.7	12.7	4.76	5.16		●	●																				

Tool holder / Klemmhalter



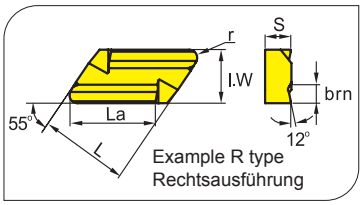


Page/Seite A184 A184

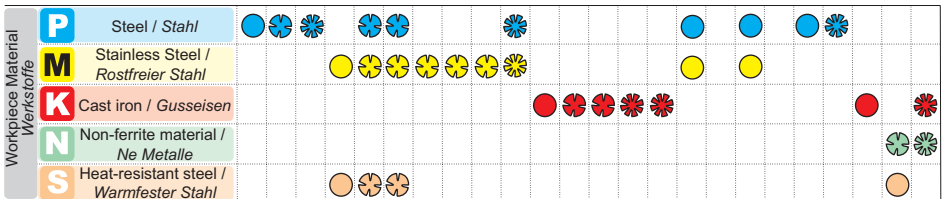
● Ex Stock / ab Lager ○ On demand / auf Anfrage

KN** Negative insert/ Negative Inserts

Ideal Machining Condition / Gute Bearbeitungsbedingungen
Normal Machining Condition / Normale Bearbeitungsbedingungen
Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen



Example R type
Rechtsausführung



Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung						Coated Carbide Beschichtetes Hartmetall												Cermet unbeschichtet		Cermet Coated beschicht. Cerm.		Uncoated Carbide unbeschicht. Hartmetall				
		La	L	l.W	S	brn	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151		YNG151C		YC10	YC40	YD051	YD101	YD201
KNUX	**KNUX160405L11**	16	16.15	9.525	4.76	2.2	0.5	●	●	●						●	●										●				●
	KNUX160410L11	16	16.15	9.525	4.76	2.2	1.0	●	●							●											●				
	KNUX160405L12	16	16.15	9.525	4.76	2.2	0.5	●	●							●											○				
	KNUX160410L12	16	16.15	9.525	4.76	2.2	1.0	●	●							●											○				○
	KNUX160405R11	16	16.15	9.525	4.76	2.2	0.5	●	●	●						●	●										●				●
Finishing/ Schlichten	**KNUX160410R11**	16	16.15	9.525	4.76	2.2	1.0	●	●							●											●				
	KNUX160405R12	16	16.15	9.525	4.76	2.2	0.5	●	●							●															
	KNUX160410R12	16	16.15	9.525	4.76	2.2	0.5	●	●							●															

Tool holder / Klemmhalter


CKJNR/L
Kr:93°


CKNNR/L
Kr:63°

Page/Seite A203 A203

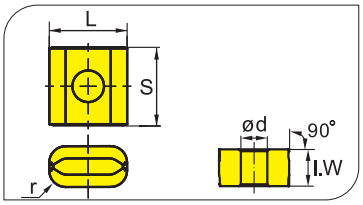
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chip breaker selection reference Spanbrecherauswahl A24-A30
Recommended cutting parameters Empfohlene Schnittparameter A249-A253

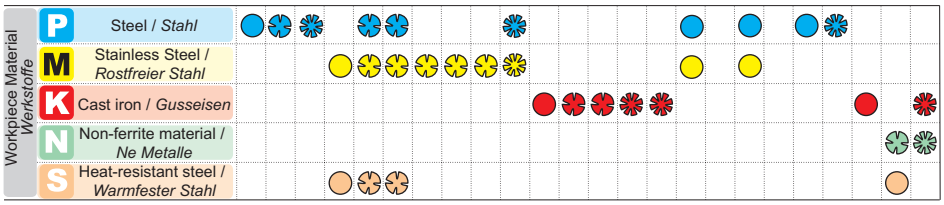
A

General Turning · Allgemeine Drehbearbeitung

Railway Wheel Machining/ Radsatz Bearbeitung

Ideal Machining Condition / Gute Bearbeitungsbedingungen
Normal Machining Condition / Normale Bearbeitungsbedingungen
Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen



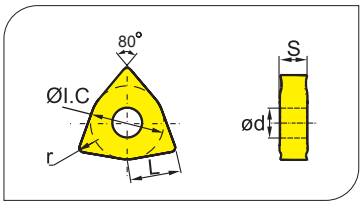


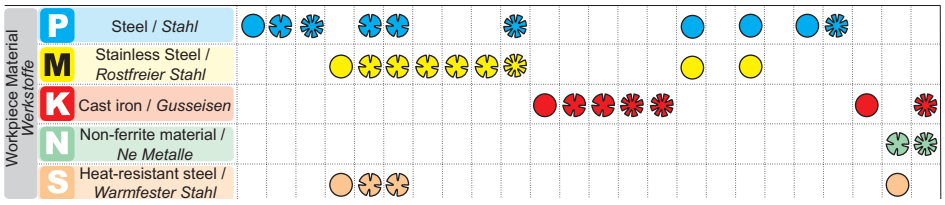
Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall														Cermet unbeschichtet		Cermet Coated beschicht. Cerm.		Uncoated Carbide unbeschicht. Hartmetall				
		L	l.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151		YNG151C		YC10	YC40	YD051	YD101	YD201
 Railway Wheel Machining/ Radsatz Bearb.	**175.32-191940-22**	19.05	10	19.05	6.35	4.0		●																					
	175.32-191940-227	19.05	10	19.05	7.2	4.0		●																					
 Railway Wheel Machining/ Radsatz Bearb.	**175.32-191940-24**	19.05	10	19.05	6.35	4.0	○	●																					
	175.32-301940-24	30	10	19.05	6.35	4.0	○	●																					
 Railway Wheel Machining/ Radsatz Bearb.	**175.32-191940-25**	19.05	10	19.05	6.35	4.0		●																					
 Railway Wheel Machining/ Radsatz Bearb.	**175.32-191940-28**	19.05	10	19.05	6.35	4.0																							
	175.32-30194031	30	10	19.05	6.35	4.0		●																					

● Ex Stock / ab Lager ○ On demand / auf Anfrage

TN** Negative Insert/ Negative WSP

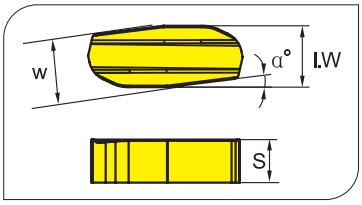
Ideal Machining Condition / Gute Bearbeitungsbedingungen
Normal Machining Condition / Normale Bearbeitungsbedingungen
Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen

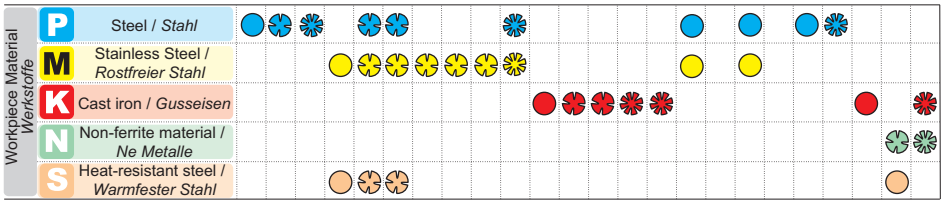




Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung L	I.C	S	d	r	Coated Carbide Beschichtetes Hartmetall YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	Cermet unbeschichtet YNG151	Cermet Coated beschicht. Cerm. YNG151C	Uncoated Carbide unbeschicht. Hartmetall YC10	YC40	YD051	YD101	YD201
Basic	**TNMX1106-2**	11.3	15.875	6.35	6.35	1.6	○	●																				
	TNMX1509-2	15.9	22.225	9.52	7.94	1.6																			○		○	
	TNMX15T916-2	15.9	22.225	9.72	7.94	1.6		○																				

Ideal Machining Condition / Gute Bearbeitungsbedingungen
Normal Machining Condition / Normale Bearbeitungsbedingungen
Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen





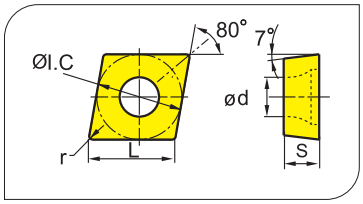
Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung L	I.C	S	d	r	Coated Carbide Beschichtetes Hartmetall YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBD052	YBD102	YBD151	YBD152	YBD252	Cermet YNG151	Coated Beschicht. YNG151C	Uncoated Carbide unbeschicht. Hartmetall YC10	YC40	YD051	YD101	YD201
	YNMX1812L	18	22	12	20°																						
	YNMX2518173L	25	25	18	7°																						
	YNUX1812150L	18	18	12	15°																						

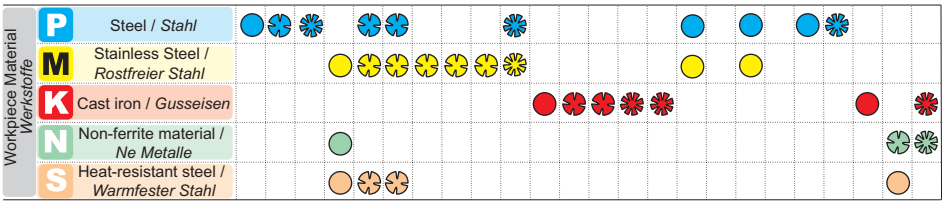
Insert code key ISO Code A42-A43
Grade selection reference Sortenauswahl A14/A31-A40
chip breaker selection reference Spanbrecherauswahl A24-A30
Recommended cutting parameters Empfohlene Schnittparameter A249-A253

A

CC** Positive Insert/ Positive WSP

Ideal Machining Condition / Gute Bearbeitungsbedingungen
Normal Machining Condition / Normale Bearbeitungsbedingungen
Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen





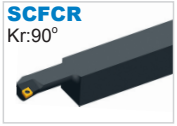
Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall														Cermet unbeschichtet		Cermet Coated beschicht. Cerm.		Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151		YNG151C		YC10	YC40	YD051	YD101	YD201
SF	CCGT060202-SF	6.4	6.35	2.38	2.8	0.2															●		●						
	CCGT060204-SF	6.4	6.35	2.38	2.8	0.4															●		●						
	CCGT09T304-SF	9.7	9.525	3.97	4.4	0.4															●		●						
Finishing Schlichten																													
HF	CCMT060202-HF	6.4	6.35	2.38	2.8	0.2	●	●			●											●								○
	CCMT060204-HF	6.4	6.35	2.38	2.8	0.4	●	●	●		●			○						○		●								
	CCMT060208-HF	6.4	6.35	2.38	2.8	0.8	○	●														●		●						
	CCMT09T302-HF	9.7	9.525	3.97	4.4	0.2		●			●											●		●						
	CCMT09T304-HF	9.7	9.525	3.97	4.4	0.4	●	●	●		●			●				●		●		●		●						○
	CCMT09T308-HF	9.7	9.525	3.97	4.4	0.8	●	●	○					●				○		●		○								○
Finishing Schlichten	CCMT120404-HF	12.9	12.7	4.76	5.56	0.4	●	●						○					●			●								
	CCMT120408-HF	12.9	12.7	4.76	5.56	0.8	○	○																						
	CPGT050204	5.6	5.56	2.38	2.8	0.4																								

Tool holder / Klemmhalter









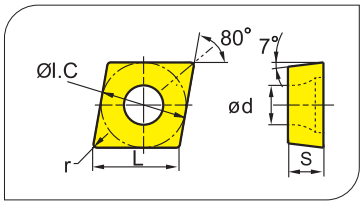


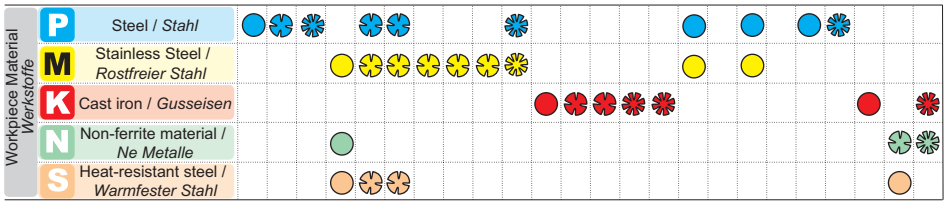
Page/Seite A185 A186 A224 A239 A240

● Ex Stock / ab Lager ○ On demand / auf Anfrage

CC** Positive Insert/ Positive WSP

Ideal Machining Condition / Gute Bearbeitungsbedingungen
Normal Machining Condition / Normale Bearbeitungsbedingungen
Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen





Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall												Cermet unbeschichtet		Cermet Coated beschicht. Cerm.	Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151		YNG151C	YC10	YC40	YD051	YD101	YD201
EF	CCMT060202-EF	6.4	6.35	2.38	2.8	0.2						●																
	CCMT060204-EF	6.4	6.35	2.38	2.8	0.4					○	●																
	CCMT09T302-EF	9.7	9.525	3.97	4.4	0.2						●																
	CCMT09T304-EF	9.7	9.525	3.97	4.4	0.4					○	●																
Finishing Schlichten	CCMT09T308-EF	9.7	9.525	3.97	4.4	0.8						●																
	CCMT120404-EF	12.9	12.7	4.76	5.56	0.4						●																
	CCMT120408-EF	12.9	12.7	4.76	5.56	0.8						●																
HM	CCMT060204-HM	6.4	6.35	2.38	2.8	0.4	●	●	●		●			○	●			●	○	●								●
	CCMT060208-HM	6.4	6.35	2.38	2.8	0.8	●	●	●					○	●	○		●		●								
	CCMT09T304-HM	9.7	9.525	3.97	4.4	0.4	●	●	●		●			○	●	○		●		●								
	CCMT09T308-HM	9.7	9.525	3.97	4.4	0.8	●	●	●		●			●	●	○		●		●								●
Medium Cut/ Mittl. Bearb.	CCMT120404-HM	12.9	12.7	4.76	5.56	0.4	●	●	●		●			○	●	○		●		●								
	CCMT120408-HM	12.9	12.7	4.76	5.56	0.8	●	●	●		●			●	●			●		●								
	CCMT120412-HM	12.9	12.7	4.76	5.56	1.2		●										○										
EM	CCMT060204-EM	6.4	6.35	2.38	2.8	0.4					○	●																
	CCMT060208-EM	6.4	6.35	2.38	2.8	0.8					○	●																
	CCMT09T304-EM	9.7	9.525	3.97	4.4	0.4					○	●		○	○													
	CCMT09T308-EM	9.7	9.525	3.97	4.4	0.8					○	●			○													
Medium Cut/ Mittl. Bearb.	CCMT120404-EM	12.9	12.7	4.76	5.56	0.4					○	●																
	CCMT120408-EM	12.9	12.7	4.76	5.56	0.8					○	●																
	CCMT120412-EM	12.9	12.7	4.76	5.56	1.2					○	○																

Tool holder / Klemmhalter











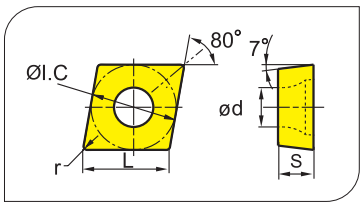
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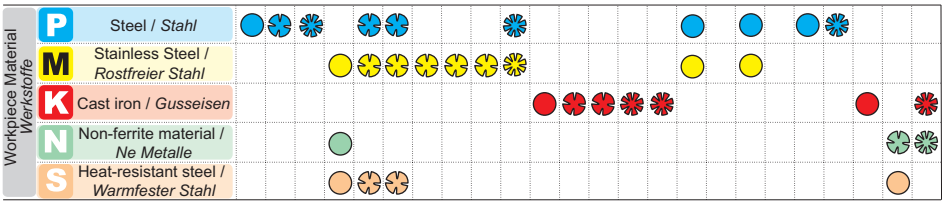
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Grade selection reference Sortenauswahl A14/A31-A40
chip breaker selection reference Spanbrecherauswahl A24-A30
Recommended cutting parameters Empfohlene Schnittparameter A249-A253

A

CC** Positive Insert/ Positive WSP

Ideal Machining Condition / Gute Bearbeitungsbedingungen
Normal Machining Condition / Normale Bearbeitungsbedingungen
Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen





Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall												Cermet unbeschichtet		Cermet Coated beschicht. Cerm.		Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151		YNG151C		YC10	YC40	YD051	YD101	YD201
HR	CCMT060204-HR	6.4	6.35	2.38	2.8	0.4	●	○	○																				○
	CCMT060208-HR	6.4	6.35	2.38	2.8	0.8	○	●	○											○									
	CCMT09T304-HR	9.7	9.525	3.97	4.4	0.4	●	●	●																				
	CCMT09T308-HR	9.7	9.525	3.97	4.4	0.8	●	●	●					●	●		●	●	○	●									●
Roughing/ Schruppen	CCMT120408-HR	12.9	12.7	4.76	5.56	0.8	●	●	●					●	●		●	●	●	●		○							●
	CCMT120412-HR	12.9	12.7	4.76	5.56	1.2	○	●	○					○	○		○	●	○										
LH	CCGX060202-LH	6.4	6.35	2.38	2.8	0.2				●																		●	
	CCGX060204-LH	6.4	6.35	2.38	2.8	0.4				●																		●	
	CCGX060208-LH	6.4	6.35	2.38	2.8	0.8																						●	
	CCGX09T302-LH	9.7	9.525	3.97	4.4	0.2				●																		●	
	CCGX09T304-LH	9.7	9.525	3.97	4.4	0.4				●																		●	
Aluminium Machining/ Aluminium-bearbeitung	CCGX09T308-LH	9.7	9.525	3.97	4.4	0.8				●																		●	
	CCGX120402-LH	12.9	12.7	4.76	5.56	0.2				●																		●	
	CCGX120404-LH	12.9	12.7	4.76	5.56	0.4				●																		●	
	CCGX120408-LH	12.9	12.7	4.76	5.56	0.8				●	○																	●	
	CCGX120412-LH	12.9	12.7	4.76	5.56	1.2				●																		●	
Basic	CCMW060204	6.4	6.35	2.38	2.8	0.4	○																				○	●	
	CCMW09T304	9.7	9.525	3.97	4.4	0.4	○												○									●	○
	CCMW09T308	9.7	9.525	3.97	4.4	0.8	○												○									●	
	CCMW120404	12.9	12.7	4.76	5.56	0.4	○												○									●	
	CCMW120408	12.9	12.7	4.76	5.56	0.8	○																					○	

Tool holder / Klemmhalter


SCACR/L Kr:90°


SCLCR/L Kr:95°


SCLCR/L Kr:95°


SCFCR Kr:90°


SCLCR Kr:95°

Page/Seite A185 A186 A224 A239 A240

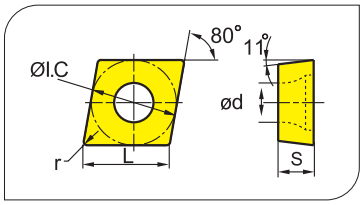
● Ex Stock / ab Lager ○ On demand / auf Anfrage

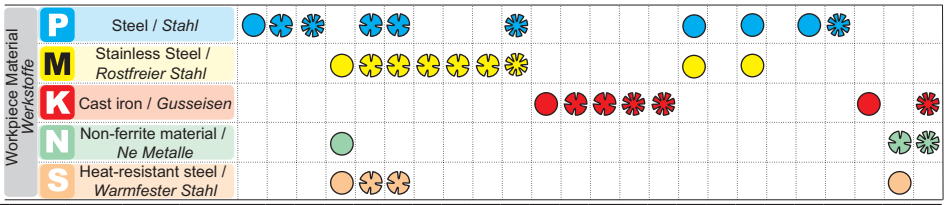
CP** Positive Insert/ Positive WSP

Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen





Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall											Cermet unbeschichtet	Cermet Coated beschicht. Cerm.	Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151	YNG151C	YC10	YC40	YD051	YD101	YD201
SF  Finishing Schlichten	**CPGT060202-SF**	6.4	6.35	2.38	2.8	0.2																●	●					
	CPGT060204-SF	6.4	6.35	2.38	2.8	0.4																●	●					
	CPGT09T304-SF	9.7	9.525	3.97	4.4	0.4																●	●					
Flat 	**CPGW060204**	6.4	6.35	2.38	2.8	0.4																				●		

Tool holder / Klemmhalter

SCLPR/L
Kr:95°

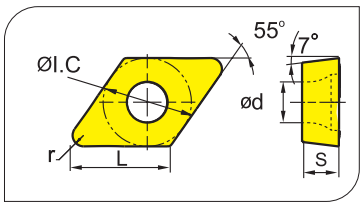


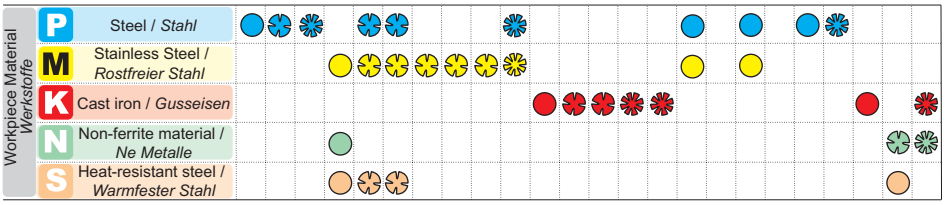
Page/Seite A235

Insert code key ISO Code A42-A43
Grade selection reference Sortenauswahl A14/A31-A40
chip breaker selection reference Spanbrecherauswahl A24-A30
Recommended cutting parameters Empfohlene Schnittparameter A249-A253

DC** Positive Insert/ Positive WSP

Ideal Machining Condition / Gute Bearbeitungsbedingungen
Normal Machining Condition / Normale Bearbeitungsbedingungen
Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen





Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall												Cermet unbeschichtet		Cermet Coated beschicht. Cerm.	Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151		YNG151C	YC10	YC40	YD051	YD101	YD201
SF	DCGT070202-SF	7.8	6.35	2.38	2.8	0.2																●		●					
	DCGT070204-SF	7.8	6.35	2.38	2.8	0.4																●		●					
	DCGT070208-SF	7.8	6.35	2.38	2.8	0.8																○		●					
	DCGT11T302-SF	11.6	9.525	3.97	4.4	0.2																○		●					
Finishing Schlichten	DCGT11T304-SF	11.6	9.525	3.97	4.4	0.4																●		●					
	DCGT11T308-SF	11.6	9.525	3.97	4.4	0.8																●		●					
HF	DCMT070202-HF	7.8	6.35	2.38	2.8	0.2	●	●			●											●		○					
	DCMT070204-HF	7.8	6.35	2.38	2.8	0.4	●	●	●		●			●								●		○					
	DCMT070208-HF	7.8	6.35	2.38	2.8	0.8	○	○														●		○					
	DCMT11T302-HF	11.6	9.525	3.97	4.4	0.2		●			●											●		●					●
Finishing Schlichten	DCMT11T304-HF	11.6	9.525	3.97	4.4	0.4	●	●	○		●			○	●			○		○		●		●					●
	DCMT11T308-HF	11.6	9.525	3.97	4.4	0.8	●	●						○				●				●		●					

Tool holder / Klemmhalter


SDACR/L
Kr:90°


SDJCR/L
Kr:93°


SDNCN
Kr:45°


SDQCR/L
Kr:107°30'


SDUCR/L
Kr:93°

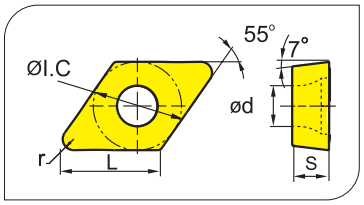

SDZCR/L
Kr:85°

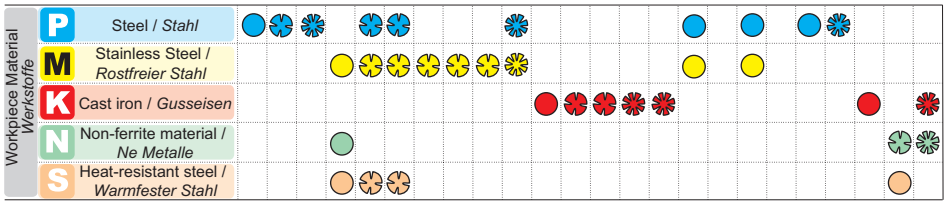
Page/Seit A187 A188 A189 A226 A227 A228

● Ex Stock / ab Lager ○ On demand / auf Anfrage

DC** Positive Insert/ Positive WSP

Ideal Machining Condition / Gute Bearbeitungsbedingungen
Normal Machining Condition / Normale Bearbeitungsbedingungen
Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen





Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall												Cermet unbeschichtet		Cermet Coated beschicht. Cerm.		Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151		YNG151C		YC10	YC40	YD051	YD101	YD201
EF	DCMT070202-EF	7.8	6.35	2.38	2.8	0.2						●																	
	DCMT070204-EF	7.8	6.35	2.38	2.8	0.4					○	●																	
	DCMT11T302-EF	11.6	9.525	3.97	4.4	0.2						●																	
Finishing Schlichten	DCMT11T304-EF	11.6	9.525	3.97	4.4	0.4					○	●																	
	DCMT11T308-EF	11.6	9.525	3.97	4.4	0.8						●																	
HM	DCMT070204-HM	7.8	6.35	2.38	2.8	0.4	●	●	●		●				●	○		●		●									○
	DCMT070208-HM	7.8	6.35	2.38	2.8	0.8	●	●	●		○				●			●		●									
	DCMT11T304-HM	11.6	9.525	3.97	4.4	0.4	●	●	●		●			●	●	○		●		●									○
Medium Cut/ Mittl. Bearb.	DCMT11T308-HM	11.6	9.525	3.97	4.4	0.8	●	●	●		●			●	●	○		●		●									○
	DCMT11T312-HM	11.6	9.525	3.97	4.4	1.2	○	●	○						○			○											
EM	DCMT070204-EM	7.8	6.35	2.38	2.8	0.4					○	●																	
	DCMT070208-EM	7.8	6.35	2.38	2.8	0.8						○																	
	DCMT11T304-EM	11.6	9.525	3.97	4.4	0.4					○	●		○	○														
Medium Cut/ Mittl. Bearb.	DCMT11T308-EM	11.6	9.525	3.97	4.4	0.8					○	●																	

Tool holder / Klemmhalter













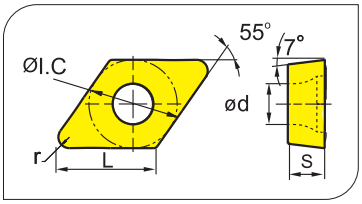
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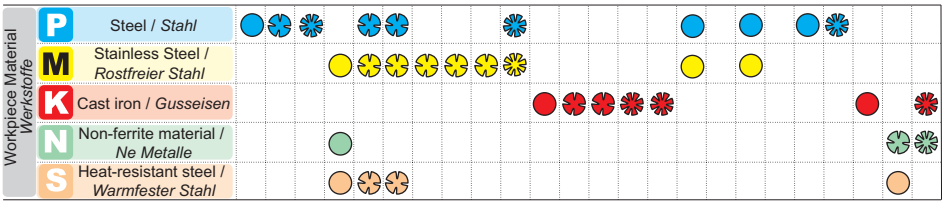
Insert code key ISO Code A42-A43
Grade selection reference Sortenauswahl A14/A31-A40
chip breaker selection reference Spanbrecherauswahl A24-A30
Recommended cutting parameters Empfohlene Schnittparameter A249-A253

A

DC** Positive Insert/ Positive WSP

Ideal Machining Condition / Gute Bearbeitungsbedingungen
Normal Machining Condition / Normale Bearbeitungsbedingungen
Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen



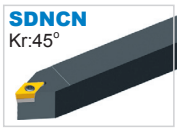


Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall											Cermet unbeschichtet		Cermet Coated beschicht. Cerm.	Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151		YNG151C	YC10	YC40	YD051	YD101	YD201
HR	**DCMT11T304-HR**	11.6	9.525	3.97	4.4	0.4	●	●	○						●			●		○									
	DCMT11T308-HR	11.6	9.525	3.97	4.4	0.8	○	●	●					○	●	○	●	●	○										○
	DCMT11T312-HR	11.6	9.525	3.97	4.4	1.2		○							○		○	○											
Roughing/ Schruppen																													
LH	**DCGX070202-LH**	7.8	6.35	2.38	2.8	0.2				●	●																	●	
	DCGX070204-LH	7.8	6.35	2.38	2.8	0.4				●	●																	●	
	DCGX11T302-LH	11.6	9.525	3.97	4.4	0.2				●	●																	●	
	DCGX11T304-LH	11.6	9.525	3.97	4.4	0.4				●	●																	●	
	DCGX11T308-LH	11.6	9.525	3.97	4.4	0.8				●	●																	●	
Aluminium Machining/ Aluminium-bearbeitung																													
Flat	**DCMW070204**	7.8	6.35	2.38	2.8	0.4																							
	DCMW11T304	11.6	9.525	3.97	4.4	0.4	○											●	○			○							○
	DCMW11T308	11.6	9.525	3.97	4.4	0.8	○										●	○	○										○

Tool holder / Klemmhalter


SDACR/L
Kr:90°


SDJCR/L
Kr:93°


SDNCN
Kr:45°


SDQCR/L
Kr:107°30'

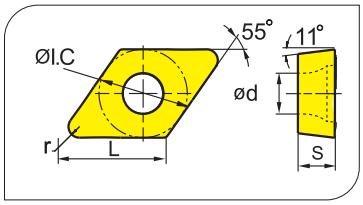

SDUCR/L
Kr:93°


SDZCR/L
Kr:85°

Page/Seite A187 A188 A189 A226 A227 A228

● Ex Stock / ab Lager ○ On demand / auf Anfrage

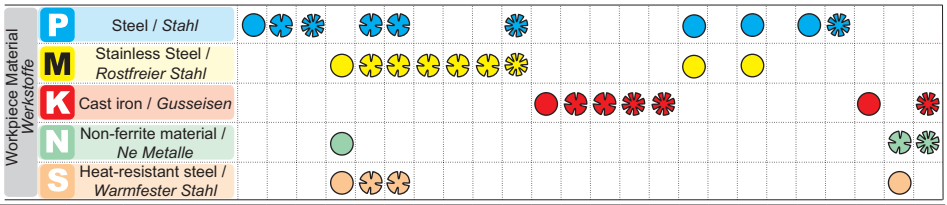
DP** Positive Insert/ Positive WSP



Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen



insert shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichte Hartmetal												Cermet unbeschichtet	Cermet Coated beschicht. Cerm.	carbide Hartmetal				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151	YNG151C	YC10	YC40	YD051	YD101	YD201
SF	DPGT070202-SF	7.8	6.35	2.38	2.8	0.2																●	●					
	DPGT070204-SF	7.8	6.35	2.38	2.8	0.4																●	●					
	DPGT070208-SF	7.8	6.35	2.38	2.8	0.8																	●					
Finishing Schlichten	DPGT11T304-SF	11.6	9.525	3.97	4.4	0.4																●	●					
	DPGT11T308-SF	11.6	9.525	3.97	4.4	0.8																●	●					
Basic	DPMW11T304	11.6	9.525	3.97	4.4	0.4																						
	DPMW11T308	11.6	9.525	3.97	4.4	0.8																					○	

Tool holder / Klemmhalter

SDQPR/L
Kr:107°30'



SDUPR/L
Kr:93°

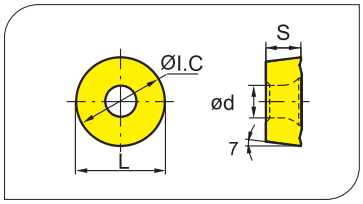


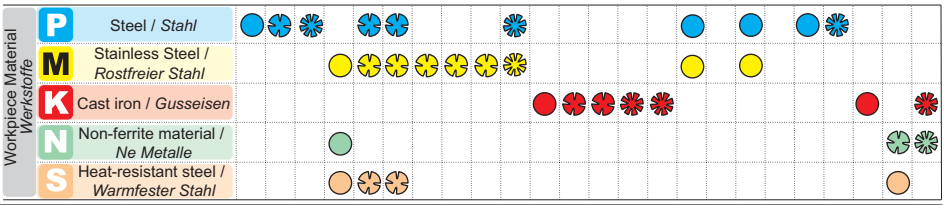
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Insert code key ISO Code A42-A43
Grade selection reference Sortenauswahl A14/A31-A40
chip breaker selection reference Spanbrecherauswahl A24-A30
Recommended cutting parameters Empfohlene Schnittparameter A249-A253

RC** Positive Insert/ Positive WSP

Ideal Machining Condition / Gute Bearbeitungsbedingungen
Normal Machining Condition / Normale Bearbeitungsbedingungen
Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen

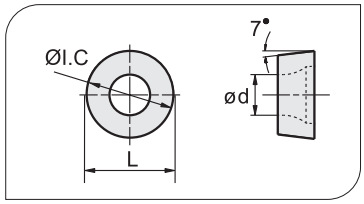


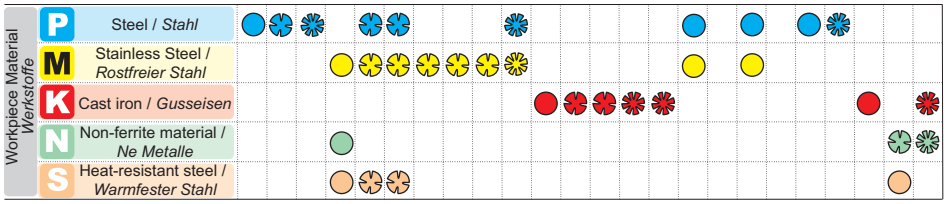


Insert Shape/ Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall												Cermet unbeschichtet	Cermet Coated beschicht. Cerm.	Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151	YNG151C	YC10	YC40	YD051	YD101	YD201
Basic	**RCGT1204MO**	12	12	4.76	4.4	\																					
	RCGT190600	19.05	19.05	6.35	6.55	\																					
	RCMT0803MO	8.0	8.0	3.18	3.36	\		●										●									
	RCMT10T3MO	10	10	3.97	3.6	\		●																			
	RCMT1204MO	12	12	4.76	4.4	\	●	●							●			●		●							
Medium cut. Mittl. Bearb.	**RCMT1606MO**	16	16	6.35	5.5	\	●	●	●							●		●									
	RCMT2006MO	20	20	6.35	6.5	\		●																			
	RCMT2507MO	25	25	7.94	7.7	\		●																			

RC** positive insert

Ideal Machining Condition / Gute Bearbeitungsbedingungen
Normal Machining Condition / Normale Bearbeitungsbedingungen
Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen





Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall												Cermet	Coated Beschicht.	Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151	YNG151C	YC10	YC40	YD051	YD101	YD201
LH	**RCGX0803MO-LH**	8.0	8.0	3.18	3.36	\																				●	
Aluminium Machining/ Aluminium-bearbeitung																											

Tool holder / Klemmhalter





Page/Seite A201 A202

● Ex Stock / ab Lager ○ On demand / auf Anfrage

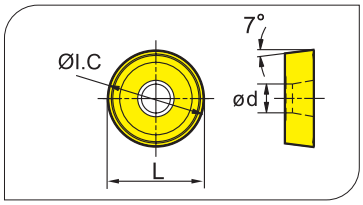
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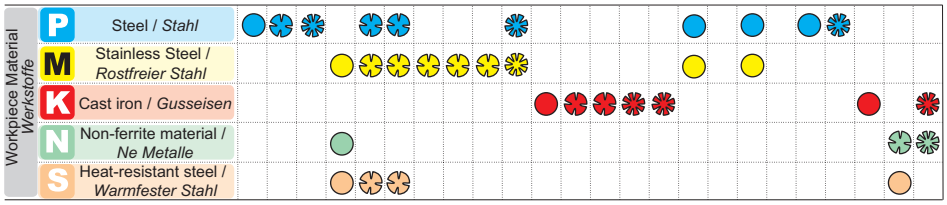
RC** Positive Insert/ Positive WSP

Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen





Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall													Cermet unbeschichtet		Cermet Coated beschicht. Cerm.		Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151		YNG151C		YC10	YC40	YD051	YD101	YD201
Basic	**RCMX0803MO**	8.0	8.0	3.18	3.36	\	○	●	○																				
	RCMX1003MO	10	10	3.18	3.6	\	●	●	●																				
	RCMX1204MO	12	12	4.76	4.4	\	●	●	●											○						○			
	RCMX1606MO	16	16	6.35	5.5	\	●	●	●										○							○			
	RCMX2006MO	20	20	6.35	6.5	\	●	●	●						●					●								○	○
	RCMX2507MO	25	25	7.94	7.2	\	○	●	●																				
	RCMX3209MO	32	32	9.52	9.5	\	○	●	●										○										
	RCMX3209MO-PV	32	32	9.52	9.5	\		●																					



Light roughing
Leicht Schruppen

Tool holder / Klemmhalter

SRDCN



SRGCR/L



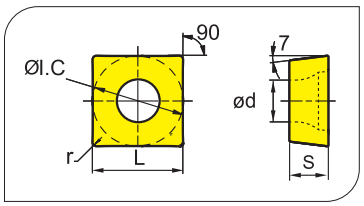
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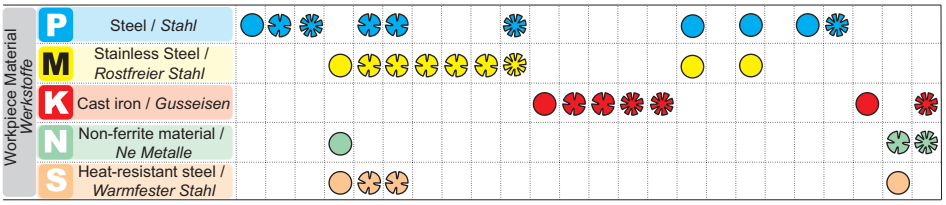
Insert code key ISO Code A42-A43
Grade selection reference Sortenauswahl A14/A31-A40
chip breaker selection reference Spanbrecherauswahl A24-A30
Recommended cutting parameters Empfohlene Schnittparameter A249-A253

A

CC** Positive Insert/ Positive WSP

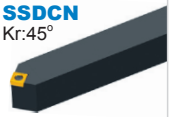
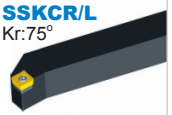
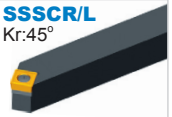
Ideal Machining Condition / Gute Bearbeitungsbedingungen
Normal Machining Condition / Normale Bearbeitungsbedingungen
Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen





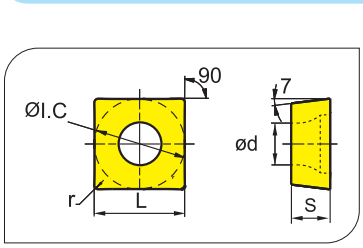
Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall													Cermet unbeschichtet		Cermet Coated beschicht. Cerm.		Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151		YNG151C		YC10	YC40	YD051	YD101	YD201
HF  Finishing Schlichten	**SCMT09T302-HF**	9.525	9.525	3.97	4.4	0.2	●	●																					
	SCMT09T304-HF	9.525	9.525	3.97	4.4	0.4	●	●			●																		
	SCMT09T308-HF	9.525	9.525	3.97	4.4	0.8	●	●			●			●															
EF  Finishing Schlichten	**SCMT09T302-EF**	9.525	9.525	3.97	4.4	0.2						○																	
	SCMT09T304-EF	9.525	9.525	3.97	4.4	0.4						●																	
	SCMT09T308-EF	9.525	9.525	3.97	4.4	0.8						●																	
HM  Medium Cut/ Mittl. Bearb.	**SCMT09T304-HM**	9.525	9.525	3.97	4.4	0.4	●	●	●						●			●	●										○
	SCMT09T308-HM	9.525	9.525	3.97	4.4	0.8	●	●	●		●			○	●			●	●										●
	SCMT120404-HM	12.7	12.7	4.76	5.56	0.4	●	●											●										
	SCMT120408-HM	12.7	12.7	4.76	5.56	0.8	●	●	●		○				●			●	●										●
	SCMT120412-HM	12.7	12.7	4.76	5.56	1.2	○	●																					
EM  Finishing Schlichten	**SCMT09T304-EM**	9.525	9.525	3.97	4.4	0.4						●																	
	SCMT09T308-EM	9.525	9.525	3.97	4.4	0.8						●																	
	SCMT120404-EM	12.7	12.7	4.76	5.56	0.4						●																	
	SCMT120408-EM	12.7	12.7	4.76	5.56	0.8						●																	
	SCMT120412-EM	12.7	12.7	4.76	5.56	1.2						○																	

Tool holder / Klemmhalter

SSBCR/L Kr:75°	**SSDCN** Kr:45°	**SSKCR/L** Kr:75°	**SSSCR/L** Kr:45°	**SSKCR/L** Kr:75°
				
Page/Seite A195	A195	A196	A196	A229

● Ex Stock / ab Lager ○ On demand / auf Anfrage

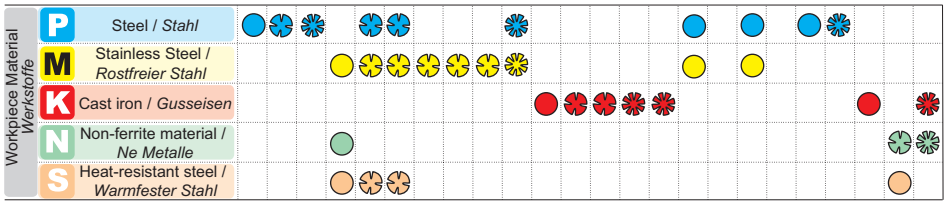
SC** Positive Insert/ Positive WSP



Ideal Machining Condition
Gute Bearbeitungsbedingungen

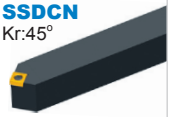
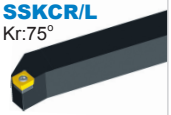
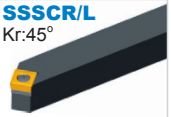
Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen



insert shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichte Hartmetal														Cermet unbeschichtet		Cermet Coated beschicht. Cerm.		carbide Hartmetal				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151		YNG151C		YC10	YC40	YD051	YD101	YD201
LH  Aluminium Machining/ Aluminium-bearbeitung	**SCGX09T302-LH**	9.525	9.525	3.97	4.4	0.2																						●	
	SCGX09T304-LH	9.525	9.525	3.97	4.4	0.4																						●	
	SCGX09T308-LH	9.525	9.525	3.97	4.4	0.8																						●	
	SCGX120404-LH	12.7	12.7	4.76	5.56	0.4																							
	SCGX120408-LH	12.7	12.7	4.76	5.56	0.8																						●	
HR  Roughing/ Schruppen	**SCMT09T304-HR**	9.525	9.525	3.97	4.4	0.4		○												○									
	SCMT09T308-HR	9.525	9.525	3.97	4.4	0.8	○	●										●		●									
	SCMT09T312-HR	9.525	9.525	3.97	4.4	1.2	○	○																					
	SCMT120404-HR	12.7	12.7	4.76	5.56	0.4	●	●																					
	SCMT120408-HR	12.7	12.7	4.76	5.56	0.8	○	●	●								○	●											
	SCMT120412-HR	12.7	12.7	4.76	5.56	1.2		●	○								○	●		●									
Basic 	**SCMT09T304**	9.525	9.525	3.97	4.4	0.4	○	○																					○
	SCMT120404	12.7	12.7	4.76	5.56	0.4	○	○	○																				
	SCMT120408	12.7	12.7	4.76	5.56	0.8																							
Flat 	**SCMW060204**	6.35	6.35	2.38	2.8	0.4													○			○							●
	SCMW09T304	9.525	9.525	3.97	4.4	0.4																			○		○		
	SCMW09T308	9.525	9.525	3.97	4.4	0.8													○										
	SCMW120408	12.7	12.7	4.76	5.56	0.8													○			○							○

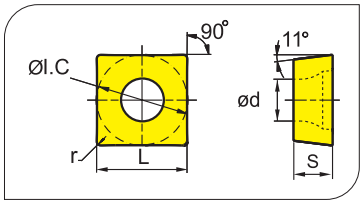
Tool holder / Klemmhalter

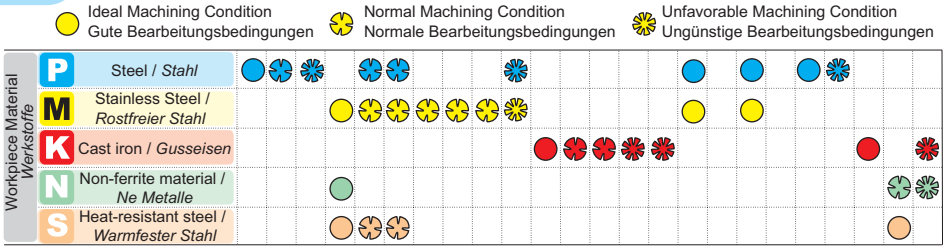
SSBCR/L Kr:75° 	**SSDCN** Kr:45° 	**SSKCR/L** Kr:75° 	**SSSCR/L** Kr:45° 	**SSKCR/L** Kr:75° 
Page/Seite A195	A195	A196	A196	A229

Insert code key ISO Code A42-A43
Grade selection reference Sortenauswahl A14/A31-A40
chip breaker selection reference Spanbrecherauswahl A24-A30
Recommended cutting parameters Empfohlene Schnittparameter A249-A253

A

SP** Positive Insert/ Positive WSP



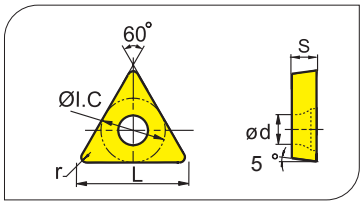


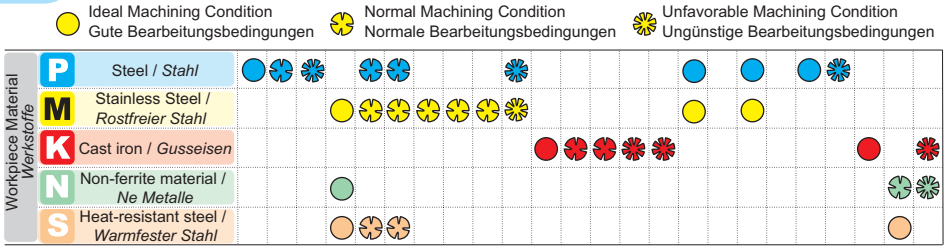
Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall												Cermet unbeschichtet	Cermet Coated beschicht. Cerm.	Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151	YNG151C	YC10	YC40	YD051	YD101	YD201
Flat	**SPMW09T304**	9.525	9.525	3.97	4.4	0.4																					
	SPMW09T308	9.525	9.525	3.97	4.4	0.8																					
	SPMW120408	12.7	12.7	4.76	5.56	0.8													○								

● Ex Stock / ab Lager ○ On demand / auf Anfrage

A

TB** Positive Insert/ Positive WSP

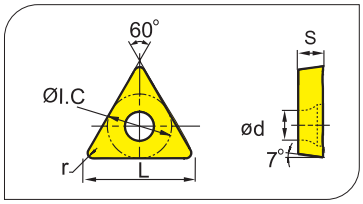


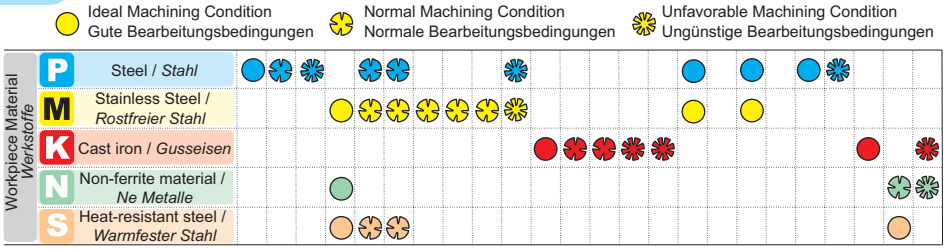


Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall												Cermet unbeschichtet		Cermet Coated beschicht. Cerm.	Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151		YNG151C	YC10	YC40	YD051	YD101	YD201
	**TBGH060102L**	6.4	3.97	1.98	2.2	0.2				○												○							
	TBGH060104L	6.4	3.97	1.98	2.2	0.4				○												○							

Insert code key ISO Code A42-A43
Grade selection reference Sortenauswahl A14/A31-A40
chip breaker selection reference Spanbrecherauswahl A24-A30
Recommended cutting parameters Empfohlene Schnittparameter A249-A253

TC** Positive Insert/ Positive WSP





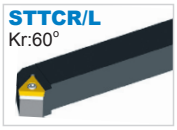
Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall												Cermet unbeschichtet	Cermet Coated beschicht. Cerm.	Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151	YNG151C	YC10	YC40	YD051	YD101	YD201
SF  Finishing Schlichten	TCGT06T102-SF	6.4	3.97	1.98	2.2	0.2															○	●					
	TCGT06T104-SF	6.4	3.97	1.98	2.2	0.4																					
	TCGT090202-SF	9.6	5.56	2.38	2.5	0.2															●	●					
	TCGT090204-SF	9.6	5.56	2.38	2.5	0.4															●	●					
	TCGT090208-SF	9.6	5.56	2.38	2.5	0.8																●					
	TCGT110302-SF	11	6.35	3.18	2.8	0.2																●					
	TCGT110304-SF	11	6.35	3.18	2.8	0.4															●	●					
	TCGT110308-SF	11	6.35	3.18	2.8	0.8																●					

Tool holder / Klemmhalter


STACR/L
Kr:90°


STFCR/L
Kr:90°


STGCR/L
Kr:90°


STTCR/L
Kr:60°

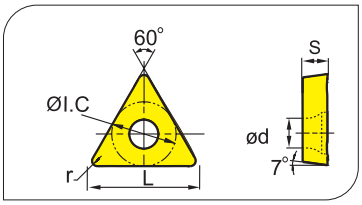

STFCR/L
Kr:90°

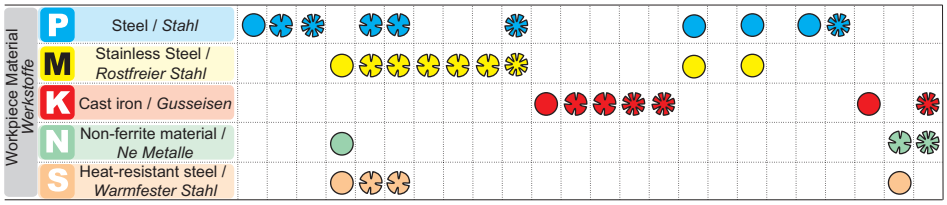
Page/Seite	A197	A197	A198	A199	A230

● Ex Stock / ab Lager ○ On demand / auf Anfrage

TC** Positive Insert/ Positive WSP

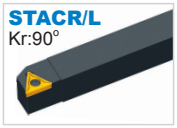
Ideal Machining Condition / Gute Bearbeitungsbedingungen
Normal Machining Condition / Normale Bearbeitungsbedingungen
Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen





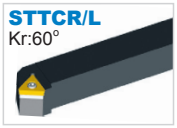
Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall												Cermet unbeschichtet	Cermet Coated beschicht. Cerm.	Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151	YNG151C	YC10	YC40	YD051	YD101	YD201
HF  Finishing Schlichten	**TCMT06T104-HF**	6.4	3.97	1.98	2.2	0.4																					
	TCMT06T108-HF	6.4	3.97	1.98	2.2	0.8																					
	TCMT090202-HF	9.6	5.56	2.38	2.5	0.2		●														●						
	TCMT090204-HF	9.6	5.56	2.38	2.5	0.4	●							●								●						
	TCMT090208-HF	9.6	5.56	2.38	2.5	0.8	○	●														●						
	TCMT110202-HF	11	6.35	2.38	2.8	0.2		●			●																	
	TCMT110204-HF	11	6.35	2.38	2.8	0.4	●	●	○										●			●	●					
	TCMT110208-HF	11	6.35	2.38	2.8	0.8	●		○					●				●				●						
	TCMT16T302-HF	16.5	9.525	3.97	4.4	0.2																					
	TCMT16T304-HF	16.5	9.525	3.97	4.4	0.4	●	●			●		○									●						
	TCMT16T308-HF	16.5	9.525	3.97	4.4	0.8	●	●														●						

Tool holder / Klemmhalter


STACR/L Kr:90°


STFCR/L Kr:90°


STGCR/L Kr:90°


STTCR/L Kr:60°


STFCR/L Kr:90°

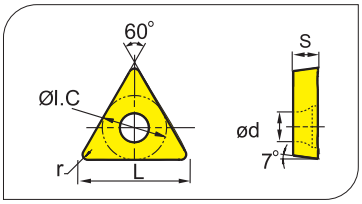
Page/Seite A197 A197 A198 A199 A230

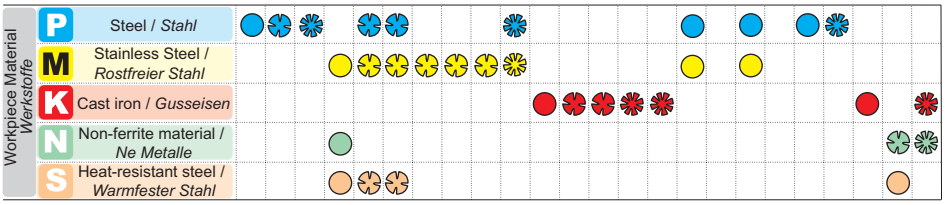
Insert code key ISO Code A42-A43
Grade selection reference Sortenauswahl A14/A31-A40
chip breaker selection reference Spanbrecherauswahl A24-A30
Recommended cutting parameters Empfohlene Schnittparameter A249-A253

A

TC** Positive Insert/ Positive WSP

Ideal Machining Condition / Gute Bearbeitungsbedingungen
Normal Machining Condition / Normale Bearbeitungsbedingungen
Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen





Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall												Cermet unbeschichtet		Cermet Coated beschicht. Cerm.	Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151		YNG151C	YC10	YC40	YD051	YD101	YD201
EF	**TCMT090202-EF**	9.6	5.56	2.38	2.5	0.2						○																
	TCMT090204-EF	9.6	5.56	2.38	2.5	0.4						○																
	TCMT110202-EF	11	6.35	2.38	2.8	0.2						○																
	TCMT110204-EF	11	6.35	2.38	2.8	0.4						●																
	TCMT110208-EF	11	6.35	2.38	2.8	0.8						●																
Finishing Schlichten	**TCMT16T304-EF**	16.5	9.525	3.97	4.4	0.4						●																
	TCMT16T308-EF	16.5	9.525	3.97	4.4	0.8						●																
EM	**TCMT090204-EM**	9.6	5.56	2.38	2.8	0.4						○																
	TCMT090208-EM	9.6	5.56	2.38	2.8	0.8						○																
	TCMT110204-EM	11	6.35	2.38	2.8	0.4						○																
	TCMT110208-EM	11	6.35	2.38	2.8	0.8						○																
	TCMT110212-EM	11	6.35	2.38	2.8	1.2																						
Medium Cut/ Mittl. Bearb.	**TCMT16T304-EM**	16.5	9.525	3.97	4.4	0.4						●																
	TCMT16T308-EM	16.5	9.525	3.97	4.4	0.8						●																
	TCMT16T312-EM	16.5	9.525	3.97	4.4	1.2						○																

Tool holder / Klemmhalter


STACR/L Kr:90°


STFCR/L Kr:90°


STGCR/L Kr:90°


STTCR/L Kr:60°

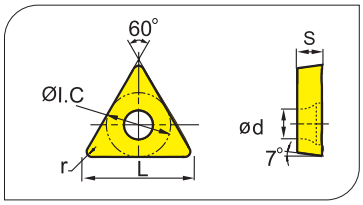

STFCR/L Kr:90°

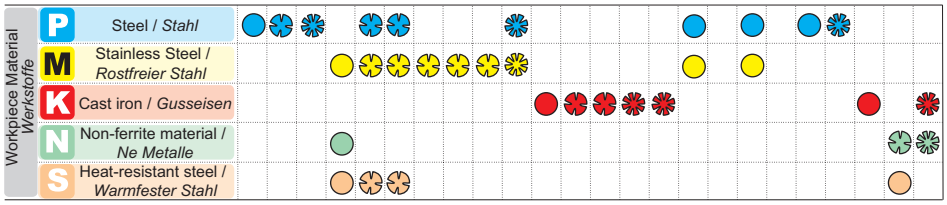
Page/Seite A197 A197 A198 A199 A230

● Ex Stock / ab Lager ○ On demand / auf Anfrage

TC** Positive Insert/ Positive WSP

Ideal Machining Condition / Gute Bearbeitungsbedingungen
Normal Machining Condition / Normale Bearbeitungsbedingungen
Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen





Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall												Cermet unbeschichtet	Cermet Coated beschicht. Cerm.	Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151	YNG151C	YC10	YC40	YD051	YD101	YD201
HM	TCMT090204-HM	9.6	5.56	2.38	2.5	0.4	○	●	○											●							○
	TCMT090208-HM	9.6	5.56	2.38	2.5	0.8	○	●	○											●							
	TCMT110204-HM	11	6.35	2.38	2.8	0.4	●	●	●		●				●			●		●							
	TCMT110208-HM	11	6.35	2.38	2.8	0.8		●										●	○								
	TCMT16T304-HM	16.5	9.525	3.97	4.4	0.4	●	●	●		●				●			●									
	TCMT16T308-HM	16.5	9.525	3.97	4.4	0.8	●	●	●		●			●	●			●		●	○						○
	TCMT16T312-HM	16.5	9.525	3.97	4.4	1.2		●	●						○												
HR	TCMT090204-HR	9.6	5.56	2.38	2.5	0.4		○																			
	TCMT090208-HR	9.6	5.56	2.38	2.5	0.8		○																			
	TCMT110204-HR	11	6.35	2.38	2.8	0.4		○																			
	TCMT110208-HR	11	6.35	2.38	2.8	0.8		●																			
	TCMT16T304-HR	16.5	9.525	3.97	4.4	0.4		●																			
	TCMT16T308-HR	16.5	9.525	3.97	4.4	0.8	●	●	●					●	○			●		●							
	TCMT16T312-HR	16.5	9.525	3.97	4.4	1.2	●	●	○									○									
	TCMT220408-HR	22	12.7	4.76	5.5	0.8		●	●																		
LH	TCGX090202-LH	9.6	5.56	2.38	2.5	0.2				●																●	
	TCGX090204-LH	9.6	5.56	2.38	2.5	0.4																				●	
	TCGX110202-LH	11	6.35	2.38	2.8	0.2				●																●	
	TCGX110204-LH	11	6.35	2.38	2.8	0.4				●																●	
	TCGX110208-LH	11	6.35	2.38	2.8	0.8																					
	TCGX16T302-LH	16.5	9.525	3.97	4.4	0.2				○																●	
	TCGX16T304-LH	16.5	9.525	3.97	4.4	0.4				●																●	
	TCGX16T308-LH	16.5	9.525	3.97	4.4	0.8				●																●	

Medium Cut/ Mittl. Bearb.

Roughing/ Schruppen

Aluminium Machining/ Aluminium-bearbeitung

Tool holder / Klemmhalter











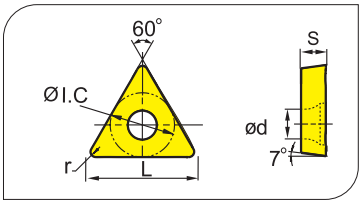
Page/Seite A197 A197 A198 A199 A230

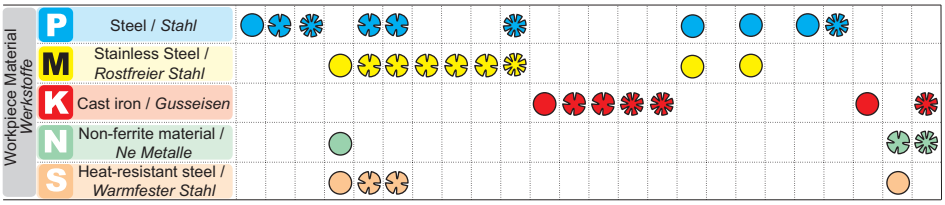
Insert code key ISO Code A42-A43
Grade selection reference Sortenauswahl A14/A31-A40
chip breaker selection reference Spanbrecherauswahl A24-A30
Recommended cutting parameters Empfohlene Schnittparameter A249-A253

A

TC** Positive Insert/ Positive WSP

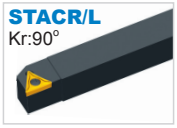
Ideal Machining Condition / Gute Bearbeitungsbedingungen
Normal Machining Condition / Normale Bearbeitungsbedingungen
Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen





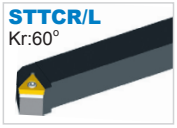
Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall												Cermet unbeschichtet		Cermet Coated beschicht. Cerm.		Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151		YNG151C		YC10	YC40	YD051	YD101	YD201
Basic	**TCMT220408**	22	12.7	4.76	5.5	0.8		●										○											
Flat	**TCMW110204**	11	6.35	2.38	2.8	0.4	○												○										
	TCMW16T304	16.5	9.525	3.97	4.4	0.4	○												○			○							
	TCMW16T308	16.5	9.525	3.97	4.4	0.8	○												○			●							
	TCMW16T312	16.5	9.525	3.97	4.4	1.2	○												○										
	TCMW220408	22	12.7	4.76	5.5	0.8													○									○	

Tool holder / Klemmhalter


STACR/L Kr:90°


STFCR/L Kr:90°


STGCR/L Kr:90°


STTCR/L Kr:60°

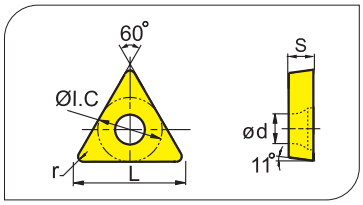

STFCR/L Kr:90°

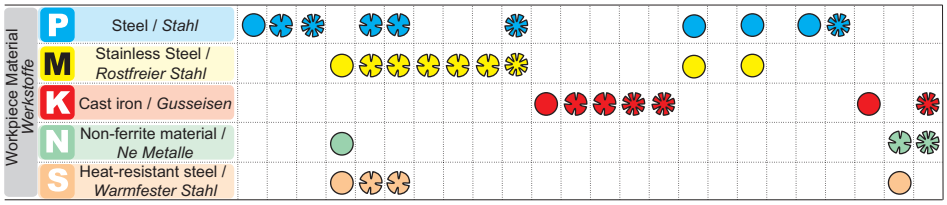
Page/Seite	A197	A197	A198	A199	A230

● Ex Stock / ab Lager ○ On demand / auf Anfrage

TP** Positive Insert/ Positive WSP

Ideal Machining Condition / Gute Bearbeitungsbedingungen
Normal Machining Condition / Normale Bearbeitungsbedingungen
Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen





Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall												Cermet unbeschichtet	Cermet Coated beschicht.Cerm.	Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151	YNG151C	YC10	YC40	YD051	YD101	YD201
SF  Finishing Schlichten	**TPGT090202-SF**	9.6	5.56	2.38	2.5	0.2																○	●					
	TPGT090204-SF	9.6	5.56	2.38	2.5	0.4																●	●					
	TPGT090208-SF	9.6	5.56	2.38	2.5	0.8																○	●					
	TPGT110302-SF	11	6.35	3.18	2.8	0.2																●	●					
	TPGT110304-SF	11	6.35	3.18	2.8	0.4																●	●					
	TPGT110308-SF	11	6.35	3.18	2.8	0.8																○	●					
 Super Finishing Super Schlichten	**TPGH090202L**	9.6	5.56	2.38	2.5	0.2				○												○						
	TPGH090204L	9.6	5.56	2.38	2.5	0.4				○												○						
	TPGH110302L	11	6.35	3.18	2.8	0.2				○												○						
	TPGH110304L	11	6.35	3.18	2.8	0.4				○												○						

Tool holder / Klemmhalter

STUPR/L
Kr:93°

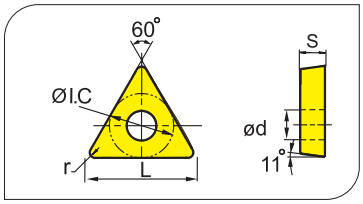


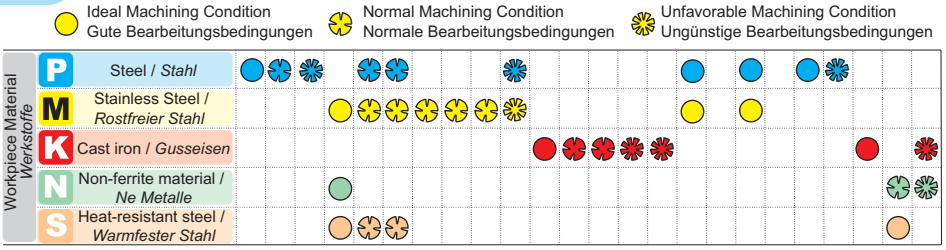
Page/Seite A238

Insert code key ISO Code A42-A43
Grade selection reference Sortenauswahl A14/A31-A40
chip breaker selection reference Spanbrecherauswahl A24-A30
Recommended cutting parameters Empfohlene Schnittparameter A249-A253

A

TP** Positive Insert/ Positive WSP

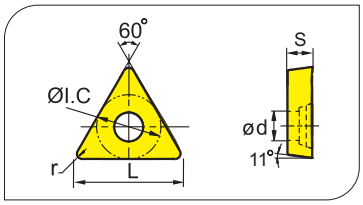




Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall												Cermet	Coated Beschicht.	Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151	YNG151C	YC10	YC40	YD051	YD101	YD201
Flat	**TPGA090204**	9.6	5.56	2.38	2.5	0.4																					
	TPGA090208	9.6	5.56	2.38	2.5	0.8																					
	TPGA110204	11	6.35	2.38	2.8	0.4																					
	TPGA110212	11	6.35	2.38	2.8	1.2																					
	TPGA160304	16.5	9.525	3.18	4.4	0.4																					
	TPGA160308	16.5	9.525	3.18	4.4	0.8																					

● Ex Stock / ab Lager ○ On demand / auf Anfrage

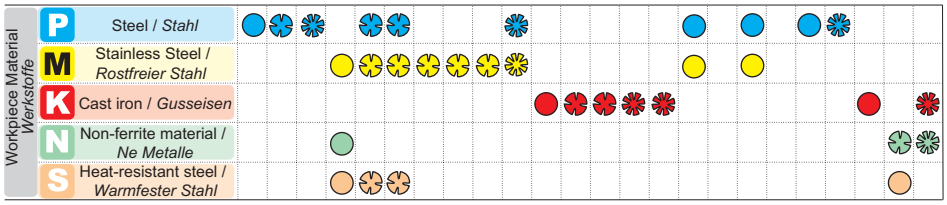
TP** Positive Insert/ Positive WSP



Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen

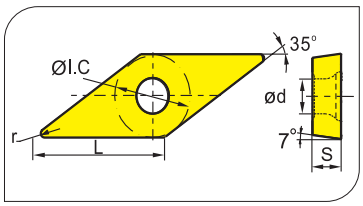


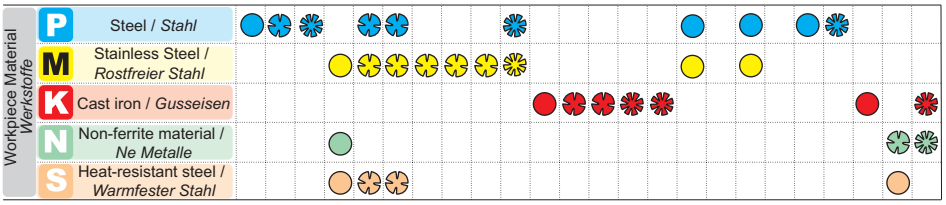
Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall												Cermet unbeschichtet		Cermet Coated beschicht. Cerm.	Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151		YNG151C	YC10	YC40	YD051	YD101	YD201
Flat	**TPGB090204**	9.6	5.56	2.38	2.5	0.4																						
	TPGB090208	9.6	5.56	2.38	2.5	0.8																						
	TPGB270416	27.5	15.875	4.76	5.16	1.6																						
Flat	**TPGW090204**	9.6	5.56	2.38	2.5	0.4																						
	TPGW090208	9.6	5.56	2.38	2.5	0.8																						
	TPGW110304	11	6.35	3.18	2.8	0.4																					○	
	TPGW110308	11	6.35	3.18	2.9	0.8																						
	TPGW160308	16.5	9.525	3.18	4.4	0.8																					○	○
	TPGW16T302	16.5	9.525	3.97	4.4	0.2																						
	TPGW220408	22	12.7	4.76	5.5	0.8																						

Insert code key ISO Code A42-A43
Grade selection reference Sortenauswahl A14/A31-A40
chip breaker selection reference Spanbrecherauswahl A24-A30
Recommended cutting parameters Empfohlene Schnittparameter A249-A253

VC** Positive Insert/ Positive WSP

Ideal Machining Condition / Gute Bearbeitungsbedingungen
Normal Machining Condition / Normale Bearbeitungsbedingungen
Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen





Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall												Cermet unbeschichtet		Cermet Coated beschicht. Cerm.		Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151		YNG151C		YC10	YC40	YD051	YD101	YD201
SF Finishing Schlichten	VCGT110302-SF	11	6.35	3.18	2.8	0.2																●		●						
	VCGT110304-SF	11	6.35	3.18	2.8	0.4																●		●						
	VCGT160404-SF	16.5	9.525	4.8	4.4	0.4																		○						
HF Finishing Schlichten	VCGT110304-HF	11	6.35	3.18	2.8	0.4		●																						
	VCGT130304	13.8	7.94	3.3	3.4	0.4		●																						
NF Finishing Schlichten	VCGT160408-NF	16.5	9.525	4.76	4.4	0.8				●																				

Tool holder / Klemmhalter





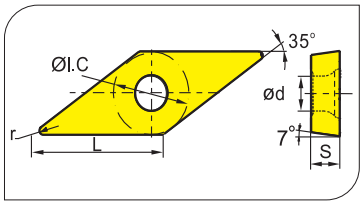




Page/Seite A231 A232 A193 A194

● Ex Stock / ab Lager ○ On demand / auf Anfrage

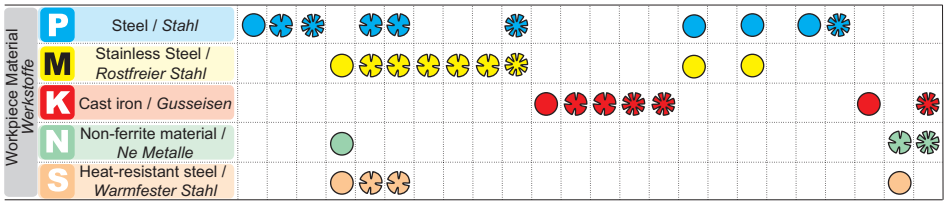
VC** Positive Insert/ Positive WSP



Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen



Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall												Cermet unbeschichtet		Cermet Coated beschicht. Cerm.		Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151		YNG151C		YC10	YC40	YD051	YD101	YD201
LH	**VCGX110202-LH**	11	6.35	2.38	2.8	0.2																							
	VCGX110204-LH	11	6.35	2.38	2.8	0.4				●																		●	
	VCGX110301-LH	11	6.35	3.18	2.8	0.1				○																			○
	VCGX110302-LH	11	6.35	3.18	2.8	0.2				●	●																	●	
	VCGX110304-LH	11	6.35	3.18	2.8	0.4				●	●																	●	
	VCGX110308-LH	11	6.35	3.18	2.8	0.8																							
Aluminium Machining/ Aluminium-bearbeitung	**VCGX160402-LH**	16.6	9.525	4.76	4.4	0.2				●	●																	●	
	VCGX160404-LH	16.6	9.525	4.76	4.4	0.4				●	●																	●	
	VCGX160408-LH	16.6	9.525	4.76	4.4	0.8				●	●																	●	
	VCGX160412-LH	16.6	9.525	4.76	4.4	1.2				○																		●	○
	VCGX220530-LH	22	12.7	5.56	5.5	3.0				○																		●	○

Tool holder / Klemmhalter







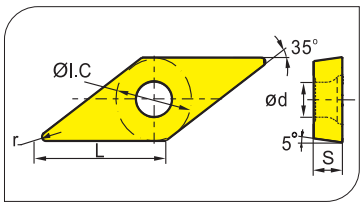


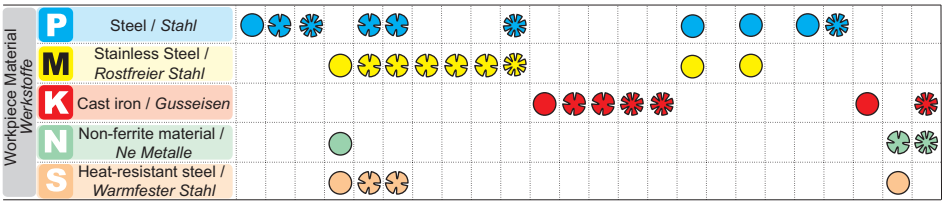
Page/Seite A231 A232 A193 A194

Insert code key ISO Code A42-A43
Grade selection reference Sortenauswahl A14/A31-A40
chip breaker selection reference Spanbrecherauswahl A24-A30
Recommended cutting parameters Empfohlene Schnittparameter A249-A253

VB** Positive Insert/ Positive WSP

Ideal Machining Condition / Gute Bearbeitungsbedingungen
Normal Machining Condition / Normale Bearbeitungsbedingungen
Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen



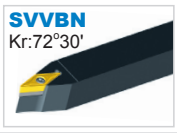


Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall														Cermet unbeschichtet	Cermet Coated beschicht. Cerm.	Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151	YNG151C	YC10	YC40	YD051	YD101	YD201
SF	VBGT110302-SF	11	6.35	3.18	2.8	0.2																●					
	VBGT110304-SF	11	6.35	3.18	2.8	0.4																●					
Finishing Schlichten																											
EF	VBMT110302-EF	11	6.35	3.18	2.8	0.2						●															
	VBMT110304-EF	11	6.35	3.18	2.8	0.4						●															
	VBMT110308-EF	11	6.35	3.18	2.8	0.8						○															
	VBMT160404-EF	16.5	9.525	4.76	4.4	0.4						●															
	VBMT160408-EF	16.5	9.525	4.76	4.4	0.8						●															
Finishing Schlichten																											
53	VBMT160404-53	16.6	9.525	4.76	4.4	0.4	●	●	○		●											●	○				
	VBMT160408-53	16.6	9.525	4.76	4.4	0.4	●	●	○		●											●	○				
Finishing Schlichten																											
HF	VBMT110202-HF	11	6.35	2.38	2.8	0.2		●	○		●																
	VBMT110204-HF	11	6.35	2.38	2.8	0.4		●			●			●								●					
	VBMT110208-HF	11	6.35	2.38	2.8	0.8	●	●			●												○				
Finishing Schlichten																											
NF	VBET160404-NF	16.5	9.525	4.76	4.4	0.4				●																	
	VBET160408-NF	16.5	9.525	4.76	4.4	0.8				●																	
Finishing Schlichten																											

Tool holder / Klemmhalter


SVJBR/L
Kr:93°


SVABR/L
Kr:90°


SVVBN
Kr:72°30'


SVQBR/L
Kr:107°30'


SVUBR/L
Kr:93°

Page/Seite A190 A191 A192 A233 A234

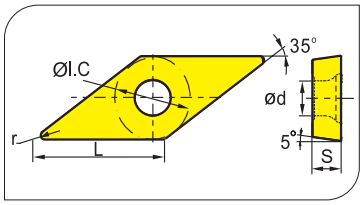
● Ex Stock / ab Lager ○ On demand / auf Anfrage

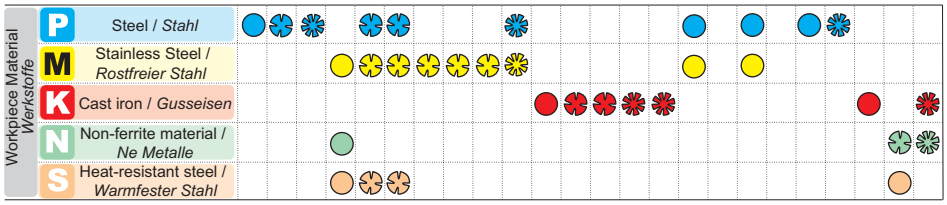
VB** Positive Insert/ Positive WSP

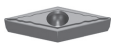
Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen

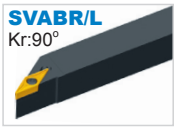


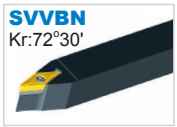


Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall												Cermet unbeschichtet		Cermet Coated beschicht. Cerm.		Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151		YNG151C		YC10	YC40	YD051	YD101	YD201
EM  Medium Cut/ Mittl. Bearb.	**VBMT110304-EM**	11	6.35	3.18	2.8	0.4						●																
	VBMT110308-EM	11	6.35	3.18	2.8	0.8						●																
HM  Medium Cut/ Mittl. Bearb.	**VBMT160404-HM**	16.5	9.525	4.76	4.4	0.4	●	●	○	●	●			●	●			●										○
	VBMT160408-HM	16.5	9.525	4.76	4.4	0.8	●	●	●		●			●	●			●		○								○
	VBMT160412-HM	16.5	9.525	4.76	4.4	1.2	●	●	○																			
HR  Roughing / Schruppen	**VBMT160404-HR**	16.5	9.525	4.76	4.4	0.4																						
	VBMT160408-HR	16.5	9.525	4.76	4.4	0.8	○	●	○					○	●													
	VBMT160412-HR	16.5	9.525	4.76	4.4	1.2											○											
	VBGT160408-HR	16.5	9.525	4.76	4.4	0.8		○																				
Flat 	**VBMW160404**	16.5	9.525	4.76	4.4	0.4	○												○									●
	VBMW160408	16.5	9.525	4.76	4.4	0.8																						

Tool holder / Klemmhalter


SVJBR/L
Kr:93°
Page/Seite A190


SVABR/L
Kr:90°
A191


SVVBN
Kr:72°30'
A192

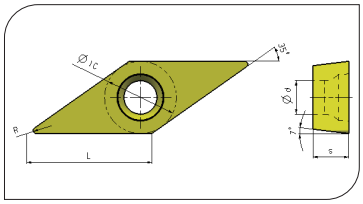

SVQBR/L
Kr:107°30'
A233


SVUBR/L
Kr:93°
A234

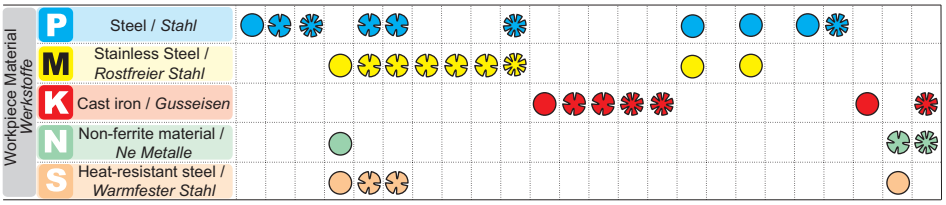
Insert code key ISO Code A42-A43
Grade selection reference Sortenauswahl A14/A31-A40
chip breaker selection reference Spanbrecherauswahl A24-A30
Recommended cutting parameters Empfohlene Schnittparameter A249-A253

A

VC** Positive Insert/ Positive WSP



Ideal Machining Condition / Gute Bearbeitungsbedingungen
Normal Machining Condition / Normale Bearbeitungsbedingungen
Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen



Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichtetes Hartmetall												Cermet unbeschichtet		Cermet Coated beschicht. Cerm.		Uncoated Carbide unbeschicht. Hartmetall				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151		YNG151C		YC10	YC40	YD051	YD101	YD201
EM	VCMT160404-EM	16	9.525	4.76	4.4	0.4						●																	
	VCMT160408-EM	16	9.525	4.76	4.4	0.8						●																	
Finishing Schlichten																													

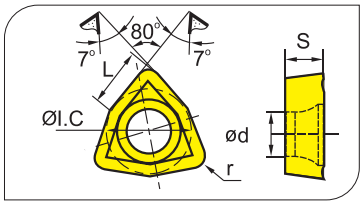
● Ex Stock / ab Lager ○ On demand / auf Anfrage

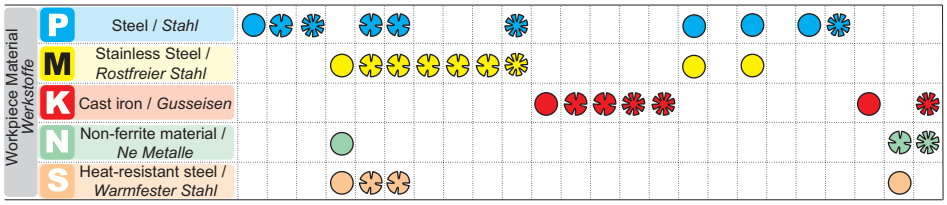
WC** Positive Insert/ Positive WSP

Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen





insert shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Coated Carbide Beschichte Hartmetal												Cermet unbeschichtet	Cermet Coated beschicht. Cerm.	carbide Hartmetal				
		L	I.C	S	d	r	YBC151	YBC251	YBC351	YBG102	YBG202	YBG205	YBG302	YBM151	YBM251	YBM351	YBD052	YBD102	YBD151	YBD152	YBD252	YNG151	YNG151C	YC10	YC40	YD051	YD101	YD201
Basic 	**WCMX040208R-53**	4.3	6.35	2.38	3.1	0.8																					
	WCMX06T308R-53	6.5	9.525	3.97	3.7	0.8																					
	WCMX080412R-53	8.7	12.7	4.76	4.3	1.2																					

Tool holder / Klemmhalter

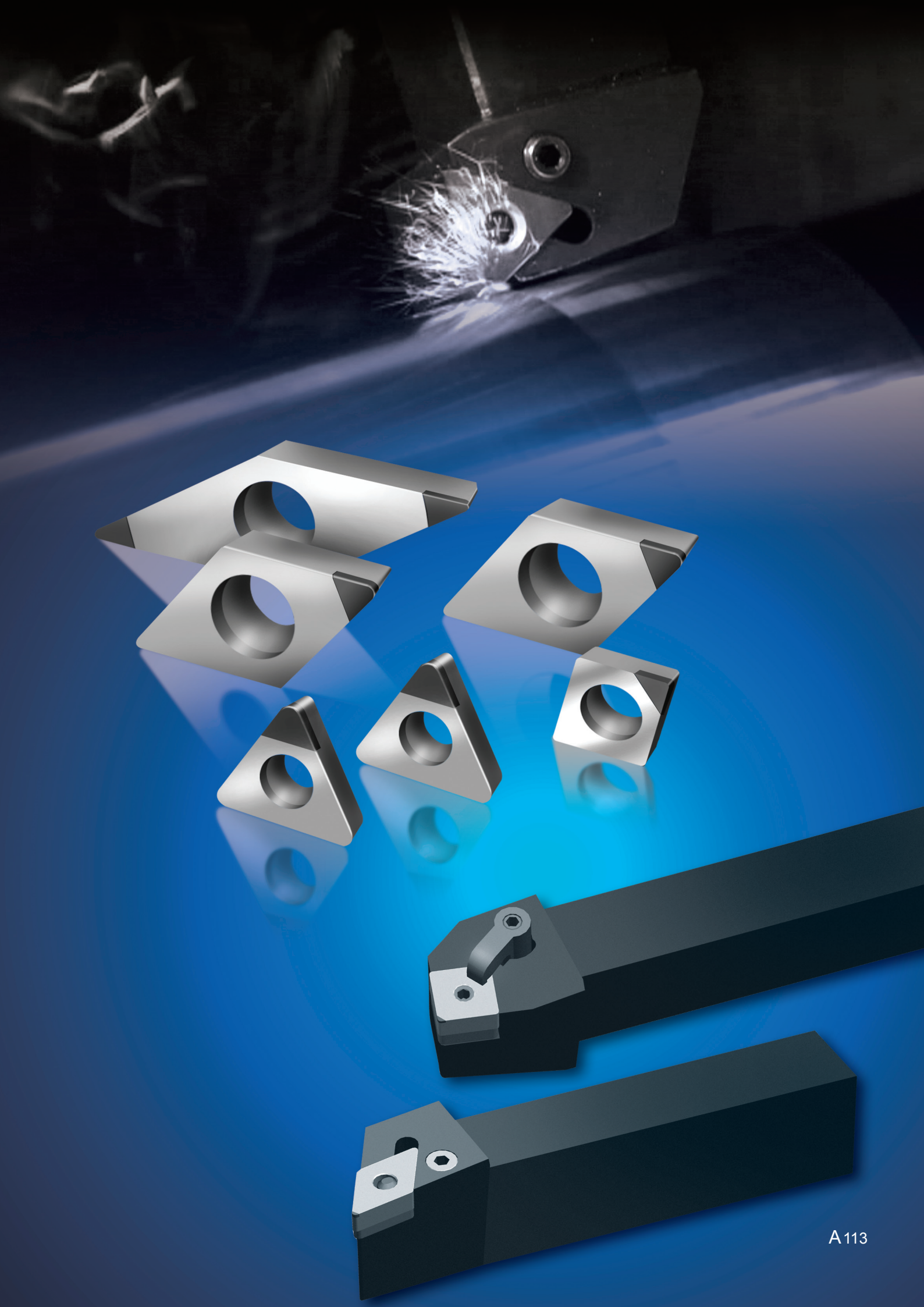
SWACR/L
Kr:90°



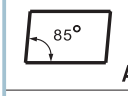
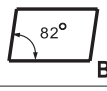
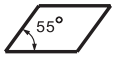
Page/Seite A200

Insert code key ISO Code A42-A43
Grade selection reference Sortenauswahl A14/A31-A40
chip breaker selection reference Spanbrecherauswahl A24-A30
Recommended cutting parameters Empfohlene Schnittparameter A249-A253

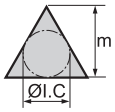
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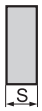


Insert shape / Schneidplattenform

 A	 B	 C
 D	 E	 H
 K	 L	 M
 P	 S	 T
 V	 W	Others Z

Tolerance / Toleranzklasse

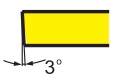
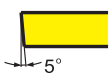
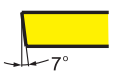
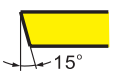
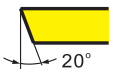
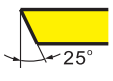
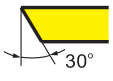
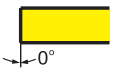
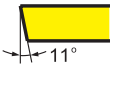




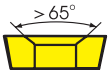
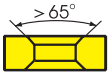
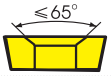
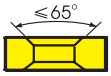
Code	Tolerance Toleranzklasse	Tolerance ØI.C	Thickness S Dicke	Code	Tolerance	Tolerance ØI.C	Thickness S Dicke
A	±0.005	±0.025	±0.025	J	±0.005	±0.05-±0.13	±0.025
F	±0.005	±0.013	±0.025	K	±0.013	±0.05-±0.13	±0.025
C	±0.013	±0.025	±0.025	L	±0.025	±0.05-±0.13	±0.025
H	±0.013	±0.013	±0.025	M	±0.08-±0.18	±0.05-±0.13	±0.13
E	±0.025	±0.025	±0.025	N	±0.08-±0.18	±0.05-±0.13	±0.025
G	±0.025	±0.025	±0.13	U	±0.13-±0.38	±0.08-±0.25	±0.13

C N G A

Clearance angle of main cutting edge
Freiwinkel der Hauptschneide

Code	Angle / *Winkel*	Code	Angle / *Winkel*
A	 3°	B	 5°
C	 7°	D	 15°
E	 20°	F	 25°
G	 30°	N	 0°
P	 11°	O	Others

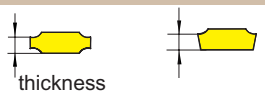
Insert type / *Plattentyp*

Code	Hole	Insert Section
N	----	
B	✔	
C	✔	
A	✔	
W	✔	
Q	✔	
X	----	Special

Cutting edge length / *Schneidenlänge (mm)*

ØI.C (mm)	Insert Shape/ Plattenform C	D	S	T	V	W
3.97				06		
5.0						
5.56				09		
6.0						
6.35	06	07		11	11	
8.0						
9.525	09	11	09	16	16	06
10.0						
12.0						
12.7	12	15	12	22	22	08
15.875	16		15	27		
16.0		19				
19.05	19		19	33		
20.0						
25.0	25	25				
25.4			25			
31.75						
32						

Insert thickness / *Dicke* (mm)



Code	Insert Thickness / Dicke	Code	Insert Thickness / Dicke
02	2.38	06	6.35
T2	2.58	T6	6.75
03	3.18	07	7.94
T3	3.97	09	9.52
04	4.76	T9	9.72
T4	4.96	11	11.11
05	5.56	12	12.70
T5	5.95		

Nose radius *Eckenradius*

Code	Radius (mm)
00	–
02	0.2
04	0.4
08	0.8
12	1.2
16	1.6
20	2.0
24	2.4
32	3.2
X	Others Andere
Mo	Round Insert Runde Platten

12 04 08 T 3 1 -2 W

Profile of cutting edges *Schneidkantenausführung*

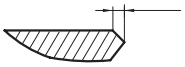
Code	Cutting Edge Schneidkante	Shape Form Plattenform
F	Sharp edges *Scharfe Kante*	
E	Honing *Verrundung*	
T	Chamfering *Fase*	
S	Chamfering *Fase* + Honing *Verrundung*	

Angle of Chamfer *Winkel der Fase*



0	5°
1	10°
2	15°
3	20°
4	25°
5	30°

Width of Chamfer *Breite der Fase*



0	0.1
1	0.15
2	0.2
3	0.25
4	0.3
5	0.35
6	0.4
7	0.45

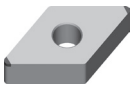
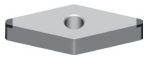
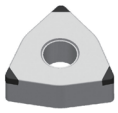
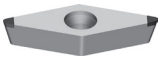
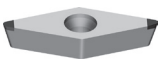
Number of cutting edges *Anzahl der Schneidkanten*

Code	Number of edges *Anzahl der Schneidkanten*	
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2	2	
3	3	
4	4	

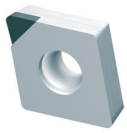
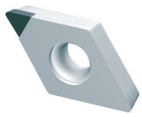
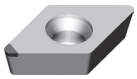
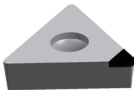
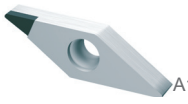
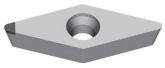
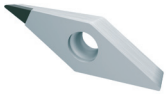
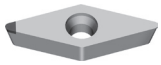
Wiper edge Wiperfase

W

PCBN

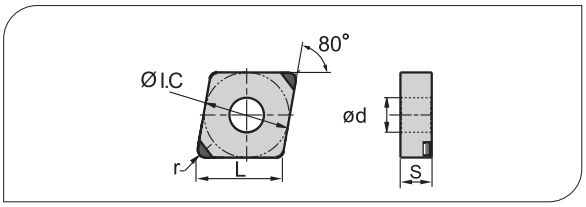
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Negative Inserts · WSP	 A118	CNGA120404-2	●	●	●	○
		CNGA120408-2	●	●	●	●
		CNGA120412-2	●	●	●	●
		CNGA120408-2W	●	●		
		CNGA120412-2W	●	●		
	 A119	DNGA150604-2	●	●		○
		DNGA150608-2	●	●	○	●
		DNGA150612-2	●	●	○	○
	 A120	SNGA120408-2	○	●	●	○
		SNGA120412-2	○	●	●	○
	 A121	TNGA160404-3	●	●		
		TNGA160408-3	●	●	●	●
		TNGA160412-3	●	●	●	●
	 A122	VNGA160404-2	●	○		
		VNGA160408-2	●	○		
	 A122	WNGA160404-3		●		
		WNGA160408-3		●		
Positive Inserts · WSP	 A123	CCGW060204-1	●	●		
		CCGW060208-1	●	●		
		CCGW09T304-2	●	●	○	●
		CCGW09T308-2	●	●	○	●
		CCGW120404-2	○	●	○	●
		CCGW120408-2	○	●	○	●
	 A124	DCGW070202-1	○	○		
		DCGW070204-1	●	●		
		DCGW070208-1	●	●		
		DCGW11T304-2	●	●	○	●
		DCGW11T308-2	●	●	○	●
	 A125	TCGW110204-1	●	●	○	
		TCGW110208-1	●	●	○	
		TCGW16T304-3	●	●	○	○
		TCGW16T308-3	●	●	○	○
	 A126	VBGW160404-2	●	●		●
		VBGW160408-2	●	●		●
	 A126	VCGW160404-2	●	●		●
		VCGW160408-2	●	●		●

PCD

Insert Shape *Schneidplattenform*	Type · *Typ*	Grade · *Sorte*
		YCD421
 A127	**CCMT060202**	●
	CCMT060204	●
	CCMT09T304	●
	CCMT09T308	●
	CCMT120404	●
	CCMT120408	●
 A128	**CCMW060202**	●
	CCMW060204	●
	CCMW09T304	●
	CCMW09T308	●
	CCMW120404	●
	CCMW120408	●
 A129	**DCMT070202**	●
	DCMT070204	●
	DCMT11T302	●
	DCMT11T304	●
	DCMT11T308	●
 A130	**DCMW070202**	●
	DCMW070204	●
	DCMW070208	●
	DCMW11T302	●
	DCMW11T304	●
	DCMW11T308	●
 A131	**TCMT110204**	●
	TCMT16T304	●
	TCMT16T308	●
 A132	**TCMW110208**	●
	TCMW160304	●
	TCMW160308	●
 A133	**VBMT160404**	●
	VBMT160408	●
 A133	**VBMW160404**	●
	VBMW160408	●
 A134	**VCMT160404**	●
	VCMT160408	●
 A134	**VCMW160404**	●
	VCMW160408	●

A

CN**



Continuous cutting
Vollschnitt

Continuous and interrupted cutting
Voll- und leicht unterbrochener Schnitt

Interrupted cutting
Stark unterbrochener Schnitt

Workpiece Material
Werkstoffe

H	Hardened material / *Gehärtete Werkstoff*	●	◔	✱
K	Cast iron / *Gusseisen*			●
N	Non-ferrite material / *Ne Metalle*			

Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					CBN					
		L	I.C	S	d	r	YCB111	YCB121	YCB131	YCB211		
	**CNGA120404-2**	12.9	12.7	4.76	5.16	0.4	●	●	●	○		
	CNGA120408-2	12.9	12.7	4.76	5.16	0.8	●	●	●	●		
	CNGA120412-2	12.9	12.7	4.76	5.16	1.2	●	●	●	●		
	CNGA120408-2W	12.9	12.7	4.76	5.16	0.8	●	●				
	CNGA120412-2W	12.9	12.7	4.76	5.16	1.2	●	●				

Tool Holder · Klemmhalter



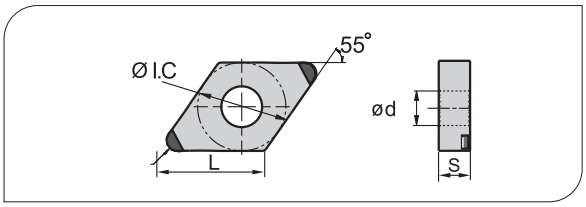




Page ·Seite A159 A171 A216

● Ex Stock / ab Lager ○ On demand / auf Anfrage

DN**



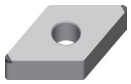
Continuous cutting
Vollschnitt

Continuous and interrupted cutting
Voll- und leicht unterbrochener Schnitt

Interrupted cutting
Stark unterbrochener Schnitt

Workpiece Material
Werkstoffe

H	Hardened material / *Gehärtete Werkstoff*	●	◔	✱
K	Cast iron / *Gusseisen*			●
N	Non-ferrite material / *Ne Metalle*			

Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					CBN					
		L	I.C	S	d	r	YCB111	YCB121	YCB131	YCB211		
	**DNGA150604-2**	15.5	12.7	6.35	5.16	0.4	●	●	●	○		
	DNGA150608-2	15.5	12.7	6.35	5.16	0.8	●	●	○	●		
	DNGA150612-2	15.5	12.7	6.35	5.16	1.2	●	●	○	○		

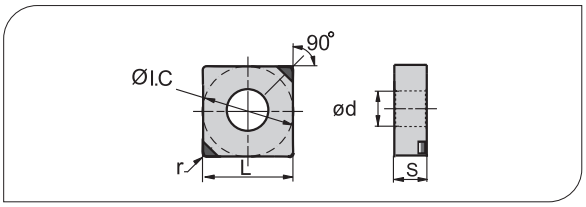
Tool Holder · Klemmhalter

PDJNR/L Kr:93°	**PDNNR/L** Kr:63°	**MDJNR/L** Kr:93°	**MDPNN** Kr:62°30'	**PDSNR/L** Kr:62°30'	**PDUNR/L** Kr:93°
					
Page · Seite A160	A161	A172	A173	A218	A219

● Ex Stock / ab Lager ○ On demand / auf Anfrage

A

SN**



Continuous cutting
Vollschnitt

Continuous and interrupted cutting
Voll- und leicht unterbrochener Schnitt

Interrupted cutting
Stark unterbrochener Schnitt

Workpiece Material / Werkstoffe				
H	Hardened material / *Gehärtete Werkstoff*	●	◉	✳
K	Cast iron / *Gusseisen*			●
N	Non-ferrite material / *Ne Metalle*			

Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					CBN					
		L	I.C	S	d	r	YCB111	YCB121	YCB131	YCB211		
	**SNGA120408-2**	12.7	12.7	4.76	5.16	0.8	○	●	○	○		
	SNGA120412-2	12.7	12.7	4.76	5.16	1.2	○	●	○	○		

Tool Holder · Klemmhalter


PSBNR/L Kr:75°
Page ·Seite A162


PSDNN Kr:45°
Page ·Seite A163


PSKNR/L Kr:75°
Page ·Seite A164


PSSNR/L Kr:45°
Page ·Seite A165


MSBNR/L Kr:75°
Page ·Seite A162


MSRNR/L Kr:75°
Page ·Seite A175

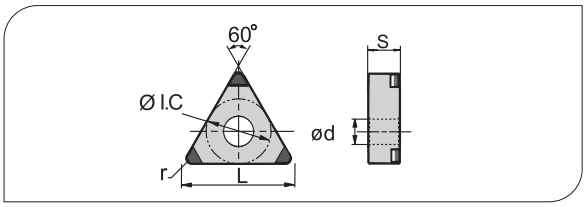

MSKNR/L Kr:75°
Page ·Seite A176


MSDNN Kr:45°
Page ·Seite A177


PSKNR/L Kr:75°
Page ·Seite A221

● Ex Stock / ab Lager ○ On demand / auf Anfrage

TN**



Continuous cutting
Vollschnitt

Continuous and interrupted cutting
Voll- und leicht unterbrochener Schnitt

Interrupted cutting
Stark unterbrochener Schnitt

Workpiece Material
Werkstoffe

H	Hardened material / *Gehärtete Werkstoff*	●	●	●
K	Cast iron / *Gusseisen*			●
N	Non-ferrite material / *Ne Metalle*			

Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					CBN					
		L	I.C	S	d	r	YCB111	YCB121	YCB131	YCB211		
	**TNGA160404-3**	16.5	9.525	4.76	3.81	0.4	●	●				
	TNGA160408-3	16.5	9.525	4.76	3.81	0.8	●	●	●	●		
	TNGA160412-3	16.5	9.525	4.76	3.81	1.2	●	●	●	●		

Tool Holder · Klemmhalter


PTFNR/L Kr:90°


PTTNR/L Kr:60°


PTGNR/L Kr:90°


MTGNR/L Kr:90°


MTJNR/L Kr:93°

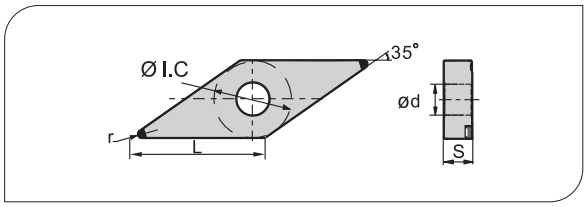

MTFNR/L Kr:90°


PTFNR/L Kr:90°

Page ·Seite A166 A167 A168 A178 A179 A180 A222

● Ex Stock / ab Lager ○ On demand / auf Anfrage

VN**



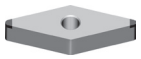
Continuous cutting
Vollschnitt

Continuous and interrupted cutting
Voll- und leicht unterbrochener Schnitt

Interrupted cutting
Stark unterbrochener Schnitt

Workpiece Material / Werkstoffe

H	Hardened material / *Gehärtete Werkstoff*	●	◐	◐					
K	Cast iron / *Gusseisen*				●				
N	Non-ferrite material / *Ne Metalle*								

Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					CBN					
		L	I.C	S	d	r	YCB111	YCB121	YCB131	YCB211		
	**VNGA160404-2**	16.6	9.525	4.76	3.81	0.4	●	○				
	VNGA160408-2	16.6	9.525	4.76	3.81	0.8	●	○				

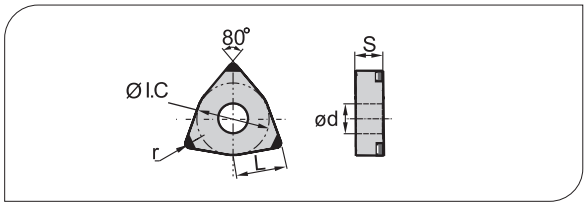
Tool Holder · Klemmhalter


MVVNN
Kr:72°30'


MVJNR/L
Kr:93°

Page ·Seite A181 A182

WN**



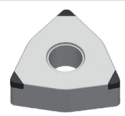
Continuous cutting
Vollschnitt

Continuous and interrupted cutting
Voll- und leicht unterbrochener Schnitt

Interrupted cutting
Stark unterbrochener Schnitt

Workpiece Material / Werkstoffe

H	Hardened material / *Gehärtete Werkstoff*	●	◐	◐					
K	Cast iron / *Gusseisen*				●				
N	Non-ferrite material / *Ne Metalle*								

Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					CBN					
		L	I.C	S	d	r	YCB111	YCB121	YCB131	YCB211		
	**WNGA080408-3**	8.69	12.7	4.76	5.16	0.8		●				
	WNGA160404-3	8.69	12.7	4.76	5.16	04		●				
	WNGA160408-3	8.69	12.7	4.76	5.16	0.8						

Tool Holder · Klemmhalter


PWLNR/L
Kr:95°

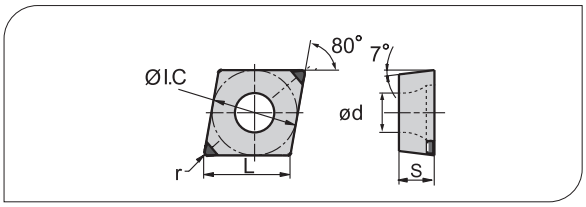

MWLNR/L
Kr:95°


PWLNR/L
Kr:95°

Page ·Seite A169 A183 A223

● Ex Stock / ab Lager ○ On demand / auf Anfrage

CC**



● Continuous cutting
Vollschnitt

◔ Continuous and interrupted cutting
Voll- und leicht unterbrochener Schnitt

◔ Interrupted cutting
Stark unterbrochener Schnitt

Workpiece Material / Werkstoffe											
H	Hardened material / *Gehärtete Werkstoff*	●	◔	◔			
K	Cast iron / *Gusseisen*				●		
N	Non-ferrite material / *Ne Metalle*						

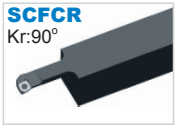
Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					CBN					
		L	I.C	S	d	r	YCB111	YCB121	YCB131	YCB211		
	**CCGW060204-1**	6.4	6.35	2.38	2.8	0.4	●	●				
	CCGW060208-1	6.4	6.35	2.38	2.8	0.8	●	●				
	CCGW09T304-2	9.7	9.525	3.97	4.4	0.4	●	●	○	●		
	CCGW09T308-2	9.7	9.525	3.97	4.4	0.8	●	●	○	●		
	CCGW120404-2	12.9	12.7	4.76	5.5	0.4	○	●	○	●		
	CCGW120408-2	12.9	12.7	4.76	5.5	0.8	○	●	○	●		

Tool Holder · Klemmhalter


SCACR/L
Kr:90°


SCLCR/L
Kr:95°


SCLCR/L
Kr:95°


SCFCR
Kr:90°

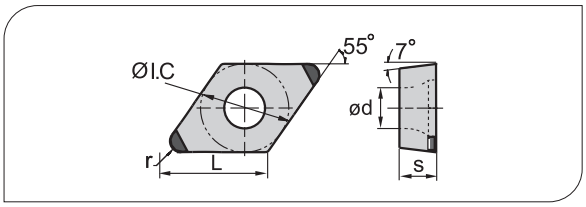

SCLCR
Kr:95°

Page ·Seite A185 A186 A224 A239 A240

● Ex Stock / ab Lager ○ On demand / auf Anfrage

A

DC**



● Continuous cutting
Vollschnitt

◐ Continuous and interrupted cutting
Voll- und leicht unterbrochener Schnitt

◔ Interrupted cutting
Stark unterbrochener Schnitt

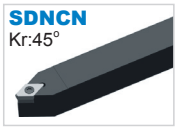
Workpiece Material *Werkstoffe*				
H	Hardened material / *Gehärtete Werkstoff*	●	◐	◔
K	Cast iron / *Gusseisen*			●
N	Non-ferrite material / *Ne Metalle*			

Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					CBN			
		L	I.C	S	d	r	YCB111	YCB121	YCB131	YCB211
	**DCGW070204-1**	7.8	6.35	2.38	2.8	0.4	●	●		
	DCGW070208-1	7.8	6.35	2.38	2.8	0.8	●	●		
	DCGW11T304-2	11.6	9.525	3.97	4.4	0.4	●	●	○	●
	DCGW11T308-2	11.6	9.525	3.97	4.4	0.8	●	●	○	●

Tool Holder · Klemmhalter


SDACR/L
Kr:90°
Page ·Seite A187


SDJCR/L
Kr:93°
A188


SDNCN
Kr:45°
A189

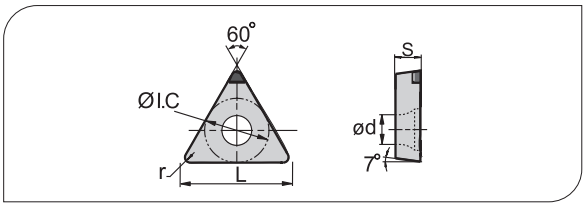

SDQCR/L
Kr:107°30'
A226


SDUCR/L
Kr:93°
A227


SDZCR/L
Kr:85°
A228

● Ex Stock / ab Lager ○ On demand / auf Anfrage

TC**



Continuous cutting
Vollschnitt

Continuous and interrupted cutting
Voll- und leicht unterbrochener Schnitt

Interrupted cutting
Stark unterbrochener Schnitt

Workpiece Material / Werkstoffe

H	Hardened material / *Gehärtete Werkstoff*	●	◔	✱
K	Cast iron / *Gusseisen*			●
N	Non-ferrite material / *Ne Metalle*			

Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					CBN			
		L	I.C	S	d	r	YCB111	YCB121	YCB131	YCB211
	**TCGW110204-1**	9.6	5.56	2.38	2.5	0.4	●	●	○	
	TCGW110208-1	9.6	5.56	2.38	2.5	0.8	●	●	○	
	**TCGW16T304-3**	16.5	9.525	3.97	4.4	0.4	●	●	○	○
	TCGW16T308-3	16.5	9.525	3.97	4.4	0.8	●	●	○	○

Tool Holder · Klemmhalter


STACR/L
Kr:90°


STFCR/L
Kr:91°


STGCR/L
Kr:91°

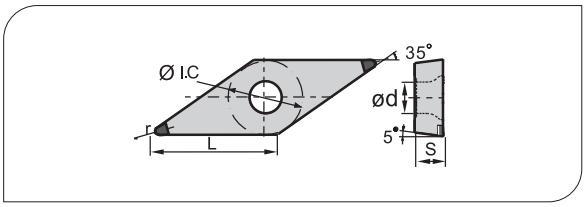

STTCR/L
Kr:60°


STFCR/L
Kr:90°

Page ·Seite A197 A197 A198 A199 A230

● Ex Stock / ab Lager ○ On demand / auf Anfrage

VB**



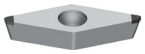
Continuous cutting
Vollschnitt

Continuous and interrupted cutting
Voll- und leicht unterbrochener Schnitt

Interrupted cutting
Stark unterbrochener Schnitt

Workpiece Material / Werkstoffe

H	Hardened material / *Gehärtete Werkstoff*	○	◔	✲				
K	Cast iron / *Gusseisen*				●			
N	Non-ferrite material / *Ne Metalle*							

Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					CBN					
		L	I.C	S	d	r	YCB111	YCB121	YCB131	YCB211		
	**VBGW160404-2**	16.6	9.525	4.76	4.4	0.4	●	●		●		
	VBGW160408-2	16.6	9.525	4.76	4.4	0.8	●	●		●		

Tool Holder · Klemmhalter





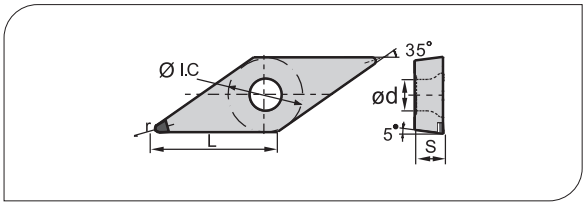






Page ·Seite A190 A191 A192 A233 A234

VC**



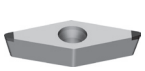
Continuous cutting
Vollschnitt

Continuous and interrupted cutting
Voll- und leicht unterbrochener Schnitt

Interrupted cutting
Stark unterbrochener Schnitt

Workpiece Material / Werkstoffe

H	Hardened material / *Gehärtete Werkstoff*	○	◔	✲				
K	Cast iron / *Gusseisen*				●			
N	Non-ferrite material / *Ne Metalle*							

Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					CBN					
		L	I.C	S	d	r	YCB111	YCB121	YCB131	YCB211		
	**VCGW160404-2**	16.6	9.525	4.76	4.4	0.4	●	●		●		
	VCGW160408-2	16.6	9.525	4.76	4.4	0.8	●	●		●		

Tool Holder · Klemmhalter





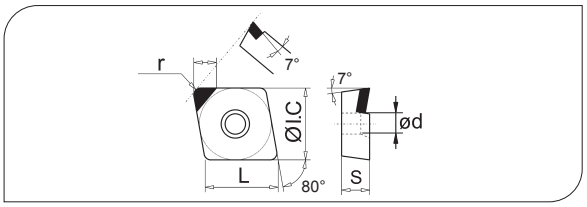




Page ·Seite A231 A232 A193 A194

● Ex Stock / ab Lager ○ On demand / auf Anfrage

CC**



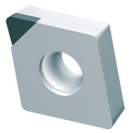
Continuous cutting
Vollschnitt

Continuous and interrupted cutting
Voll- und leicht unterbrochener Schnitt

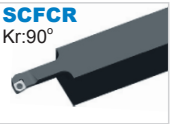
Interrupted cutting
Stark unterbrochener Schnitt

Workpiece Material
Werkstoffe

H	Hardened material / *Gehärtete Werkstoff*	
K	Cast iron / *Gusseisen*	
N	Non-ferrite material / *Ne Metalle*	●

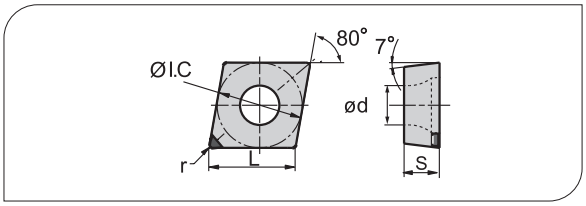
Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					PCD
		L	I.C	S	d	r	YCD421
	**CCMT060202**	6.4	6.35	2.38	2.8	0.2	○
	CCMT060204	6.4	6.35	2.38	2.8	0.4	○
	CCMT09T304	9.7	9.525	3.97	4.4	0.4	○
	CCMT09T308	9.7	9.525	3.97	4.4	0.8	○
	CCMT120404	12.9	12.7	4.76	5.56	0.4	○
	CCMT120408	12.9	12.7	4.76	5.56	0.8	○

Applicable tools

SCACR/L Kr:90°	**SCLCR/L** Kr:95°	**SCLCR/L** Kr:95°	**SCFCR** Kr:90°	**SCLCR** Kr:95°
				
Page A185	A186	A224	A239	A240

● Ex Stock / ab Lager ○ On demand / auf Anfrage

CC**



Continuous cutting
Vollschnitt

Continuous and interrupted cutting
Voll- und leicht unterbrochener Schnitt

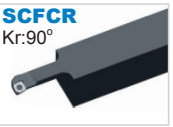
Interrupted cutting
Stark unterbrochener Schnitt

Workpiece Material / *Werkstoffe*

H	Hardened material / *Gehärtete Werkstoff*
K	Cast iron / *Gusseisen*
N	Non-ferrite material / *Ne Metalle*

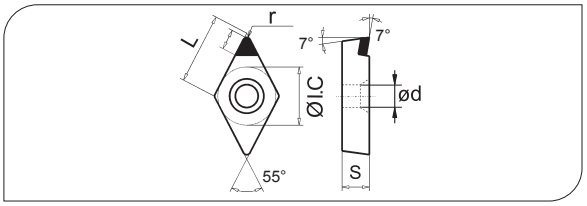
Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					PCD
		L	I.C	S	d	r	YCD421
	**CCMW060202**	6.4	6.35	2.38	2.8	0.2	●
	CCMW060204	6.4	6.35	2.38	2.8	0.4	●
	CCMW09T304	9.7	9.525	3.97	4.4	0.4	●
	CCMW09T308	9.7	9.525	3.97	4.4	0.8	●
	CCMW120404	12.9	12.7	4.76	5.56	0.4	●
	CCMW120408	12.9	12.7	4.76	5.56	0.8	●

Applicable tools

SCACR/L Kr:90°	**SCLCR/L** Kr:95°	**SCLCR/L** Kr:95°	**SCFCR** Kr:90°	**SCLCR** Kr:95°
				
Page A185	A186	A224	A239	A240

● Ex Stock / ab Lager ○ On demand / auf Anfrage

DC**



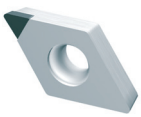
Continuous cutting
Vollschnitt

Continuous and interrupted cutting
Voll- und leicht unterbrochener Schnitt

Interrupted cutting
Stark unterbrochener Schnitt

Workpiece Material
Werkstoffe

H	Hardened material / *Gehärtete Werkstoff*	
K	Cast iron / *Gusseisen*	
N	Non-ferrite material / *Ne Metalle*	●

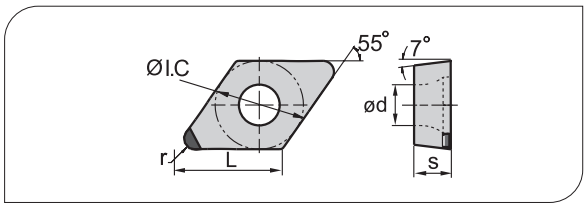
Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					PCD
		L	I.C	S	d	r	YCD421
	**DCMT070202**	7.8	6.35	2.38	2.8	0.2	○
	DCMT070204	7.8	6.35	2.38	2.8	0.4	○
	DCMT11T302	11.6	9.525	3.97	4.4	0.2	○
	DCMT11T304	11.6	9.525	3.97	4.4	0.4	○
	DCMT11T308	11.6	9.525	3.97	4.4	0.8	○

Applicable tools

SDACR/L Kr:90°	**SDJCR/L** Kr:93°	**SDNCN** Kr:62°30'	**SDQCR/L** Kr:107°30'	**SDUCR/L** Kr:93°	**SDZCR/L** Kr:85°
					
Page A187	A188	A189	A226	A227	A228

● Ex Stock / ab Lager ○ On demand / auf Anfrage

DC**



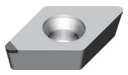
Continuous cutting
Vollschnitt

Continuous and interrupted cutting
Voll- und leicht unterbrochener Schnitt

Interrupted cutting
Stark unterbrochener Schnitt

Workpiece Material / Werkstoffe

H	Hardened material / *Gehärtete Werkstoff*
K	Cast iron / *Gusseisen*
N	Non-ferrite material / *Ne Metalle*

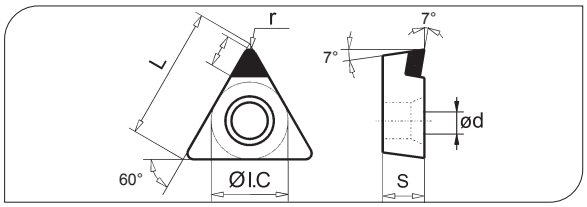
Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					PCD
		L	I.C	S	d	r	YCD421
	**DCMW070202**	7.8	6.35	2.38	2.8	0.2	●
	DCMW070204	7.8	6.35	2.38	2.8	0.4	●
	DCMW070208	7.8	6.35	2.38	2.8	0.8	●
	DCMW11T302	11.6	9.525	3.97	4.4	0.2	●
	DCMW11T304	11.6	9.525	3.97	4.4	0.4	●
	DCMW11T308	11.6	9.525	3.97	4.4	0.8	●

Applicable tools

SDACR/L Kr:90°	**SDJCR/L** Kr:93°	**SDNCN** Kr:62°30'	**SDQCR/L** Kr:107°30'	**SDUCR/L** Kr:93°	**SDZCR/L** Kr:85°
					
Page A187	A188	A189	A226	A227	A228

● Ex Stock / ab Lager ○ On demand / auf Anfrage

TC**



Continuous cutting
Vollschnitt

Continuous and interrupted cutting
Voll- und leicht unterbrochener Schnitt

Interrupted cutting
Stark unterbrochener Schnitt

Workpiece Material
Werkstoffe

H	Hardened material / *Gehärtete Werkstoff*
K	Cast iron / *Gusseisen*
N	Non-ferrite material / *Ne Metalle*

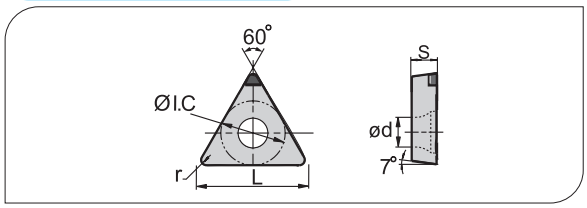
Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					PCD
		L	I.C	S	d	r	YCD421
	**TCMT110204**	11	6.35	2.38	2.8	0.4	○
	TCMT16T304	16.5	9.525	3.97	4.4	0.4	○
	TCMT16T308	16.5	9.525	3.97	4.4	0.8	○

Applicable tools

STACR/L Kr:90°	**STFCR/L** Kr:91°	**STGCR/L** Kr:91°	**STTCR/L** Kr:60°	**STFCR/L** Kr:90°
				
Page A197	A197	A198	A199	A230

● Ex Stock / ab Lager ○ On demand / auf Anfrage

TC**



Continuous cutting
Vollschnitt

Continuous and interrupted cutting
Voll- und leicht unterbrochener Schnitt

Interrupted cutting
Stark unterbrochener Schnitt

Workpiece Material / *Werkstoffe*

H	Hardened material / *Gehärtete Werkstoff*	
K	Cast iron / *Gusseisen*	
N	Non-ferrite material / *Ne Metalle*	●

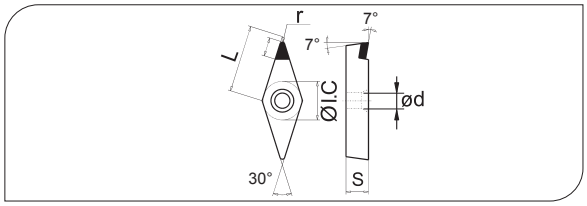
Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					PCD
		L	I.C	S	d	r	YCD421
	**TCMW110208**	11	6.35	2.38	2.8	0.8	●
	TCMW16T304	16.5	9.525	3.97	4.4	0.4	●
	TCMW16T308	16.5	9.525	3.97	4.4	0.8	●

Applicable tools

STACR/L Kr:90°	**STFCR/L** Kr:91°	**STGCR/L** Kr:91°	**STTCR/L** Kr:60°	**STFCR/L** Kr:90°
				
Page A197	A197	A198	A199	A230

● Ex Stock / ab Lager ○ On demand / auf Anfrage

VB**



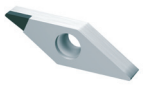
● Continuous cutting
Vollschnitt

◔ Continuous and interrupted cutting
Voll- und leicht unterbrochener Schnitt

◔ Interrupted cutting
Stark unterbrochener Schnitt

Workpiece Material / *Werkstoffe*

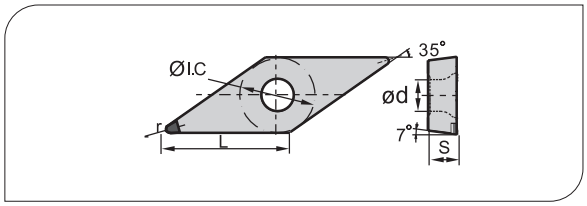
H	Hardened material / *Gehärtete Werkstoff*
K	Cast iron / *Gusseisen*
N	Non-ferrite material / *Ne Metalle*

Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					PCD
		L	I.C	S	d	r	YCD421
	**VBMT160404**	16.6	9.525	4.76	4.4	0.4	○
	VBMT160408	16.6	9.525	4.76	4.4	0.8	○

Applicable tools

SVJBR/L Kr:93° 	**SVABR/L** Kr:90° 	**SVVBN** Kr:72°30' 	**SVQBR/L** Kr:107°30' 	**SVUBR/L** Kr:93° 
Page A190	A191	A192	A233	A234

VB**



● Continuous cutting
Vollschnitt

◔ Continuous and interrupted cutting
Voll- und leicht unterbrochener Schnitt

◔ Interrupted cutting
Stark unterbrochener Schnitt

Workpiece Material / *Werkstoffe*

H	Hardened material / *Gehärtete Werkstoff*
K	Cast iron / *Gusseisen*
N	Non-ferrite material / *Ne Metalle*

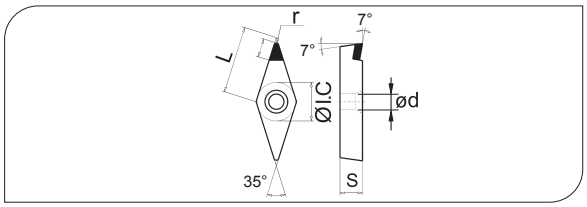
Insert shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					PCD
		L	I.C	S	d	r	YCD421
	**VBMW160404**	16.6	9.525	4.76	4.4	0.4	●
	VBMW160408	16.6	9.525	4.76	4.4	0.8	●

Applicable tools

SVJBR/L Kr:93° 	**SVABR/L** Kr:90° 	**SVVBN** Kr:72°30' 	**SVQBR/L** Kr:107°30' 	**SVUBR/L** Kr:93° 
Page A190	A191	A192	A233	A234

● Ex Stock / ab Lager ○ On demand / auf Anfrage

VC**



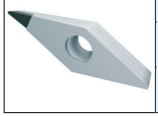
● Continuous cutting
Vollschnitt

◉ Continuous and interrupted cutting
Voll- und leicht unterbrochener Schnitt

✺ Interrupted cutting
Stark unterbrochener Schnitt

Workpiece Material / Werkstoffe

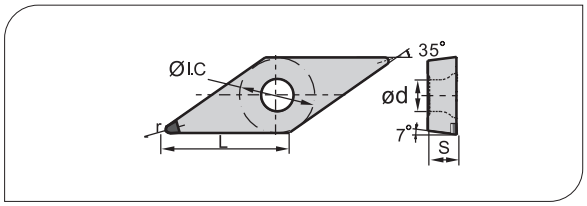
H	Hardened material / *Gehärtete Werkstoff*	
K	Cast iron / *Gusseisen*	
N	Non-ferrite material / *Ne Metalle*	●

Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					PCD
		L	I.C	S	d	r	YCD421
	**VCMT160404**	16.6	9.525	4.76	4.4	0.4	●
	VCMT160408	16.6	9.525	4.76	4.4	0.8	●

Applicable tools

SVJBR/L Kr:93° 	**SVABR/L** Kr:90° 	**SVVBN** Kr:72°30' 	**SVQBR/L** Kr:107°30' 	**SVUBR/L** Kr:93° 
Page A190	A191	A192	A233	A234

VC**



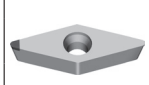
● Continuous cutting
Vollschnitt

◉ Continuous and interrupted cutting
Voll- und leicht unterbrochener Schnitt

✺ Interrupted cutting
Stark unterbrochener Schnitt

Workpiece Material / Werkstoffe

H	Hardened material / *Gehärtete Werkstoff*	
K	Cast iron / *Gusseisen*	
N	Non-ferrite material / *Ne Metalle*	●

Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					PCD
		L	I.C	S	d	r	YCD421
	**VCMW160404**	16.6	9.525	4.76	4.4	0.4	●
	VCMW160408	16.6	9.525	4.76	4.4	0.8	●

Applicable tools

SVJBR/L Kr:93° 	**SVABR/L** Kr:90° 	**SVVBN** Kr:72°30' 	**SVQBR/L** Kr:107°30' 	**SVUBR/L** Kr:93° 
Page A190	A191	A192	A233	A234

● Ex Stock / ab Lager ○ On demand / auf Anfrage

Troubleshooting - PCBN Cutting Materials
Problembehandlung - PCBN Schneidstoffe

For inverstigation please send us used inserts. If breakage is problem please use inserts only 80-90% of expected tool life because broken inserts almost have no information.

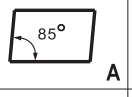
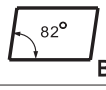
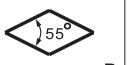
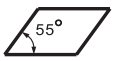
Für eine genaue Untersuchung schicken Sie uns bitte die gebrauchten WSP zu. Sollte Bruch das Problem sein, setzen Sie die Platte nur 80-90% der eigentlichen Standzeit ein, denn eine gebrochene Platte enthält keine Informationen mehr.

Wear phenomenon	Solution	
	Geometry	Cutting condition
Flank wear	Sharp cutting edge to reduce cutting force - smaller negative lend - change to positiv inserts	Reduce cutting speed - increase feed rate to minimise contact time
Notch wear	Bigger nose radius	Use method of altering feed rate
Crater wear/ Breakage due to crater wear	Crater wear · Breakage due to crater wear	Reduce cutting spped - increase feed rate to minimise contact time and increase distance between cutting edge and crater
Chipping due to rough condition or vibration	Bigger negative lend; angle and ·or honing	Increase feed rate to reduce number of hits
Fraking	Sharp cutting edge to reduce cutting force - smaller negative lend - change to positiv inserts	Increase feed rate to reduce cutting time
Thermal crack	Sharp cutting edge to reduce cutting force - smaller negative lend - change to positiv inserts	Reduce cutting speed, feed rate and depth of cut. Use dry machining.
Chipping	Bigger negative lend	Increase cutting speed to reduce cutting force

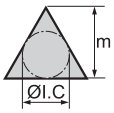
Verschleißbild	Gegenmaßnahmen	
	Geometrie	Schnittbedingungen
Freiflächenverschleiß	Schärfere Schneidkante für weniger Schnittkraft - kleinere Negativfase - positive Platten verwenden	Schnittgeschwindigkeit reduzieren - Vorschubes erhöhen um Eingriffszeit zu reduzieren
Kerbverschleiß	Größerer Radius	“Methode des varierenden Vorschub`s” verwenden
Kolkverschließ/ Kolkbruch		- Schnittgeschwindigkeit reduzieren - Vorschubes erhöhen um Kontakzeit zu verringern und den Abstand zwischen Schneidkante und Kolktasche zu vergrößern.
Ausbrüche durch Schlagwirkung oder Vibrationen	Größere Negativfase Winkel und · oder gehonte Fase	- Vorschub erhöhen, um die Anzahl der Schläge zu reduzieren
Schalenförmige Ausplatzungen	Schärfere Schneidkante für weniger Schnittkraft - kleinere Negativfase - positive Platten verwenden	- Vorschub erhöhen, um Eingriffszeit zu reduzieren
Thermische Risse · Bruch	Schärfere Schneidkante für weniger Schnittkraft - kleinere Negativfase - positive Platten verwenden	Schnittgeschwindigkeit, Vorschub und Schnittiefe reduzieren. Trockenbearbeitung
Ausbrüche	Größere Negativfase	Schnittgeschwindigkeit erhöhen um Schnittkraft zu reduzieren

● Ex Stock / ab Lager ○ On demand / auf Anfrage

Insert Shape / Schneidplattenform

 A	 B	 C
 D	 E	 H
 K	 L	 M
 P	 S	 T
 V	 W	Others Z

Tolerance / Toleranzklasse

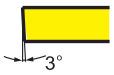
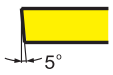
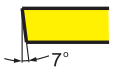
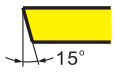
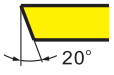
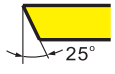
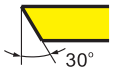
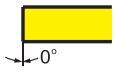
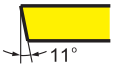




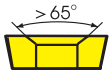
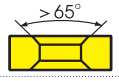
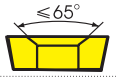
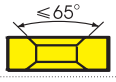
Code	Tolerance	Incircle Tolerence ØI.C	Thickness S	Code	Tolerence	Tolerence ØI.C	Thickness S
A	±0.005	±0.025	±0.025	J	±0.005	±0.05-±0.13	±0.025
F	±0.005	±0.013	±0.025	K	±0.013	±0.05-±0.13	±0.025
C	±0.013	±0.025	±0.025	L	±0.025	±0.05-±0.13	±0.025
H	±0.013	±0.013	±0.025	M	±0.08-±0.18	±0.05-±0.13	±0.13
E	±0.025	±0.025	±0.025	N	±0.08-±0.18	±0.05-±0.13	±0.025
G	±0.025	±0.025	±0.13	U	±0.13-±0.38	±0.08-±0.25	±0.13

T N G A

Clearance angle of main cutting edge
Freiwinkel der Hauptschneide

code	angle / *Winkel*	code	angle / *Winkel*
A	 3°	B	 5°
C	 7°	D	 15°
E	 20°	F	 25°
G	 30°	N	 0°
P	 11°	O	Others

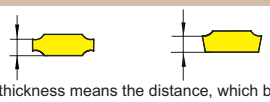
Insert type / *Plattentyp*

Code	hole	Insert Section
N	No	
B	Yes	
C	Yes	
A	Yes	
W	Yes	
Q	Yes	
X	----	Special

Cutting edge length / *Schneidenlänge (mm)*

Diameter of incircle (mm)	insert shape					
	C	D	S	T	V	W
3.97				06		
5.0						
5.56				09		
6.0						
6.35	06	07		11	11	
8.0						
9.525	09	11	09	16	16	06
10.0						
12.0						
12.7	12	15	12	22	22	08
15.875	16		15	27		
16.0		19				
19.05	19		19	33		
20.0						
25.0	25	25				
25.4			25			
31.75						
32						

Insert thickness / *Dicke* (mm)



the thickness means the distance, which between the highest part of cutting edge and insert bottom

code	Insert thickness	code	Insert thickness
02	2.38	06	6.35
T2	2.58	T6	6.75
03	3.18	07	7.94
T3	3.97	09	9.52
04	4.76	T9	9.72
T4	4.96	11	11.11
05	5.56	12	12.70
T5	5.95		

Nose radius *Eckenradius*

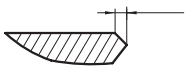
code	Radius (mm)
00	no Radius
02	0.2
04	0.4
08	0.8
12	1.2
16	1.6
20	2.0
24	2.4
32	3.2
X	Others
Insert diameter Mo (metric)	Runde insert

12 04 08 T 020 20

Profile of cutting edges *Schneidkantenausführung*

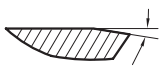
code		diagram
E	Honing *Verrundung*	
T	Chamfering *Fase*	
S	Chamfering *Fase* + Honing *Verrundung*	
F	Sharp edges *Scharfe Kante*	

width of chamfer *Breite der Fase*

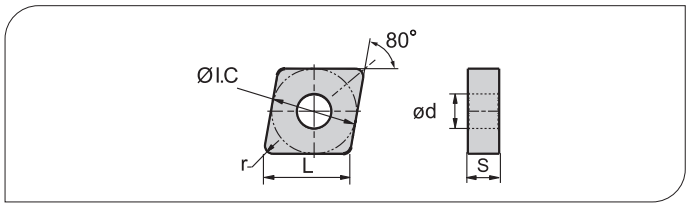


010	0.10	040	0.40
015	0.15	045	0.45
020	0.20	050	0.50
025	0.25	100	1.00
030	0.30	200	2.00
035	0.35		

angle of chamfer *Winkel der Fase*



05	5°
10	10°
15	15°
20	20°
25	25°
30	30°



Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen

Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

Workpiece Material Werkstoffe				
P	Steel / *Stahl*	●		
K	Cast iron / *Gusseisen*	●	● ✱	✱

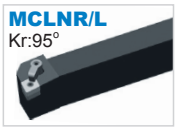
Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Grade · Sorte		
		L	I.C	S	d	r	CA1000	CN1000	CN2000
	**CNGA120404T02020**	12.9	12.7	4.76	5.16	0.4		●	
	CNGA120408T02020	12.9	12.7	4.76	5.16	0.8		●	
	CNGA120412T02020	12.9	12.7	4.76	5.16	1.2		●	
	CNGA120412T03020	12.9	12.7	4.76	5.16	1.2		○	
	CNGA160608T02020	16.1	15.875	6.35	6.35	0.8		○	
	CNGA160612T02020	16.1	15.875	6.35	6.35	1.2		●	
	CNGA160616T02020	16.1	15.875	6.35	6.35	1.6		●	

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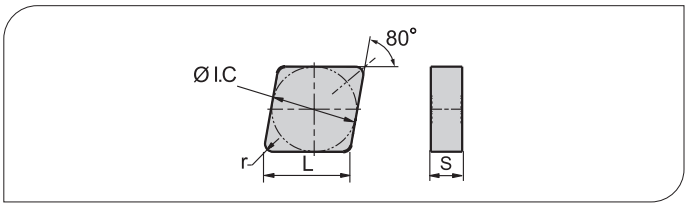






Page ·Seite A158 A159 A170 A171 A216

● Ex Stock / ab Lager ○ On demand / auf Anfrage



Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen

Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

Workpiece Material Werkstoffe				
P	Steel / *Stahl*	●		
K	Cast iron / *Gusseisen*	●	● ✱	✱

Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Grade · Sorte		
		L	I.C	S	d	r	CA1000	CN1000	CN2000
	**CNGN120404T02020**	12.9	12.7	4.76	-	0.4	○	○	○
	CNGN120408T02020	12.9	12.7	4.76	-	0.8	●	●	●
	CNGN120412T02020	12.9	12.7	4.76	-	1.2	●	○	○
	CNGN120708T02020	12.9	12.7	7.94	-	0.8	○	○	●
	CNGN120712T02020	12.9	12.7	7.94	-	1.2	●	○	○
	CNGN120716T02020	12.9	12.7	7.94	-	1.6	○	○	○
	CNGN160408T02020	16.1	15.875	4.76	-	0.8	○		
	CNGN160412T02020	16.1	15.875	4.76	-	1.2	○	○	○
	CNGN160416T02020	16.1	15.875	4.76	-	1.6	○	○	○
	CNGN160612T02020	16.1	15.875	6.35	-	1.2	○	○	
	CNGN160616T02020	16.1	15.875	6.35	-	1.6	○	○	○

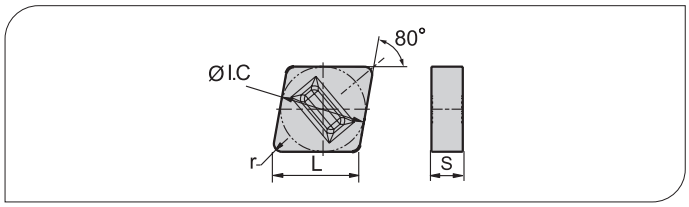
Tool Holder · Klemmhalter

CCLNR/L
Kr:95°



Page ·Seite A204

● Ex Stock / ab Lager ○ On demand / auf Anfrage



Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen
Ideal Machining Condition
Gute Bearbeitungsbedingungen
Normal Machining Condition
Normale Bearbeitungsbedingungen

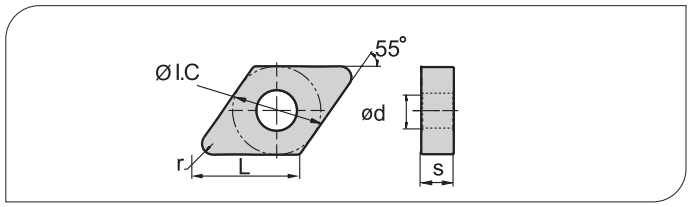
Workpiece Material *Werkstoffe*
P Steel / *Stahl*
K Cast iron / *Gusseisen*

Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Grade · Sorte		
		L	I.C	S	d	r	CA1000	CN1000	CN2000
	**CNGX120712T02020**	12.9	12.7	7.94	-	1.2		●	
	CNGX120716T02020	12.9	12.7	7.94	-	1.6		●	

Tool Holder · Klemmhalter

JCLNR/L
Kr:95°


Page ·Seite A208



Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen
Ideal Machining Condition
Gute Bearbeitungsbedingungen
Normal Machining Condition
Normale Bearbeitungsbedingungen

Workpiece Material *Werkstoffe*
P Steel / *Stahl*
K Cast iron / *Gusseisen*

Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Grade · Sorte		
		L	I.C	S	d	r	CA1000	CN1000	CN2000
	**DNGA150604T02020**	15.5	12.7	6.35	5.16	0.4		●	
	DNGA150608T02020	15.5	12.7	6.35	5.16	0.8		●	
	DNGA150612T02020	15.5	12.7	6.35	5.16	1.2		○	
	DNGA150616T02020	15.5	12.7	6.35	5.16	1.6		○	

Tool Holder · Klemmhalter

PDJNR/L
Kr:93°


PDNNR/L
Kr:63°


MDJNR/L
Kr:93°

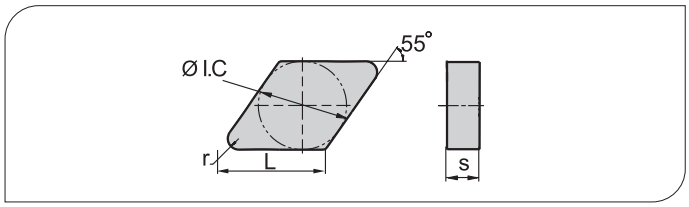

MDPNN
Kr:62°30'


PDSNR/L
Kr:62°30'


PDUNR/L
Kr:93°


Page ·Seite A160 A161 A172 A173 A218 A219

● Ex Stock / ab Lager ○ On demand / auf Anfrage



Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen
Ideal Machining Condition
Gute Bearbeitungsbedingungen
Normal Machining Condition
Normale Bearbeitungsbedingungen

Workpiece Material / Werkstoffe

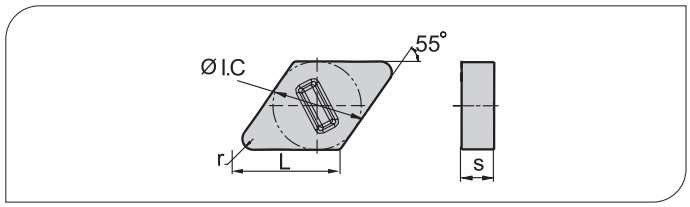
P	Steel / *Stahl*	●		
K	Cast iron / *Gusseisen*	●	● ✱	✱

Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Grade · Sorte		
		L	I.C	S	d	r	CA1000	CN1000	CN2000
	**DNGN150408T02020**	15.5	12.7	4.76	-	0.8	○		
	DNGN150412T02020	15.5	12.7	4.76	-	1.2	○		
	DNGN150704T02020	15.5	12.7	7.94	-	0.4	○	○	○
	DNGN150708T02020	15.5	12.7	7.94	-	0.8	●	○	○
	DNGN150712T02020	15.5	12.7	7.94	-	1.2	○	○	○
	DNGN150716T02020	15.5	12.7	7.94	-	1.6	○		

Tool Holder · Klemmhalter



Page ·Seite A205



Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen
Ideal Machining Condition
Gute Bearbeitungsbedingungen
Normal Machining Condition
Normale Bearbeitungsbedingungen

Workpiece Material / Werkstoffe

P	Steel / *Stahl*	●		
K	Cast iron / *Gusseisen*	●	● ✱	✱

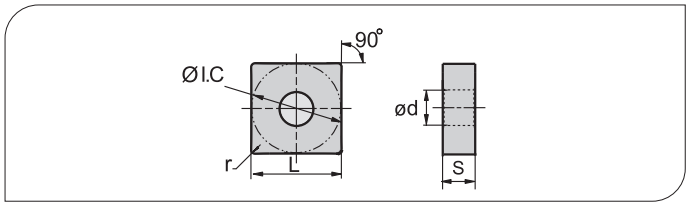
Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Grade · Sorte		
		L	I.C	S	d	r	CA1000	CN1000	CN2000
	**DNGX150712T02020**	15.5	12.7	7.94	-	1.2		●	
	DNGX150716T02020	15.5	12.7	7.94	-	1.6		●	

Tool Holder · Klemmhalter



Page ·Seite A208

● Ex Stock / ab Lager ○ On demand / auf Anfrage



Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen
Ideal Machining Condition
Gute Bearbeitungsbedingungen
Normal Machining Condition
Normale Bearbeitungsbedingungen

Workpiece Material *Werkstoffe*

P	Steel / *Stahl*	●		
K	Cast iron / *Gusseisen*	●	● ✱	✱

Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Grade · Sorte		
		L	I.C	S	d	r	CA1000	CN1000	CN2000
	**SNGA120404T02020**	12.7	12.7	4.76	5.16	0.4		○	
	SNGA120408T02020	12.7	12.7	4.76	5.16	0.8		●	
	SNGA120412T02020	12.7	12.7	4.76	5.16	1.2		●	
	SNGA120412T03020	12.7	12.7	4.76	5.16	1.2		○	
	SNGA120416T02020	12.7	12.7	4.76	5.16	1.6		○	
	SNGA120416T03020	12.7	12.7	4.76	5.16	1.6		○	

Tool Holder · Klemmhalter

PSBNR/L Kr:75° 
PSDNN Kr:45° 
PSKNR/L Kr:75° 
PSSNR/L Kr:45° 
MSBNR/L Kr:75° 
MSRNR/L Kr:75° 
MSKNR/L Kr:75° 

Page ·Seite A162 | A163 | A164 | A165 | A174 | A175 | A176

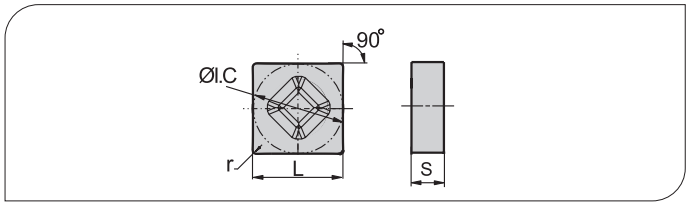
MSDNN Kr:45° 
PSKNR/L Kr:75° 

Page ·Seite A177 | A221

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen
Ideal Machining Condition
Gute Bearbeitungsbedingungen
Normal Machining Condition
Normale Bearbeitungsbedingungen

Workpiece Material *Werkstoffe*

P	Steel / *Stahl*	●		
K	Cast iron / *Gusseisen*	●	● ✱	✱



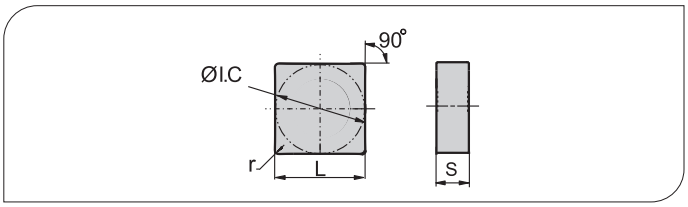
Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Grade · Sorte		
		L	I.C	S	d	r	CA1000	CN1000	CN2000
	**SNGX120708T02020**	12.7	12.7	7.94	-	0.8		○	
	SNGX120712T02020	12.7	12.7	7.94	-	1.2		○	
	SNGX120716T02020	12.7	12.7	7.94	-	1.6		●	

Tool Holder · Klemmhalter

JSDNN Kr:45° 

Page ·Seite A209

● Ex Stock / ab Lager ○ On demand / auf Anfrage



Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen

Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

Workpiece Material Werkstoffe				
P	Steel / *Stahl*	●		
K	Cast iron / *Gusseisen*	●	● ✱	✱

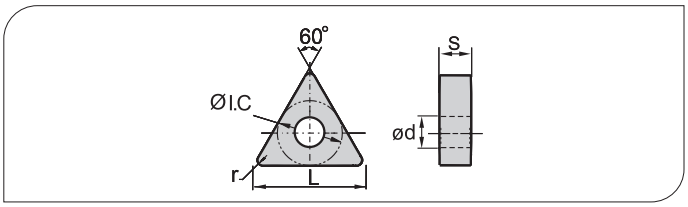
Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Grade · Sorte		
		L	I.C	S	d	r	CA1000	CN1000	CN2000
	**SNGN090308T01020**	9.525	9.525	3.18	-	0.8	○		
	SNGN090312T01020	9.525	9.525	3.18	-	1.2	○		
	SNGN120404T02020	12.7	12.7	4.76	-	0.4	○		
	SNGN120408T02020	12.7	12.7	4.76	-	0.8	●	●	○
	SNGN120412T02020	12.7	12.7	4.76	-	1.2	●	●	●
	SNGN120412T03020	12.7	12.7	4.76	-	1.2		○	
	SNGN120416T02020	12.7	12.7	4.76	-	1.6	○	○	○
	SNGN120704T02020	12.7	12.7	7.94	-	0.4	●		
	SNGN120708T02020	12.7	12.7	7.94	-	0.8	○	○	●
	SNGN120712T02020	12.7	12.7	7.94	-	1.2	●	●	○
	SNGN120716T02020	12.7	12.7	7.94	-	1.6	●		●
	SNGN150708T02020	15.875	15.875	7.94	-	0.8	○		
	SNGN150712T02020	15.875	15.875	7.94	-	1.2	●	○	○
	SNGN150716T02020	15.875	15.875	7.94	-	1.6	●	○	○
	SNGN190708T03020	19.05	19.05	7.94	-	0.8	○		
	SNGN190712T03020	19.05	19.05	7.94	-	1.2	○		
	SNGN190716T03020	19.05	19.05	7.94	-	1.6	○		
	SNGN190724T03020	19.05	19.05	7.94	-	2.4	○		
	SNGN191024T04020	19.05	19.05	10.05	-	2.4	○		
	SNGN251024T10015	25.4	25.4	10.05	-	2.4	○		

Tool Holder · Klemmhalter



Page ·Seite A206

● Ex Stock / ab Lager ○ On demand / auf Anfrage



Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen

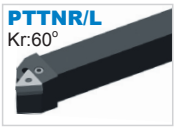
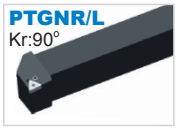
Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

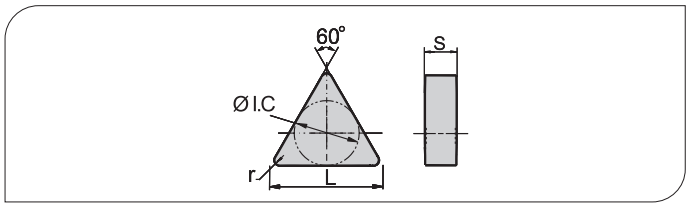
Workpiece Material / Werkstoffe				
P	Steel / *Stahl*	●		
K	Cast iron / *Gusseisen*	●	● ✱	✱

Insert Shape Schneidplattenform	Type · Typ	Dimension (mm) Abmessung					Grade · Sorte		
		L	I.C	S	d	r	CA1000	CN1000	CN2000
	**TNGA160404T01020**	16.50	9.525	4.76	3.86	0.4		●	
	TNGA160408T02020	16.50	9.525	4.76	3.86	0.8		●	
	TNGA160412T02020	16.50	9.525	4.76	3.86	1.2		●	
	TNGA220408T02020	22.00	12.7	4.76	5.16	0.8		○	
	TNGA220412T02020	22.00	12.7	4.76	5.16	1.2		○	
	TNGA220416T02020	22.00	12.7	4.76	5.16	1.6		○	
	TNGA220416T03020	22.00	12.7	4.76	5.16	1.6		○	

Tool Holder · Klemmhalter

PTFNR/L Kr:90°	**PTTNR/L** Kr:60°	**PTGNR/L** Kr:90°	**MTGNR/L** Kr:90°	**MTJNR/L** Kr:93°	**MTFNR/L** Kr:90°	**PTFNR/L** Kr:90°
						
Page ·Seite A166	A167	A168	A178	A179	A180	A222

● Ex Stock / ab Lager ○ On demand / auf Anfrage



Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen

Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

Workpiece Material Werkstoffe				
P	Steel / *Stahl*	●		
K	Cast iron / *Gusseisen*	●	● ✱	✱

Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Grade · Sorte		
		L	I.C	S	d	r	CA1000	CN1000	CN2000
	**TNGN160404T02020**	16.50	9.525	4.76	-	0.4	○	○	○
	TNGN160408T02020	16.50	9.525	4.76	-	0.8	●	○	○
	TNGN160412T02020	16.50	9.525	4.76	-	1.2	●	○	●
	TNGN160708T02020	16.50	9.525	7.94	-	0.8	●	○	●
	TNGN160712T02020	16.50	9.525	7.94	-	1.2	○	○	○
	TNGN160716T02020	16.50	9.525	7.94	-	1.6	○		
	TNGN220408T02020	22.00	12.7	4.76	-	0.8	○	○	○
	TNGN220412T02020	22.00	12.7	4.76	-	1.2	○	○	○
	TNGN220416T02020	22.00	12.7	4.76	-	1.6	○	○	○
	TNGN220712T02020	22.00	12.7	7.94	-	1.2	○		
	TNGN220716T02020	22.00	12.7	7.94	-	1.6	○		

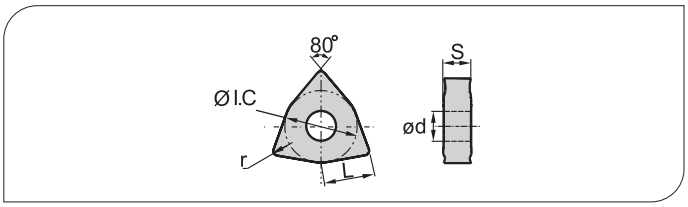
Tool Holder · Klemmhalter

CTJNR/L
Kr:93°



Page ·Seite A204

● Ex Stock / ab Lager ○ On demand / auf Anfrage



Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen
Ideal Machining Condition
Gute Bearbeitungsbedingungen
Normal Machining Condition
Normale Bearbeitungsbedingungen

Workpiece Material *Werkstoffe*
P Steel / *Stahl*
K Cast iron / *Gusseisen*

Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Grade · Sorte		
		L	I.C	S	d	r	CA1000	CN1000	CN2000
	**WNGA080408T02020**	8.69	12.7	4.76	5.16	0.8		●	
	WNGA080412T02020	8.69	12.7	4.76	5.16	1.2		●	
	WNGA080416T02020	8.69	12.7	4.76	5.16	1.6		●	

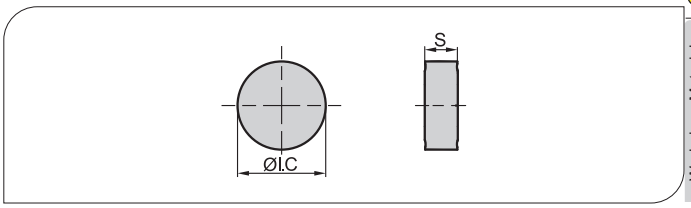
Tool Holder · Klemmhalter







Page ·Seite A169 A183 A223



Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen
Ideal Machining Condition
Gute Bearbeitungsbedingungen
Normal Machining Condition
Normale Bearbeitungsbedingungen

Workpiece Material *Werkstoffe*
P Steel / *Stahl*
K Cast iron / *Gusseisen*

Insert Shape Schneid-plattenform	Type · Typ	Dimension (mm) Abmessung					Grade · Sorte		
		L	I.C	S	d	r	CA1000	CN1000	CN2000
	**RNGN090400T02020**	---	9.53	4.76	---	---	○		
	RNGN120400T02020	---	12.7	4.76	---	---	○	○	●
	RNGN120700T02020	---	12.7	7.94	---	---	●	○	●
	RNGN150700T02020	---	15.875	7.94	---	---	●	○	
	RNGN190700T03020	---	19.05	7.94	---	---	○	○	○
	RNGN251000T05020	---	25.40	10.05	---	---	○	○	

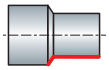
Tool Holder · Klemmhalter

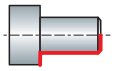


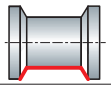
Page ·Seite A207

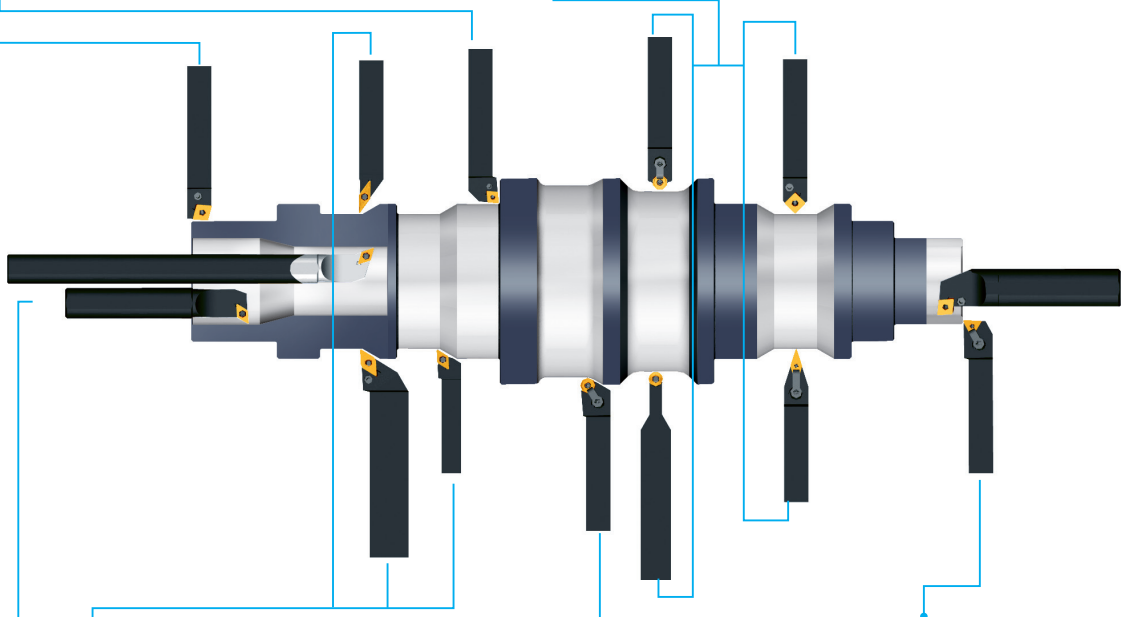


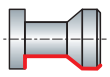
External and internal turning · Außen- und Innenbearbeitung

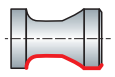
External Turning · Außenbearbeitung	Type · Typ					
	PCBNR/ L**	PSBNR/ L**	PSSN *	PTGNR/ L**	PTTNR/ L**	MCBNR/ L**
	MSBNR/ L**	MSRNR/ L**	MTGNR/ L**	MTJNR/ L**	SCACR/ L**	SSBCR/ L**
	SSSCR/ L**	STACR/ L**	STGCR/ L**	STTCR/ L**	SWACR/ L**	

External facing & turning · Außen- & Planbearbeitung	Type · Typ	
	PCLNR/ L**	PWLNR/ L**
	MCLNR/ L**	MWLNR/ L**
	SCLCR/ L**	

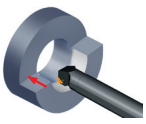
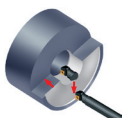
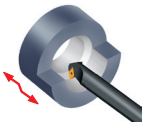
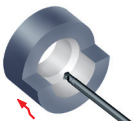
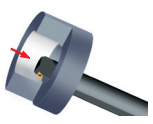
Profiling · Profilbearbeitung	Type · Typ			
	PDNNR/ L**	PSDNN**	MDPNN**	MSDNN**
	MVVNN**	MRDNN**	SDNCN**	SVVBN**
	SVVCN**	SSDCN**	SRDCN**	CKNNR/ L**

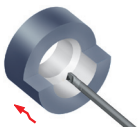
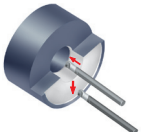
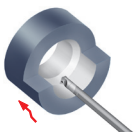


Profiling · Profilbearbeit.	Type · Typ		
	PDJNR/ L**	MDJNR/ L**	MVJNR/ L**
	SDACR/ L**	SDJCR/ L**	SVABR/ L**
	SVJBR/ L**	SVJCR/ L**	CKJNR/ L**

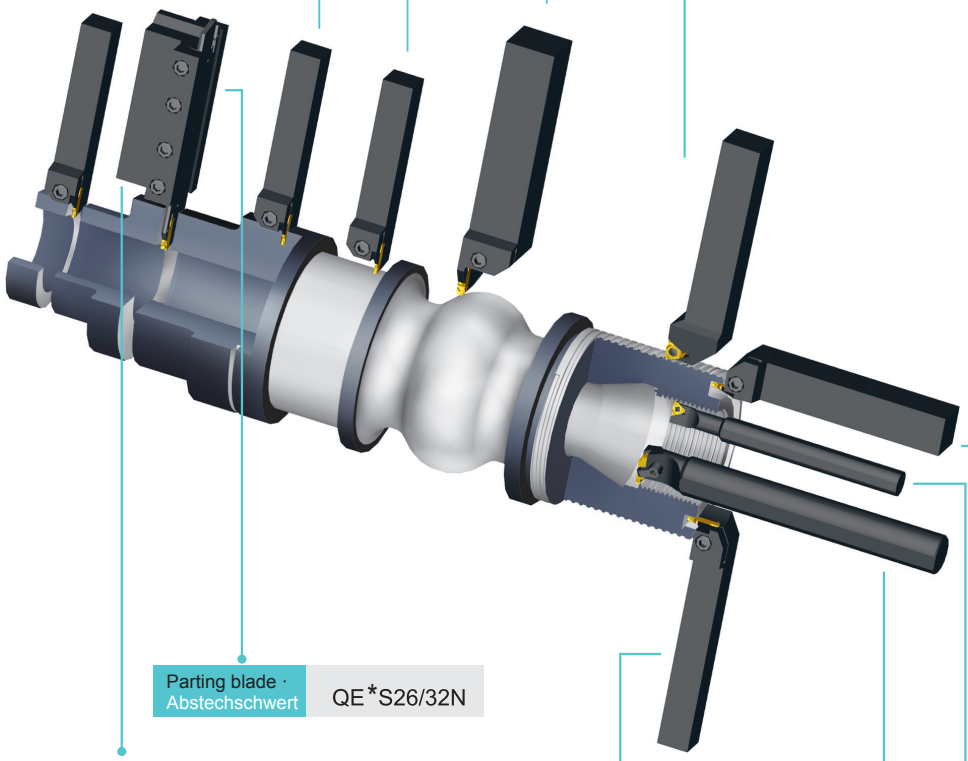
Profiling · Profilbearbeit.	Type · Typ
	MRGNR/ L**
	SRGCR/ L**

Facing · Planbearbeitung	Type · Typ	
	PSKNR/ L**	PTFNR/ L**
	MSKNR/ L**	MTFNR/ L**
	SSKCR/ L**	STFCR/ L**

Toolholders for internal turning (Steel toolholder) Klemmhalter Innenbearbeitung (Stahlausführung)						
						
	S*-PSKNR/ L*	S*-PCLNR/ L*	S*-PDSNR/ L*	S*-PDUNR/ L*	S*-SDQCR/ L*	S*-SDZCR/ L*
	S*-PTFNR/ L*	S*-PWLNR/ L*		S*-SDUCR/ L*	S*-SDQPR/ L*	
	S*-SCFCR*	S*-SCLCR/ L*		S*-SDUNR/ L*	S*-SVQBR/ L*	
	S*-SSKCR/ L*	S*-SCLPR/ L*		S*-SDUPR/ L*	S*-SVQCR/ L*	
	S*-STFCR/ L*			S*-SVUBR/ L*		
	S*-STUPR/ L*			S*-SVUCR/ L*		

Toolholders for internal turning (Cemented carbide) Klemmhalter Innenbearbeitung (Hartmetall)				
				
	C*-STUPR/ L*	C*-SCLPR/ L*	C*-SDUPR/ L*	C*-SDQPR/ L*
			C*-SVUCR/ L*	C*-SVQCR/ L*

Parting, Grooving and Threading Tools · Abstech-, Einstech-, und Gewindewerkzeug



External threading tools · Gewindedrehwerkzeuge (Außen)	SWR/ L*
Axial grooving tools · Axial Stechwerkzeuge	QF*D**R/ L*-*H
Parting blade · Abstechschwert	QE*S26/32N
Parting blade holder · Abstechschwert Halter	QZS *26/32
Internal threading tools · Gewindedrehwerkzeug (Innen)	SNR/ L*
External parting, grooving, turning and profile · Aussenbearbeitung, Abstechen-, Einstechen, Profilbearbeitung	QE*D*R/L
	QZQ*R/L
	ZQS*R/L
	QT*R
Presicion grooving and turning · Präzision Stechen & Drehen	QECD*R/L025
External profiling Profilbearbeitung (Außen)	QX*D*R/L* -45
Grooving (difficult material) Stechbearbeitung (schwier. Mat.)	QE*S*R/L*-* N
Internal grooving tools · Einstechwerkzeug (Innen)	C*Q*DR/ L*
	C*-QZSR/ L*
Axial grooving tools · Axial Stechwerkzeuge	QF*D*R/ L*-*L

NOTIZEN:

Turning · Drehen

External Turning Tools · Drehwerkzeuge zur Außenbearbeitung

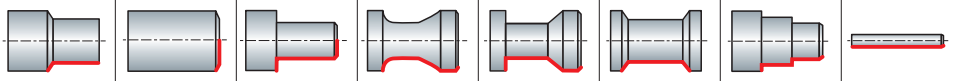
Turning tools overview · **Drehwerkzeuge Übersicht**	**A152-A155**
Turning tools code key · **ISO Kennzeichnung**	**A156-A157**
Detailed table of external turning tools **Drehwerkzeuge zur Außenbearbeitung**	**A158-A210**
Turning toolholders by P type clamping · Drehwerkzeuge / P Klemmung	A158-A169
Turning toolholders by M type clamping · Drehwerkzeuge / M Klemmung	A170-A184
Turning toolholders by S type clamping · Drehwerkzeuge / S Klemmung	A185-A202
Turning toolholders by C type clamping · Drehwerkzeuge / C Klemmung	A203
Detailed table of external turning tools (Ceramic) **Drehwerkzeuge zur Außenbearbeitung für Kermik WSP**	**A204-A210**

External truning tools Overview · Drehwerkzeugen zur Außenbearbeitung Übersicht

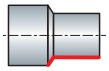
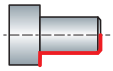
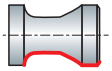
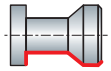
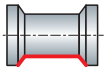
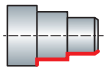
Clamping system Klemmsystem	Tool Type Werkzeug Typ	Approach angle Einstellwinkel	Turning Application · Anwendung						Workpiece · Werkstück		Page · Seite
			External turning Außenbearbeit.	Facing Planbearbeit.	Ext., turning & facing · Außen, & Planbearbeit.	Profiling Profilbearbeit.	Profiling Profilbearbeit.	Profiling Profilbearbeit..	Stable Stabil	Unstable Instabil	
P	PCBNR/ L	75	✓						✓		A158
	PCLNR/ L	95			✓				✓		A159
	PDJNR/ L	93					✓		✓	✓	A160
	PDNNR/ L	63						✓	✓		A161
	PSBNR/ L	75	✓						✓		A162
	PSDNN	45						✓	✓		A163
	PSKNR/ L	75		✓					✓		A164
	PSSNR/ L	45	✓						✓		A165
	PTFNR/ L	90		✓					✓	✓	A166
	PTTNR/ L	60	✓						✓		A167
	PTGNR/ L	90	✓						✓	✓	A168
	PWLNR/ L	95			✓				✓		A169

✓ Recommended · Empfehlung

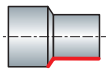
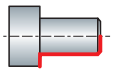
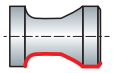
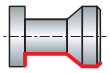
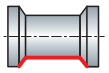
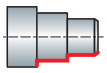
External truning tools Overview · Drehwerkzeugen zur Außenbearbeitung Übersicht

Clamping system Klemmsystem	Tool Type Werkzeug Typ	Approach angle Einstellwinkel	Turning Application · Anwendung						Workpiece · Werkstück		Page · Seite
			External turning Außenbearbeit.	Facing Planbearbeit.	Ext., turning & facing · Außen, & Planbearbeit.	Profiling Profilbearbeit.	Profiling Profilbearbeit.	Profiling Profilbearbeit.	Stable Stabil	Unstable Instabil	
											
M	MCBNR/ L 	75	✓						✓		A170
	MCLNR/ L 	95			✓				✓		A171
	MDJNR/ L 	93					✓		✓	✓	A172
	MDPNN 	62.5						✓	✓		A173
	MSBNR/ L 	75	✓						✓		A174
	MSRNR/ L 	75	✓						✓		A175
	MSKNR/ L 	75		✓					✓		A176
	MSDNN 	45						✓	✓		A177
	MTGNR/ L 	90	✓						✓	✓	A178
	MTJNR/ L 	93	✓						✓		A179
	MTFNR/ L 	90		✓					✓		A180
	MVVNN 	72.5						✓	✓		A181
	MVJNR/ L 	93					✓		✓	✓	A182

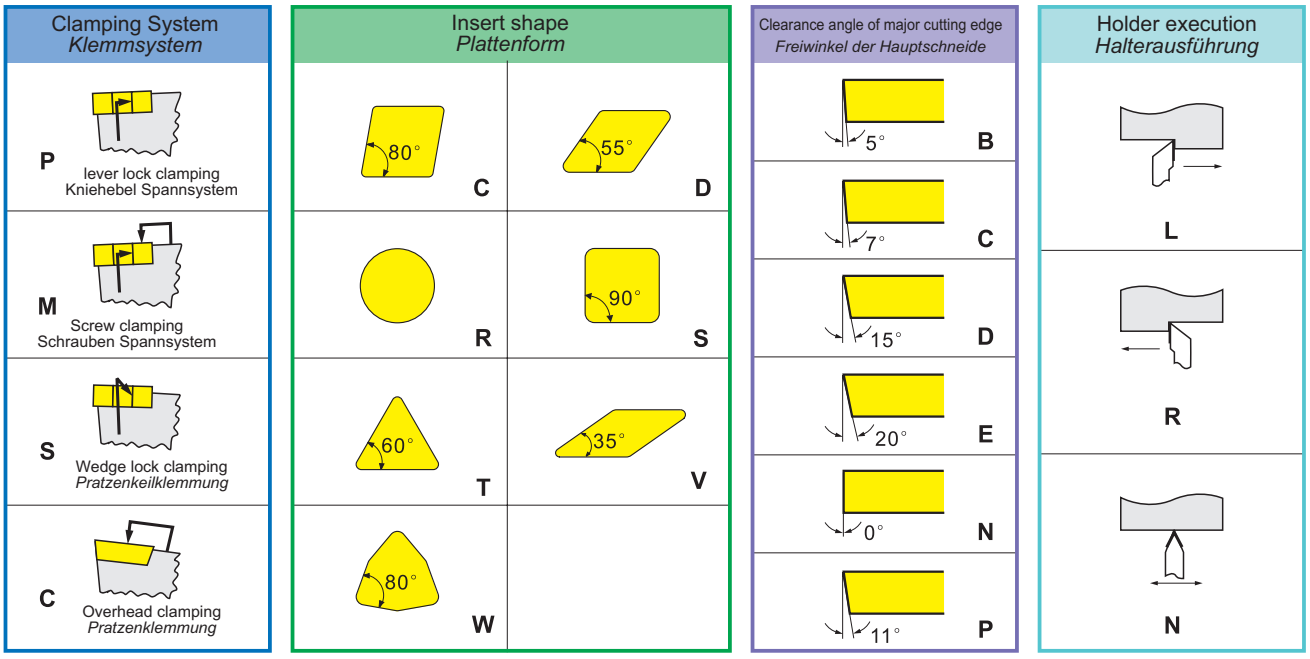
✓ Recommended · Empfehlung

Clamping system Klemmsystem	Tool Type Werkzeug Typ	Approach angle Einstellwinkel	Turning Application · Anwendung						Workpiece · Werkstück		Page · Seite
			External turning Außenbearbeit.	Facing Planbearbeit.	Ext., turning & facing · Außen, & Planbearbeit.	Profiling Profilbearbeit.	Profiling Profilbearbeit.	Profiling Profilbearbeit..	Stable Stabil	Unstable Instabil	
											
M	MWLNR/ L 	95			✓				✓		A183
	MRGNR/ L 					✓			✓		A184
	MRDNN 							✓	✓		A184
S	SCACR/ L 	90	✓						✓	✓	A185
	SCLCR/ L 	95			✓				✓	✓	A186
	SDACR/ L 	90					✓		✓	✓	A187
	SDJCR/ L 	93					✓		✓	✓	A188
	SDNCN 	63						✓	✓	✓	A189
	SVJBR/ L 	93					✓		✓	✓	A190
	SVABR/ L 	90					✓		✓	✓	A191
	SVVBN 	72.5						✓	✓	✓	A192
	SVVCN 	72.5						✓	✓	✓	A193
	SVJCR/ L 	93					✓		✓	✓	A194

✓ Recommended · Empfehlung

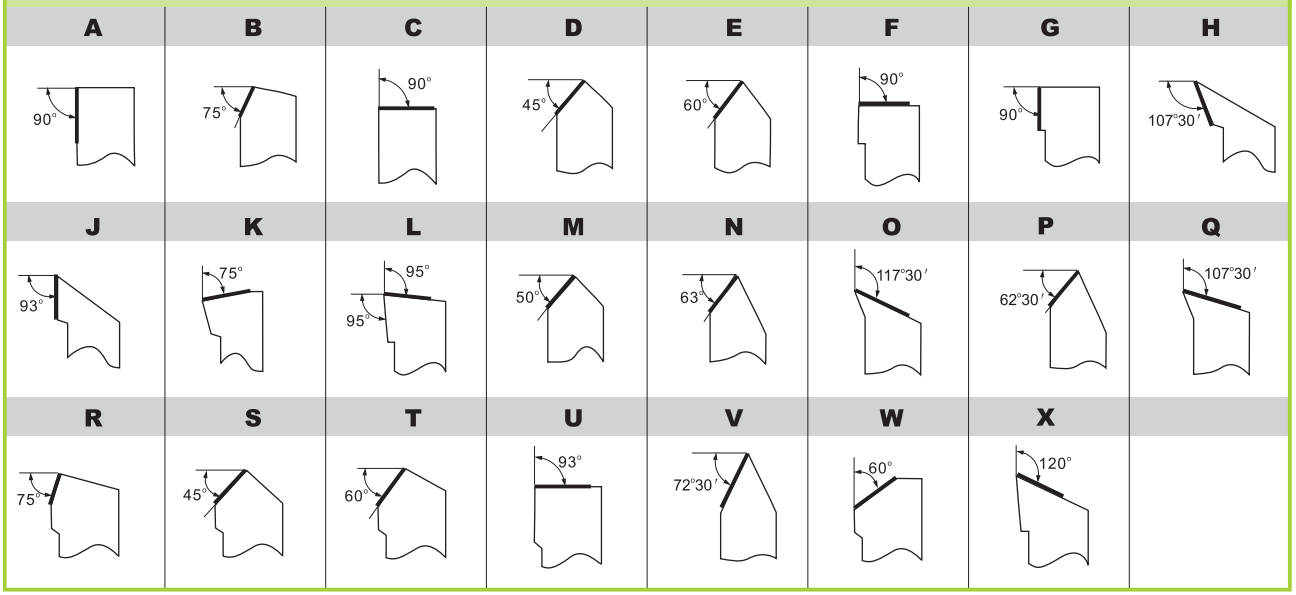
Clamping system Klemmsystem	Tool Type Werkzeug Typ	Approach angle Einstellwinkel	Turning Application · Anwendung						Workpiece · Werkstück		Page · Seite
			External turning Außenbearbeit.	Facing Planbearbeit.	Ext., turning & facing · Außen, & Planbearbeit.	Profiling Profilbearbeit.	Profiling Profilbearbeit.	Profiling Profilbearbeit..	Stable · Stabil	Unstable · Instabil	
											
S	SSBCR/ L 	75	✓						✓		A195
	SSDCN 	45						✓	✓		A195
	SSKCR/ L 	75		✓					✓		A196
	SSSCR/ L 	45	✓						✓		A196
	STACR/ L 	90	✓						✓	✓	A197
	STFCR/ L 	90		✓					✓		A197
	STGCR/ L 	91	✓						✓	✓	A198
	STTCR/ L 	60	✓						✓		A199
	SWACR/ L 	90	✓						✓	✓	A200
	SRDCN 							✓	✓		A201
	SRGCR/ L 					✓			✓		A202
C	CKJNR/ L 	93					✓		✓		A203
	CKNNR/ L 	63						✓	✓		A203

✓ Recommended · Empfehlung

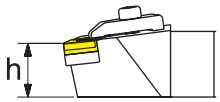




Holder style and lead angle
Halterform und Anstellwinkel

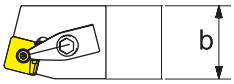


Height
Schafthöhe



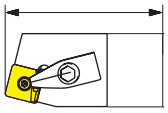
code	Height / Höhe
12	12
16	16
20	20
25	25
32	32
40	40
50	50

Shank width
Schaftbreite



code	Width / Breite
12	12
16	16
20	20
25	25
32	32
40	40
50	50

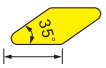
Tool length
Halterlänge



code	Length / Länge
H	100
K	125
M	150
P	170
Q	180
R	200
S	250
T	300

25 25 M 12

Cutting edge length
Schneidkantenlänge

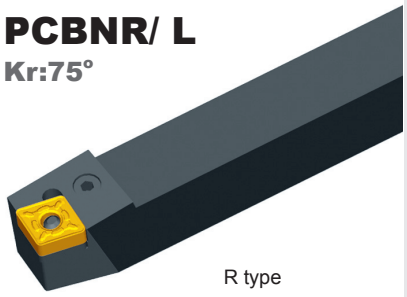
insert shape Plattenform	C	D	R	S	T	V	W
							
Diameter of incircle Durchmesser (mm)	Cutting edge length / Schneidkantenlänge						
5.556	---	---	---	---	09	---	---
6.350	06	07	---	---	11	---	---
9.525	09	11	09	09	16	16	06
12.700	12	15	12	12	22	22	08
15.875	16	19	15	15	27	---	---
19.050	19	---	19	19	33	---	---
25.400	25	---	25	25	44	---	---
32.000	---	---	32	---	---	---	---

CN** Toolholder · Halter

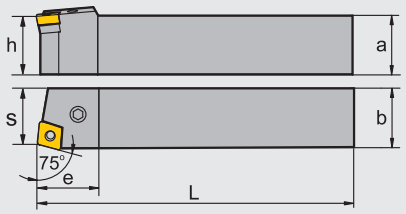
P-Clamping · P-Halter

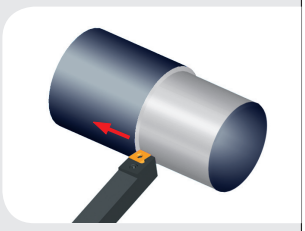
PCBNR/ L

Kr:75°



R type
Rechtsausführung





Type · Typ		Stock Lager Lager		Dimension (mm) Abmessung						Screw Schraube	Shim Unterlage	Wrench Schlüssel	Lever Kniehebel	Shim pin Rohrstift
		R	L	a	b	L	h	s	e					
PCBNR/ L	**2020K12**	●	●	20	20	125	20	17	27	LEM8×21	C12AP	WH30L	L4	SP4
	2525M12	●	●	25	25	150	25	22	27					
	3232P12	●	●	32	32	170	32	27	27					
	2525M16	●	●	25	25	150	25	22	33	LEM8×25	C16AP	WH30L	L5	SP5
	3232P16	●	●	32	32	170	32	27	33					
	3232P19	●	●	32	32	170	32	27	38	LEM10×27	C19AP	WH40L	L6	SP6
	4040S19	●	●	40	40	250	40	35	38					
	4040S2507	●	●	40	40	250	40	35	50	LEM12×36A	C25AP-07	WH50L	L8	SP8
	4040S2509	●	●	40	40	250	40	35	50		C25AP			

Applicable inserts
Wendeschneidplatten

Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	Rough machining Schruppen	Heavy Duty Schwerzerspanung	Cast iron Grauguss Bearbeit.
Inserts WSP	**DF**  A46	**PM**  A47	**DR**  A49	**HDR**  A50	 A51
	SF  A46	**DM**  A48	**DR**  A50		
	EF  A46	**EM**  A48	**ER**  A50		
	NF  A47	**NM**  A49	**ER**  A50		

Type · Typ					
PCBNR/LK / M / P12**	CN**1204**	CN**1204**	CN**1204**	CN**1204**	CN**1204**
PCBNR/LM / P16**	CN**1606**	CN**1606**	CN**1606**	CN**1606**	CN**1606**
PCBNR/LP / S19**		CN**1906**	CN**1906**	CN**1906**	CN**1906**
PCBNR/LS2507**			CN**2507**		
PCBNR/LS2509**			CN**2509**		

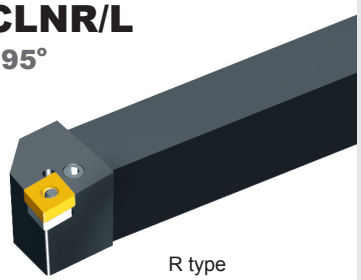
● ex stock · ab Lager ○ on demand · Anfrage

CN** Toolholder · Halter

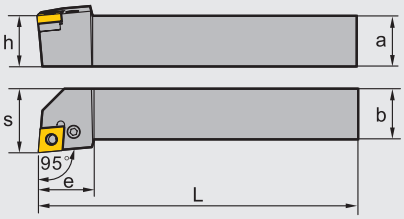
P-Clamping · P-Halter

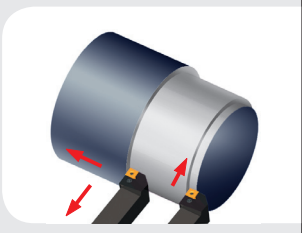
PCLNR/L

Kr:95°



R type
Rechtsausführung





Type · Typ		Stock Lager		Dimension (mm) Abmessung						Screw Schraube	Shim Unterlage	Wrench Schlüssel	Lever Kniehebel	Shim pin Rohrstift
		R	L	a	b	L	h	s	e					
PCLNR/ L	**1616H09**	●	●	16	16	100	16	20	20	LEM6×13.4A	C09AP	WH25L	L3	SP10
	2020K09	●	●	20	20	125	20	25	22					
	2525M09	●	●	25	25	150	25	32	22					
	2020K12	●	●	20	20	125	20	25	28	LEM8×21	C12AP	WH30L	L4	SP4
	2525M12	●	●	25	25	150	25	32	28					
	3232P12	●	●	32	32	170	32	40	28					
	2525M16	●	●	25	25	150	25	32	33	LEM8×25	C16AP	WH30L	L5	SP5
	3232P16	●	●	32	32	170	32	40	33					
	3232P19	●	●	32	32	170	32	40	38	LEM10×27	C19AP	WH40L	L6	SP6
	4040S19	●	●	40	40	250	40	50	38					
	4040S2507	●	●	40	40	250	40	50	49	LEM12×36A	C25AP-07	WH50L	L8	SP8
	4040S2509	●	●	40	40	250	40	50	49		C25AP			

Applicable insert
Wendeschneidplatten

Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	Roughing Schruppen	Heavy Duty Schwerzerspanung	Cast iron Grauguss Bearbeit.	PCBN · PCD PCBN · PKD
insert shape Schneidplattenform	**DF** A46	**PM** A47	**DR** A49	**HDR** A50	A51	A118
	WG A46	**DM** A48	**DR** A50			
	SF A46	**EM** A48	**ER** A50			
	EF A46	**NM** A49	**ER** A50			
	NF A47					

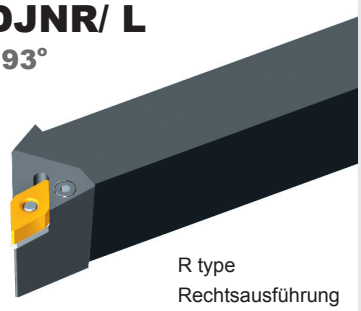
Type · Typ							
	PCLNR/LH / K / M09**	CN**0903**	CN**0903**				
	PCLNR/LK / M / P12**	CN**1204**	CN**1204**	CN**1204**	CN**1204**	CN**1204**	CN**1204**
	PCLNR/LM / P16**	CN**1606**	CN**1606**	CN**1606**	CN**1606**	CN**1606**	
	PCLNR/LP / S19**		CN**1906**	CN**1906**	CN**1906**	CN**1906**	
	PCLNR/LS2507**			CN**2507**			
	PCLNR/LS2509**			CN**2509**			

DN** Toolholder · Halter

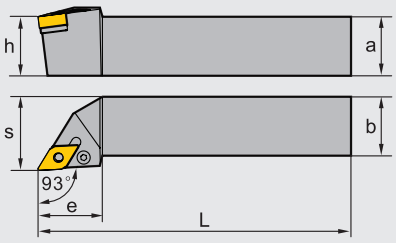
P-Clamping · P-Halter

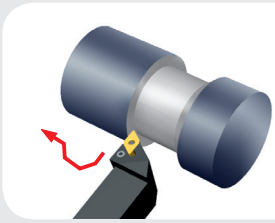
PDJNR/ L

Kr:93°



R type
Rechtsausführung





Type · Typ		Stock Lager		Dimension (mm) Abmessung						Screw Schraube	Shim Unterlage	Wrench Schlüssel	Lever Kniehebel	Shim pin Rohrstift
		R	L	a	b	L	h	s	e					
PDJNR/ L	**1616H11**	●	●	16	16	100	16	20	25	LEM6×13.4A	D11AP	WH25L	L3	SP3
	2020K11	●	●	20	20	125	20	25	25					
	2525M11	●	●	25	25	150	25	32	30					
	2020K15	●	●	20	20	125	20	25	35	LEM8×21	D15AP	WH30L	L4B	SP4
	2525M15	●	●	25	25	150	25	32	35					
	3232P15	●	●	32	32	170	32	40	35					
	2020K15-3	●	●	20	20	125	20	25	35	LEM8×21	D15AP	WH30L	L4	SP4
	2525M15-3	●	●	25	25	150	25	32	35					
	3232P15-3	●	●	32	32	170	32	40	35					

Applicable insert Wendeschneidplatten

Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	Roughing Schruppen	Heavy Duty Schwerzerspanung	Cast iron machining Grauguss Bearbeit.	PCBN · PCD PCBN · PKD
insert shape Schneidplattenform	**DF** A53	**PM** A55	**DR** Double -side A56	**HDR** A58	A58	A119
	WG A53	**DM** A55	**DR** Single- side A58			
	SF A53	**EM** A56	**ER** Double -side A58			
	EF A54	**NM** A56	**ER** Single- side A58			
	NF A54					

Type · Typ							
	PDJNR/LH / K / M11**	DN**1104**	DN**1104**			DN**1104**	
	PDJNR/LK / M / P15**	DN**1506**	DN**1506**	DN**1506**	DN**1506**	DN**1506**	DN**1506**
	PDJNR/LK / M / P15-3**	DN**1504**	DN**1504**			DN**1504**	DN**1506**

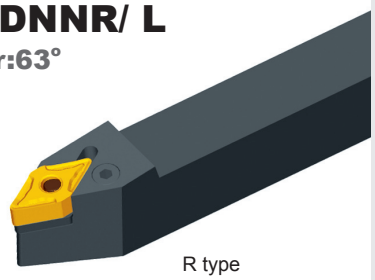
● ex stock · ab Lager ○ on demand · Anfrage

DN** Toolholder · Halter

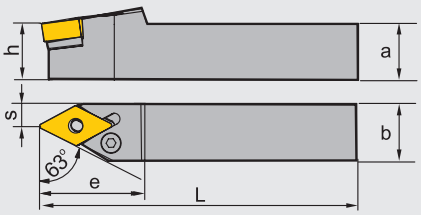
P-Clamping · P-Halter

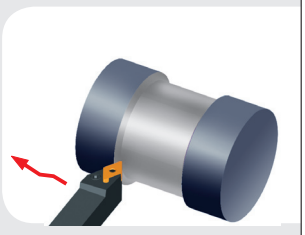
PDNNR/ L

Kr:63°



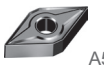
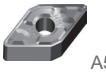
R type
Rechtsausführung





Type · Typ		Stock Lager		Dimension (mm) Abmessung						Screw Schraube	Shim Unterlage	Wrench Schlüssel	Lever Kniehebel	Shim pin Rohrstift
		R	L	a	b	L	h	s	e					
PDNNR/ L	**2020K15**	●	●	20	20	125	20	8	37	LEM8×21	D15AP	WH30L	L4B	SP4
	2525M15	●	●	25	25	150	25	12.5	37					
	3232P15	●	●	32	32	170	32	16	37					
	2020K15-3	●	●	20	20	125	20	8	37	LEM8×21	D15AP	WH30L	L4	SP4
	2525M15-3	●	●	25	25	150	25	12.5	37					
	3232P15-3	●	●	32	32	170	32	16	37					

Applicable insert Wendeschneidplatten

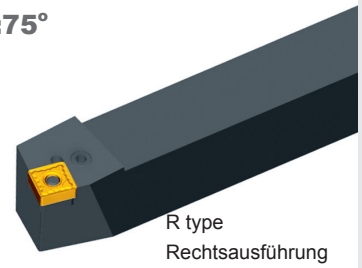
Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	Roughing Schruppen	Heavy Duty Schwerzerspanung	Cast iron machining Grauguss Bearbeit.	PCBN · PCD PCBN · PKD
insert shape Schneidplattenform	**DF**  A53	**PM**  A55	**DR** Double -side  A56	**HDR**  A58	 A58	 A119
	SF  A53	**DM**  A55	**DR** Single- side  A58			
	EF  A54	**EM**  A56	**ER** Double -side  A58			
	NF  A54	**NM**  A56	**ER** Single- side  A58			
Type · Typ **PDNNR/L**K /M/ P15**	DN**1506**	DN**1506**	DN**1506**	DN**1506**	DN**1506**	DN**1506**
PDNNR/LK / M/ P15-3**	DN**1504**	DN**1504**			DN**1504**	DN**1504**

SN** Toolholder · Halter

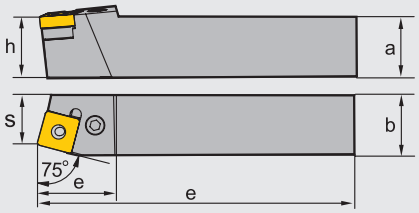
P-Clamping · P-Halter

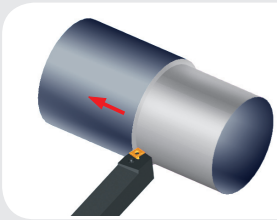
PSBNR/ L

Kr:75°



R type
Rechtsausführung





Type · Typ		Stock Lager		Dimension (mm) Abmessung						Screw Schraube	Shim Unterlage	Wrench Schlüssel	Lever Kniehebel	Shim pin Rohrstift
		R	L	a	b	L	h	s	e					
PSBNR/ L	**1616H09**	●	●	16	16	100	16	13	21	LEM6×13.4A	S09AP	WH25L	L3	SP10
	2020K09	●	●	20	20	125	20	17	23					
	2020K12	●	●	20	20	125	20	17	28	LEM8×21	S12AP	WH30L	L4	SP4
	2525M12	●	●	25	25	125	25	22	28					
	3225P12	●	●	32	25	170	32	22	28					
	3232P12	●	●	32	32	170	32	27	28					
	2525M15	●	●	25	25	150	25	22	35	LEM8×25	S15AP	WH30L	L5	SP5
	3232P15	●	●	32	32	170	32	27	35					
	3232P19	●	●	32	32	170	32	27	40	LEM10×27	S19AP	WH40L	L6	SP6
	4040S19	●	●	40	40	250	40	35	40					
	4040S2507	●	●	40	40	250	40	35	48	LEM12×36A	S25AP	WH50L	L8	SP8
	4040S2509	●	●	40	40	250	40	35	48		S25AP-09			

Applicable insert
Wendeschneidplatten

Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	Roughing Schruppen	Heavy Duty Schwerzerspanung	Cast iron machining Grauguss Bearbeit.	PCBN · PCD PCBN · PKD
insert shape Schneidplattenform	**DF** A59	**PM** A60	**DR** Double-side A62	**HDR** A64	A65	A120
	EF A59	**DM** A61	**DR** Single-side A62			
	SF A60	**EM** A61	**ER** Double-side A63			
		NM A62	**ER** Single-side A63			

Type · Typ	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	Roughing Schruppen	Heavy Duty Schwerzerspanung	Cast iron machining Grauguss Bearbeit.	PCBN · PCD PCBN · PKD
PSBNR/LH / K09**	SN**0903**	SN**0903**			SN**0903**	
PSBNR/LK / M / P12**	SN**1204**	SN**1204**	SN**1204**	SN**1204**	SN**1204**	SN**1204**
PSBNR/LM / P15**	SN**1506**	SN**1506**	SN**1506**	SN**1506**	SN**1506**	
PSBNR/LP / S19**		SN**1906**	SN**1906**	SN**1906**	SN**1906**	
PSBNR/LS2507**			SN**2507**	SN**2507**		
PSBNR/LS2509**			SN**2509**	SN**2509**		

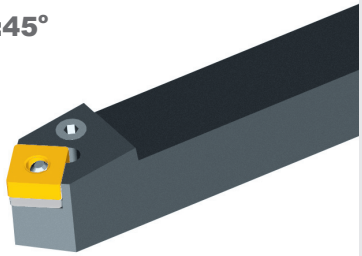
● ex stock · ab Lager ○ on demand · Anfrage

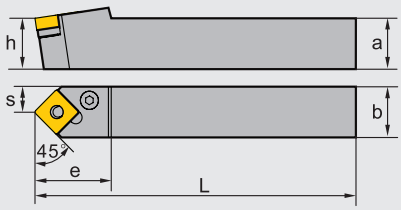
SN** Toolholder · Halter

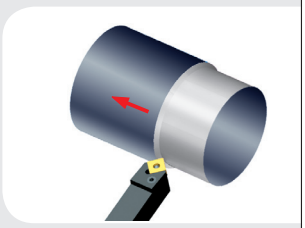
P-Clamping · P-Halter

PSDNN

Kr:45°







Type · Typ		Stock Lager	Dimension (mm) Abmessung						Screw Schraube	Shim Unterlage	Wrench Schlüssel	Lever Kniehebel	Shim pin Rohrstift
			a	b	L	h	s	e					
PSDNN	**1212F09**		12	12	80	12	6	21	LEM5×12B	—	WH20L	L3B	—
	1616H09	●	16	16	100	16	8	23	LEM6×13.4A	S09AP	WH25L	L3	SP10
	2020K12	●	20	20	125	20	10	30	LEM8×21	S12AP	WH30L	L4	SP4
	2525M12	●	20	20	150	20	12.5	30					
	3232P12	●	32	32	170	32	16	40					
	2525M15	●	25	25	150	25	12.5	40	LEM8×25	S15AP	WH30L	L5	SP5
	3232P15	●	32	32	170	32	16	40					
	3232P19	●	32	32	170	32	16	40	LEM10×27	S19AP	WH40L	L6	SP6
	4040S19	●	40	40	250	40	20	40					

Applicable insert
Wendeschneidplatten

Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	Roughing Schruppen	Heavy Duty Schwerzerspanung	Cast iron machining Grauguss Bearbeit.	PCBN · PCD PCBN · PKD
insert shape Schneidplattenform	**DF** A59	**PM** A60	**DR** Double-side A62	**HDR** A64	A65	A120
	EF A59	**DM** A61	**DR** Single-side A62			
	SF A60	**EM** A61	**ER** Double-side A63			
		NM A62	**ER** Single-side A63			

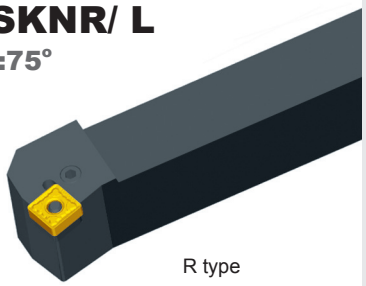
Type · Typ							
	PSDNNF / H09**	SN**0903**	SN**0903**			SN**0903**	
	PSDNNK / M / P12**	SN**1204**	SN**1204**	SN**1204**	SN**1204**	SN**1204**	SN**1204**
	PSDNNM / P15**	SN**1506**	SN**1506**	SN**1506**	SN**1506**	SN**1506**	
	PSDNNP / S19**		SN**1906**	SN**1906**	SN**1906**	SN**1906**	

SN** Toolholder · Halter

P-Clamping · P-Halter

PSKNR/ L

Kr:75°



R type
Rechtsausführung





Type · Typ		Stock Lager		Dimension (mm) Abmessung						Screw Schraube	Shim Unterlage	Wrench Schlüssel	Lever Kniehebel	Shim pin Rohrstift
		R	L	a	b	L	h	s	e					
PSKNR/ L	**1616H09**	●	●	16	16	100	16	20	17	LEM6×13.4A	S09AP	WH25L	L3	SP10
	2020K09	●	●	20	20	125	20	25	20					
	2020K12	●	●	20	20	125	20	25	26	LEM8×21	S12AP	WH30L	L4	SP4
	2525M12	●	●	25	25	150	25	32	26					
	3232P12	●	●	32	32	170	32	40	26					
	2525M15	●	●	25	25	150	25	32	32	LEM8×25	S15AP	WH30L	L5	SP5
	3232P15	●	●	32	32	170	32	40	32					
	3232P19	●	●	32	32	170	32	40	36	LEM10×27	S19AP	WH40L	L6	SP6
	4040S19	●	●	40	40	250	40	50	40					

Applicable insert
Wendeschneidplatten

Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	Roughing Schruppen	Heavy Duty Schwerzerspanung	Cast iron machining Grauguss Bearbeit.	PCBN · PCD PCBN · PKD
insert shape Schneidplattenform	**DF** A59	**PM** A60	**DR** A62	**HDR** A64	A65	A120
	EF A59	**DM** A61	**DR** A62			
	SF A60	**EM** A61	**ER** A63			
		NM A62	**ER** A63			

Type · Typ							
	PSKNR/ LH / K09**	SN**0903**	SN**0903**			SN**0903**	
	PSKNR/ LK / M / P12**	SN**1204**	SN**1204**	SN**1204**	SN**1204**	SN**1204**	SN**1204**
	PSKNR/ LM / P15**	SN**1506**	SN**1506**	SN**1506**	SN**1506**	SN**1506**	
	PSKNR/ LP / S19**		SN**1906**	SN**1906**	SN**1906**	SN**1906**	

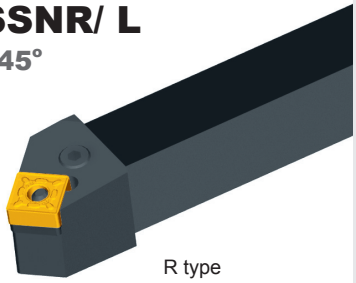
● ex stock · ab Lager ○ on demand · Anfrage

SN** Toolholder · Halter

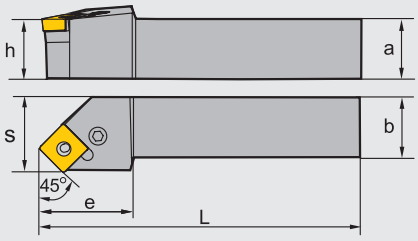
P-Clamping · P-Halter

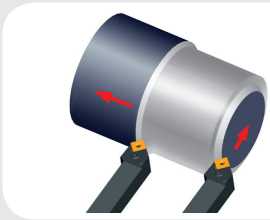
PSSNR/ L

Kr:45°



R type
Rechtsausführung





Type · Typ		Stock Lager		Dimension (mm) Abmessung						Screw Schraube	Shim Unterlage	Wrench Schlüssel	Lever Kniehebel	Shim pin Rohrstift
		R	L	a	b	L	h	s	e					
PSSNR/ L	**1616H09**	●	●	16	16	100	16	20	25	LEM6×13.4A	S09AP	WH25L	L3	SP10
	2020K12	●	●	20	20	125	20	25	30	LEM8×21	S12AP	WH30L	L4	SP4
	2525M12	●	●	25	25	150	25	32	30					
	3232P12	●	●	32	32	170	32	40	40					
	2525M15	●	●	25	25	150	25	32	30	LEM8×25	S15AP	WH30L	L5	SP5
	3232P15	●	●	32	32	170	32	40	40					
	3232P19	●	●	32	32	170	32	40	40	LEM10×27	S19AP	WH40L	L6	SP6
	4040S19	●	●	40	40	250	40	50	50					
	4040S2507	●	●	40	40	250	40	50	50	LEM12×36A	S25AP	WH50L	L8	SP8
	4040S2509	●	●	40	40	250	40	50	50		S25AP-09			

Applicable insert Wendeschneidplatten

Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	Roughing Schruppen	Heavy Duty Schwerzerspanung	Cast iron machining Grauguss Bearbeit.	PCBN · PCD PCBN · PKD
insert shape Schneidplattenform	**DF**  A59	**PM**  A60	**DR** Double-side  A62	**HDR**  A64	 A65	 A120
	EF  A59	**DM**  A61	**DR** Single-side  A62			
	SF  A60	**EM**  A61	**ER** Double-side  A63			
		NM  A62	**ER** Single-side  A63			

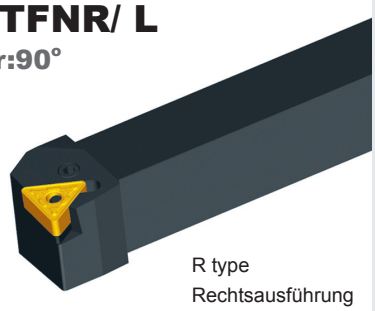
Type · Typ							
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	PSSNR/ LK / M / P12**	SN**1204**	SN**1204**	SN**1204**	SN**1204**	SN**1204**	SN**1204**
	PSSNR/ LM / P15**	SN**1506**	SN**1506**	SN**1506**	SN**1506**	SN**1506**	
	PSSNR/ LP / S19**		SN**1906**	SN**1906**	SN**1906**	SN**1906**	
	PSSNR/ LS2507**			SN**2507**	SN**2507**		
	PSSNR/ LS2509**			SN**2509**	SN**2509**		

TN** Toolholder · Halter

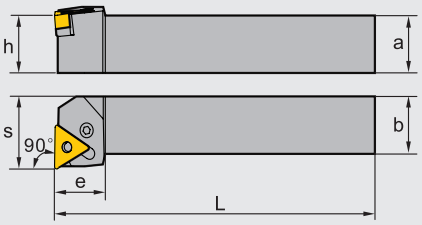
P-Clamping · P-Halter

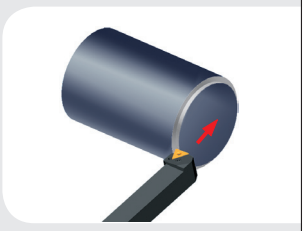
PTFNR/ L

Kr:90°



R type
Rechtsausführung





Type · Typ		Stock Lager R	Stock Lager L	Dimension (mm) Abmessung a	b	L	h	s	e	Screw Schraube	Shim Unterlage	Wrench Schlüssel	Lever Kniehebel	Shim pin Rohrstift
PTFNR/ L	**1616H16**	●	●	16	16	100	16	20	20	LEM6×13.4A	T16AP	WH25L	L3	SP3
	2020K16	●	●	20	20	125	20	25	20					
	2525M16	●	●	25	25	150	25	32	20					
	2525M22	●	●	25	25	150	25	32	25	LEM8×21	T22AP	WH30L	L4	SP4
	3232P22	●	●	32	32	170	32	40	25					
	3232P27	●	●	32	32	170	32	40	34	LEM8×25	T27AP	WH30L	L5	SP5
	4040S27	●	●	40	40	250	40	50	34					

Applicable insert
Wendeschneidplatten

Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	Roughing Schruppen	Heavy Duty Schwerzerspanung	Cast iron machining Grauguss Bearbeit.	PCBN · PCD PCBN · PKD
insert shape Schneidplattenform	**DF** A68	**PM** A69	**DR** A70	**HDR** A72	A73	A121
	WG Wiper inserts A68	**DM** A69	**DR** A71			
	SF A68	**EM** A70	**ER** A71			
	EF A68					

Typ · Typ							
	PTFNR/ LH / K / M16**	TN**1604**	TN**1604**	TN**1604**	TN**1604**	TN**1604**	TN**1604**
	PTFNR/ LM / P22**	TN**2204**	TN**2204**	TN**2204**	TN**2204**	TN**2204**	
	PTFNR/ LP / S27**			TN**2706**	TN**2706**	TN**2706**	

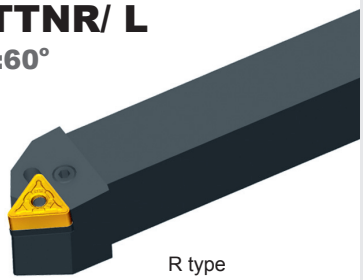
● ex stock · ab Lager ○ on demand · Anfrage

TN** Toolholder · Halter

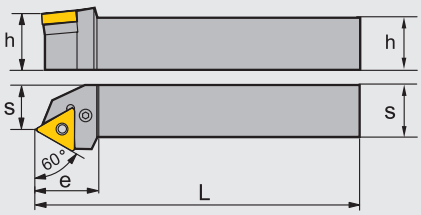
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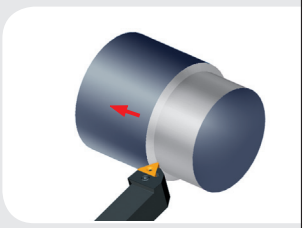
PTTNR/ L

Kr:60°



R type
Rechtsausführung





Type · Typ		Stock Lager		Dimension (mm) Abmessung						Screw Schraube	Shim Unterlage	Wrench Schlüssel	Lever Kniehebel	Shim pin Rohrstift
		R	L	a	b	L	h	s	e					
PTTNR/ L	**1616H16**	●	●	16	16	100	16	13	25	LEM6×13.4A	T16AP	WH25L	L3	SP3
	2020K16	●	●	20	20	125	20	17	25					
	2525M22	●	●	25	25	150	20	22	32	LEM8×21	T22AP	WH30L	L4	SP4

Applicable insert
Wendeschneidplatten

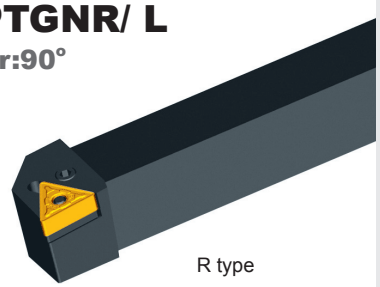
Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	Roughing Schruppen	Heavy Duty Schwerzerspanung	Cast iron machining Grauguss Bearbeit.	PCBN · PCD PCBN · PKD
insert shape Schneidplattenform	**DF**  A68	**PM**  A69	**DR**  A70	**HDR**  A72	 A73	 A121
	SF  A68	**DM**  A69	**DR**  A71			
	EF  A68	**EM**  A70	**ER**  A71			
Type Typ **PTTNR / L**H / K16**		TN**1604**	TN**1604**	TN**1604**	TN**1604**	TN**1604**	TN**1604**
Type Typ **PTTNR / L**M22**		TN**2204**	TN**2204**	TN**2204**	TN**2204**	TN**2204**	

TN** Toolholder · Halter

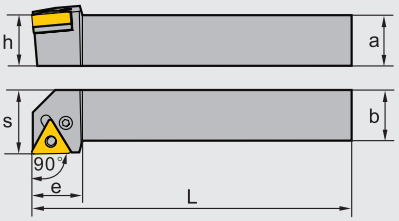
P-Clamping · P-Halter

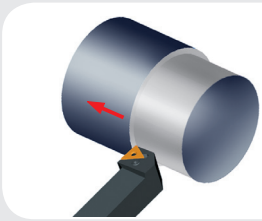
PTGNR/ L

Kr:90°



R type
Rechtsausführung





Type · Typ		Stock Lager R	Stock Lager L	a	b	L	h	s	e	Screw Schraube	Shim Unterlage	Wrench Schlüssel	Lever Kniehebel	Shim pin Rohrstift
PTGNR/ L	**1010E11**			10	10	70	10	14	16	LEM5×9B	—	WH20L	L2	—
	1212F11			12	12	80	12	16	14					
	1616H11	●	●	16	16	100	16	20	18					
	2020K11	●	●	20	20	125	20	25	19					
	2525M11	●	●	25	25	150	25	32	20					
	1616H16	●	●	16	16	100	16	20	20	LEM6×13.4A	T16AP	WH25L	L3	SP3
	2020K16	●	●	20	20	125	20	25	20					
	2525M16	●	●	25	25	150	25	32	20					
	3232P16	●	●	32	32	170	32	40	20					
	2525M22	●	●	25	25	150	25	32	28	LEM8×21	T22AP	WH30L	L4	SP4
	3232P22	●	●	32	32	170	32	40	28					
	3232P27	●	●	32	32	170	32	40	33	LEM8×25	T27AP	WH30L	L5	SP5
	4040S27	●	●	40	40	250	40	50	33					

Applicable insert Wendeschneidplatten

Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	Roughing Schruppen	Heavy Duty Schwerzerspanung	Cast iron machining Grauguss Bearbeit.	PCBN · PCD PCBN · PKD
insert shape Schneidplattenform	**DF** A68	**PM** A69	**DR** Double -side A70	**HDR** A72	Flat A73	Flat A121
	WG Wiper inserts A68	**DM** A69	**DR** A71			
	SF A68	**EM** A70	**ER** A71			
	EF A68					

Type · Typ							
	PTGNR/LE / F / H / K / M11**	TN**1103**	TN**1103**			TN**1103**	
	PTGNR/LH / K / M16**	TN**1604**	TN**1604**	TN**1604**	TN**1604**	TN**1604**	TN**1604**
	PTGNR /LM / P22**	TN**2204**	TN**2204**	TN**2204**	TN**2204**	TN**2204**	
	PTGNR/LP / S27**			TN**2706**	TN**2706**	TN**2706**	

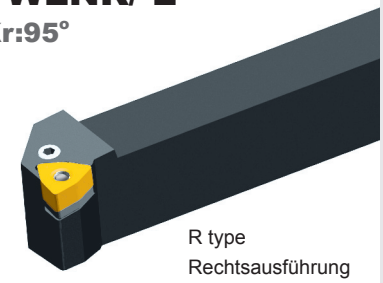
● ex stock · ab Lager ○ on demand · Anfrage

WN** Toolholder · Halter

P-Clamping · P-Halter

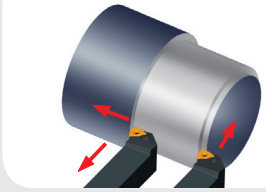
PWLNR/ L

Kr:95°



R type
Rechtsausführung





Type · Typ		Stock Lager		Dimension (mm) Abmessung						Screw Schraube	Shim Unterlage	Wrench Schlüssel	Lever Kniehebel	Shim pin Rohrstift
		R	L	a	b	L	h	s	e					
PWLNR/ L	**1616H06**	●	●	16	16	100	16	20	20	LEM6×13.4A	W06AP	WH25L	L3	SP3
	2020K06	●	●	20	20	125	20	25	20					
	2525M06	●	●	25	25	150	25	32	20					
	2020K08	●	●	20	20	125	20	25	26	LEM8×21	W08AP	WH30L	L4	SP4
	2525M08	●	●	25	25	150	25	32	26					

Applicable insert Wendeschneidplatten

Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	Roughing Schruppen	Cast iron machining Grauguss Bearbeit.
insert shape Schneidplattenform	**DF** A76	**PM** A78	**DR** Double -side A79	Flat A79
	WG Wiper inserts A76	**DM** A78		
	SF A77	**EM** A78		
	EF A77	**NM** A79		
	NF A77			

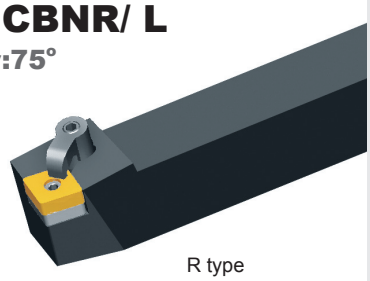
Type · Typ					
	PWLNR/ LH / K / M06**	WN**0604**	WN**0604**	WN**0604**	WN**0604**
	PWLNR/ LK / M08**	WN**0804**	WN**0804**	WN**0804**	WN**0804**

CN** Toolholder · Halter

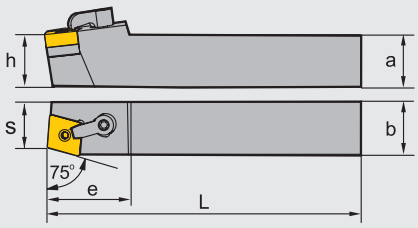
M-Clamping · M-Halter

MCBNR/ L

Kr:75°



R type
Rechtsausführung





Type · Typ		Stock Lager R	Stock Lager L	Dimension (mm) Abmessung a	b	L	h	s	e	Clamping screw Schraube	Shim Unterlage	Wrench Schlüssel	Clamp Pratze	Clamping stud Passstift
MCBNR/ L	**2020K12**	●	○	20	20	125	20	17	32	DM6×25	C12BM	WH30L	C1RD	TM6×17
	2525M12	●	●	20	20	150	20	22	32	DM6×30				
	3225P12	●	●	32	25	170	32	22	32					
	2525M16	○	○	25	25	150	25	22	40	DM6×30	C16BM	WH30L	C2RD	TM8×21
	3232P16	●	●	32	32	170	32	27	40					
	3232P19	○	○	32	32	170	32	27	45	DM8×30X	C19BM	WH40L	C5RD	TM10×21
	4040R19	○	○	40	40	200	40	35	45					

Applicable insert Wendeschneidplatten

Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	Roughing Schruppen	Heavy Duty Schwerzerspanung	Cast iron machining Grauguss Bearbeit.
insert shape Schneidplattenform	**DF** A46	**PM** A47	**DR** A49	**HDR** A50	Flat A51
	SF A46	**DM** A48	**DR** A50		
	EF A46	**EM** A48	**ER** A50		
	NF A47	**NM** A49	**ER** A50		

Type · Typ						
	MCBNR/ LK / M / P12**	CN**1204**	CN**1204**	CN**1204**	CN**1204**	CN**1204**
	MCBNR/ LM / P16**	CN**1604**	CN**1606**	CN**1606**	CN**1606**	CN**1606**
	MCBNR/ LP / R19**		CN**1906**	CN**1906**	CN**1906**	CN**1906**

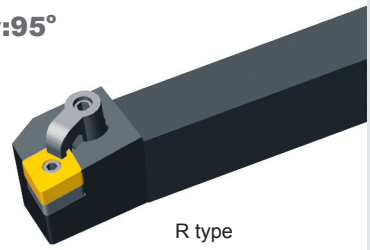
● ex stock · ab Lager ○ on demand · Anfrage

CN** Toolholder · Halter

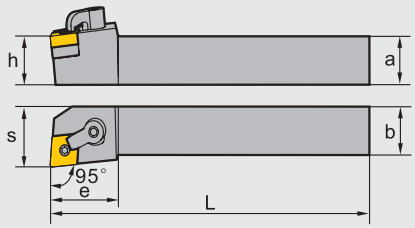
M-Clamping · M-Halter

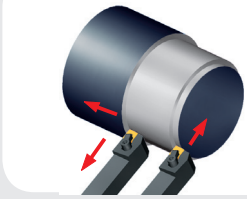
MCLNR/ L

Kr:95°



R type
Rechtsausführung





Type · Typ		Stock Lager		Dimension (mm) Abmessung						Clamping screw Schraube	Shim Unterlage	Wrench Schlüssel	Clamp Pratze	Clamping stud Passstift
		R	L	a	b	L	h	s	e					
MCLNR/ L	**2020K12**	●	●	20	20	125	20	25	32	DM6×25	C12BM	WH30L	C1RD	TM6×17
	2525M12	●	●	25	25	150	25	32	32	DM6×30				
	3225P12	●	●	32	25	170	32	32	32					
	2525M16	●	●	25	25	150	25	32	38	DM6×30	C16BM	WH30L	C2RD	TM8×21
	3232P16	●	●	32	32	170	32	40	38					
	3232P19	●	●	32	32	170	32	40	45	DM8×30X	C19BM	WH40L	C5RD	TM10×21
	4040R19	○	○	40	40	200	40	50	45					

Applicable insert
Wendeschneidplatten

Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	Roughing Schruppen	Heavy Duty Schwerzerspanung	Cast iron machining Grauguss Bearbeit.	PCBN · PCD PCBN · PKD
insert shape Schneidplattenform	**DF**  A46	**PM**  A47	**DR**  A49	**HDR**  A50	Flat  A51	Flat  A118
	WG  A46	**DM**  A48	**DR**  A50			
	SF  A46	**EM**  A48	**ER**  A50			
	EF  A46	**NM**  A49	**ER**  A50			
	NF  A47					

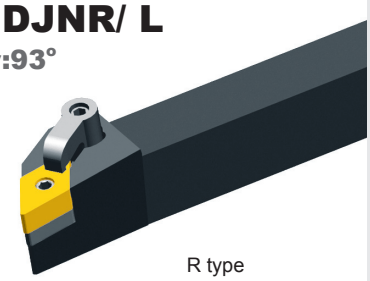
Type · Typ							
	MCLNR/ LK / M / P12**	CN**1204**	CN**1204**	CN**1204**	CN**1204**	CN**1204**	CN**1204**
	MCLNR/ LM / P16**	CN**1604**	CN**1606**	CN**1606**	CN**1606**	CN**1606**	
	MCLNR/ LP / R19**		CN**1906**	CN**1906**	CN**1906**	CN**1906**	

DN** Toolholder · Halter

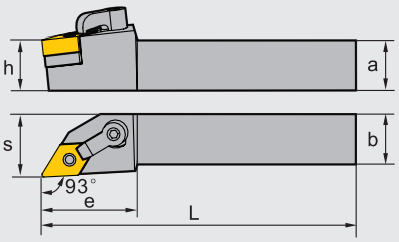
M-Clamping · M-Halter

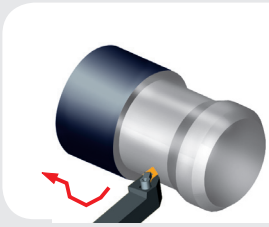
MDJNR/ L

Kr:93°



R type
Rechtsausführung





Type · Typ		Stock Lager		Dimension (mm) Abmessung						Clamping screw Schraube	Shim Unterlage	Wrench Schlüssel	Clamp Pratze	Clamping stud Passstift
		R	L	a	b	L	h	s	e					
MDJNR/ L	**2020K11**	●	●	20	20	125	20	25	32	DM6×25	D11BM	WH20L WH30L	C1RD	TM5×13
	2525M11	●	●	25	25	150	25	32	32	DM6×30				
	3225P11	●	○	32	25	170	32	32	32					
	2020K15	●	●	20	20	125	20	25	38	DM6×25	D15BM	WH30L	C2RD	TM6×19
	2525M15	●	●	25	25	150	25	32	38	DM6×30				
	3225P15	●	●	32	25	170	32	32	38					

Applicable insert
Wendeschneidplatten

Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	Roughing Schruppen	Heavy Duty Schwerzerspanung	Cast iron machining Grauguss Bearbeit.	PCBN · PCD PCBN · PKD
insert shape Schneidplattenform	**DF**  A53	**PM**  A55	**DR** Double -side  A56	**HDR**  A58	 A58	 A119
	WG  Wiper A53	**DM**  A55	**DR** Single- side  A58			
	SF  A53	**EM**  A56	**ER** Double -side  A58			
	EF  A54	**NM**  A56	**ER** Single- side  A58			
	NF  A54					
Type · Typ **MDJNR / L**K / M / P11**	DN**1104**	DN**1104**			DN**1104**	
MDJNR/ LK / M / P15**	DN**1506**	DN**1506**	DN**1506**	DN**1506**	DN**1506**	DN**1506**

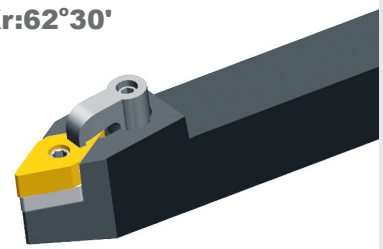
● ex stock · ab Lager ○ on demand · Anfrage

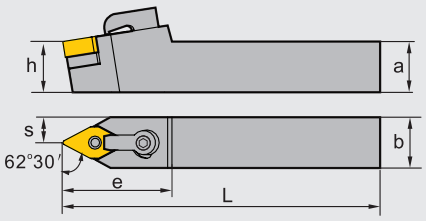
DN** Toolholder · Halter

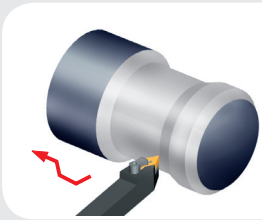
M-Clamping · M-Halter

MDPNN

Kr:62°30'







Type · Typ		Stock Lager	Dimension (mm) Abmessung						Clamping screw Schraube	Shim Unterlage	Wrench Schlüssel	Clamp Pratze	Clamping stud Passstift
			a	b	L	h	s	e					
MDPNN	**2020K11**	●	20	20	125	20	10	35	DM6×25	D11BM	WH20L WH30L	C1RD	TM5×13
	2525M11	●	25	25	150	25	12.5	35	DM6×30				
	3225P11	●	32	25	170	32	12.5	35					
	2020K15	●	20	20	125	20	10	40	DM6×25	D15BM	WH30L	C2RD	TM6×19
	2525M15	●	25	25	150	25	12.5	40	DM6×30				
	3225P15	●	32	25	170	32	12.5	40					

Applicable insert Wendeschneidplatten

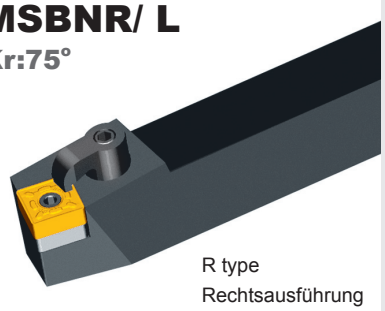
Application Anwendung		Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	Roughing Schruppen	Heavy Duty Schwerzerspanung	Cast iron machining Grauguss Bearbeit.	PCBN · PCD PCBN · PKD
insert shape Schneidplattenform		**DF** A53	**PM** A55	**DR** Double -side A56	**HDR** A58	Flat A58	Flat A119
		SF A53	**DM** A55	**DR** Single- side A58			
		EF A54	**EM** A56	**ER** Double -side A58			
		NF A54	**NM** A56	**ER** Single- side A58			
Type · Typ	**MDPNN**K / M / P11**	DN**1104**	DN**1104**				
	MDPNNK / M / P15**	DN**1506**	DN**1506**	DN**1506**	DN**1506**	DN**1506**	DN**1506**

SN** Toolholder · Halter

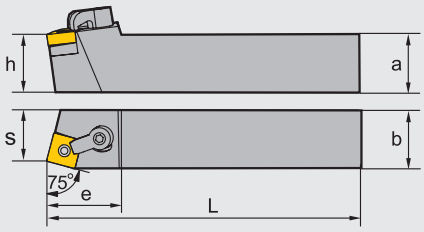
M-Clamping · M-Halter

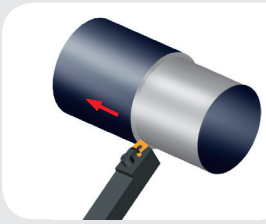
MSBNR/ L

Kr:75°



R type
Rechtsausführung





Type · Typ		Stock Lager		Dimension (mm) Abmessung						Clamping screw Schraube	Shim Unterlage	Wrench Schlüssel	Clamp Pratze	Clamping stud Passstift
		R	L	a	b	L	h	s	e					
MSBNR/ L	**2020K12**	●	●	20	20	125	20	17	32	DM6×25	S12BM	WH30L	C1RD	TM6×17
	2525M12	●	○	25	25	150	25	22	32	DM6×30				
	3225P12	●	○	32	25	170	32	22	32					
	2525M15	●	○	25	25	150	25	22	38	DM6×30	S15BM	WH30L	C2RD	TM8×21
	3232P15	●	○	32	32	170	32	29	38					
	4032R15	●	○	40	32	200	40	27	38					
	3232P19	○	○	32	32	170	32	27	45	DM8×30X	S19BM	WH40L	C5RD	TM10×21
	4040R19	●	○	40	40	200	40	35	45					
	4040R25	●	○	40	40	200	40	35	50	DM10×35X	S25BM	WH40L	C6RD	TM12×29
	4040S2509	○	○	40	40	250	40	35	50			WH40L WH50L		

Applicable insert
Wendeschneidplatten

Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	Roughing Schruppen	Heavy Duty Schwerzerspanung	Cast iron machining Grauguss Bearbeit.	PCBN · PCD PCBN · PKD
insert shape Schneidplattenform	**DF**  A59	**PM**  A60	**DR** Double-side  A62	**HDR**  A64	Flat  A65	Flat  A120
	EF  A59	**DM**  A61	**DR** Single-side  A62			
	SF  A60	**EM**  A61	**ER** Double-side  A63			
		NM  A62	**ER** Single-side  A63			

Type · Typ							
	MSBNR / LK / M / P12**	SN**1204**	SN**1204**	SN**1204**	SN**1204**	SN**1204**	SN**1204**
	MSBNR / LM / P / R15**	SN**1506**	SN**1506**	SN**1506**	SN**1506**	SN**1506**	
	MSBNR / LP / R19**		SN**1906**	SN**1906**	SN**1906**	SN**1906**	
	MSBNR / LR / S2509**			SN**2509**	SN**2509**		

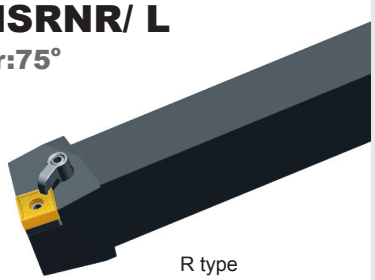
● ex stock · ab Lager ○ on demand · Anfrage

SN** Toolholder · Halter

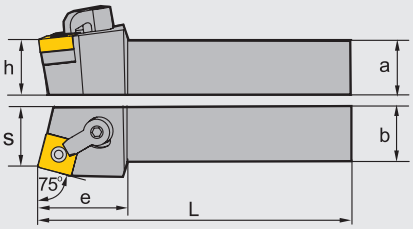
M-Clamping · M-Halter

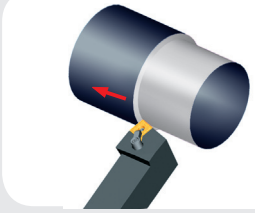
MSRNR/ L

Kr:75°



R type
Rechtsausführung





Type · Typ		Stock Lager		Dimension (mm) Abmessung						Clamping screw Schraube	Shim Unterlage	Wrench Schlüssel	Clamp Pratze	Clamping stud Passstift
		R	L	a	b	L	h	s	e					
MSRNR/ L	**2020K12**	●	○	20	20	125	20	22	36	DM6×25	S12BM	WH30L	C1RD	TM6×17
	2525M12	●	○	25	25	150	25	27	36	DM6×30				
	3225P12	●	○	32	25	170	32	27	36					
	2525M15	●	○	25	25	150	25	27	40	DM6×30	S15BM	WH30L	C2RD	TM8×21
	3232P15	●	○	32	32	170	32	35	40					
	4032R15	○	○	40	32	200	40	35	40					
	3232P19	●	○	32	32	170	32	35	45	DM8×30X	S19BM	WH40L	C5RD	TM10×21
	4040R19	○		40	40	200	40	43	45					
	4040R2509	○	○	40	40	200	40	43	50	DM10×35X	S25BM	WH40L WH50L	C6RD	TM12×29
	4040S2509	○	○	40	40	250	40	43	50					

Applicable insert Wendeschneidplatten

Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	Roughing Schruppen	Heavy Duty Schwerzerspanung	Cast iron machining Grauguss Bearbeit.	PCBN · PCD PCBN · PKD
insert shape Schneidplattenform	**DF**  A59	**PM**  A60	**DR** Double-side  A62	**HDR**  A64	Flat  A65	Flat  A120
	EF  A59	**DM**  A61	**DR** Single-side  A62			
	SF  A60	**EM**  A61	**ER** Double-side  A63			
		NM  A62	**ER** Single-side  A63			

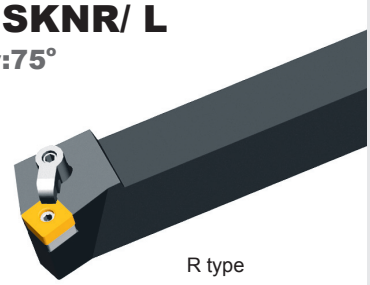
Type · Typ							
	MSRNR / LK / M / P12**	SN**1204**	SN**1204**	SN**1204**	SN**1204**	SN**1204**	SN**1204**
	MSRNR / LM / P / R15**	SN**1506**	SN**1506**	SN**1506**	SN**1506**	SN**1506**	
	MSRNR / LP / R19**		SN**1906**	SN**1906**	SN**1906**	SN**1906**	
	MSRNR / LR / S2509**			SN**2509**	SN**2509**		

SN** Toolholder · Halter

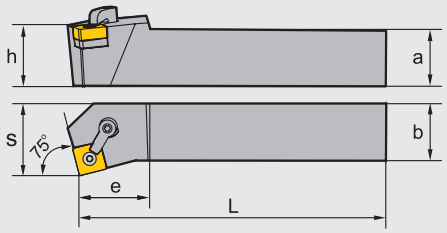
M-Clamping · M-Halter

MSKNR/ L

Kr:75°



R type
Rechtsausführung





Type · Typ		Stock Lager		Dimension (mm) Abmessung						Clamping screw Schraube	Shim Unterlage	Wrench Schlüssel	Clamp Pratze	Clamping stud Passstift
		R	L	a	b	L	h	s	e					
MSKNR/ L	**2020K12**	●	●	20	20	125	20	25	32	DM6×25	S12BM	WH30L	C1RD	TM6×17
	2525M12	●	○	25	25	150	25	32	32	DM6×30				
	3225P12	●	○	32	25	170	32	32	32					
	2525M15	●	○	25	25	150	25	32	28	DM6×30	S15BM	WH30L	C2RD	TM8×21
	3232P15	●	○	32	32	170	32	40	38					
	4032R15	○	○	40	32	200	40	40	38					
	3232P19	●	○	32	32	170	32	40	45	DM8×30X	S19BM	WH40L	C5RD	TM10×21
	4040R19	○	○	40	40	200	40	50	45					
	4040S2509	○	○	40	40	250	40	50	50	DM10×35X	S25BM	WH40L WH50L	C6RD	TM12×29

Applicable insert Wendeschneidplatten

Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	Roughing Schruppen	Heavy Duty Schwerzerspanung	Cast iron machining Grauguss Bearbeit.	PCBN · PCD PCBN · PKD
insert shape Schneidplattenform	**DF**  A59	**PM**  A60	**DR** Double -side  A62	**HDR**  A64	Flat  A65	Flat  A120
	EF  A59	**DM**  A61	**DR** Single- side  A62			
	SF  A60	**EM**  A61	**ER** Double -side  A63			
		NM  A62	**ER** Single- side  A63			

Type · Typ						
	MSKNR / LK / M / P12**	SN**1204**	SN**1204**	SN**1204**	SN**1204**	SN**1204**	SN**1204**
	MSKNR / LM / P / R15**	SN**1506**	SN**1506**	SN**1506**	SN**1506**	SN**1506**	
	MSKNR / LP / R19**		SN**1906**	SN**1906**	SN**1906**	SN**1906**	
	MSKNR / LS2509**			SN**2509**	SN**2509**		

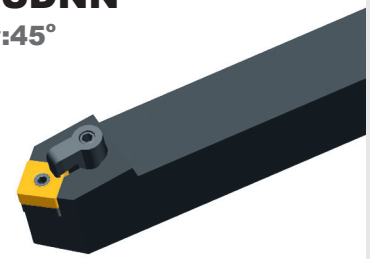
● ex stock · ab Lager ○ on demand · Anfrage

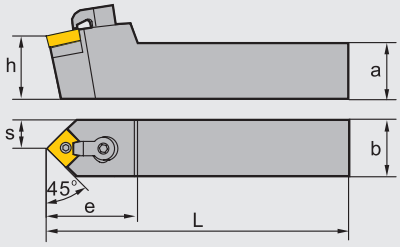
SN** Toolholder · Halter

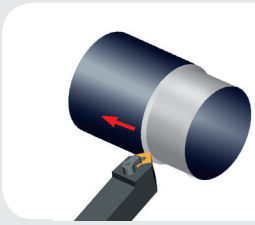
M-Clamping · M-Halter

MSDNN

Kr:45°







Type · Typ		Stock Lager	Dimension (mm) Abmessung						Clamping screw Schraube	Shim Unterlage	Wrench Schlüssel	Clamp Pratze	Clamping stud Passstift
			a	b	L	h	s	e					
MSDNN	**2020K12**	●	20	20	125	20	10	35	DM6×25	S12BM	WH30L	C1RD	TM6×17
	2525M12	●	25	25	150	25	12.5	35	DM6×30				
	3225P12	●	32	25	170	32	12.5	35					
	2525M15	●	25	25	150	25	12.5	42	DM6×30	S15BM	WH30L	C2RD	TM8×21
	3232P15	○	32	32	170	32	16	42					
	4032R15	○	40	32	200	40	16	42					

Applicable insert Wendeschneidplatten

Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	Roughing Schruppen	Heavy Duty Schwerzerspanung	Cast iron machining Grauguss Bearbeit.	PCBN · PCD PCBN · PKD
insert shape Schneidplattenform	**DF**  A59	**PM**  A60	**DR** Double -side  A62	**HDR**  A64	Flat  A65	Flat  A120
	EF  A59	**DM**  A61	**DR** Single- side  A62			
	SF  A60	**EM**  A61	**ER** Double -side  A63			
		NM  A62	**ER** Single- side  A63			

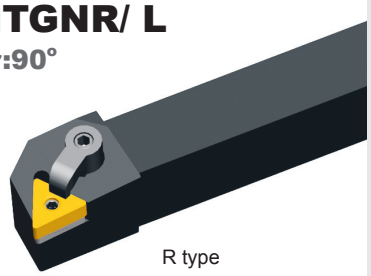
Type · Typ						
	MSDNNK · M · P12**	SN**1204**	SN**1204**	SN**1204**	SN**1204**	SN**1204**	SN**1204**
	MSDNNM · P · R15**	SN**1506**	SN**1506**	SN**1506**	SN**1506**	SN**1506**	

TN** Toolholder · Halter

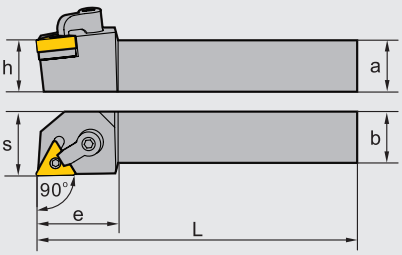
M-Clamping · M-Halter

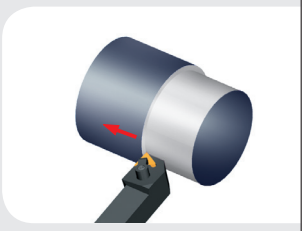
MTGNR/ L

Kr:90°



R type
Rechtsausführung





Type · Typ		Stock Lager		Dimension (mm) Abmessung						Clamping screw Schraube	Shim Unterlage	Wrench Schlüssel	Clamp Pratze	Clamping stud Passstift
		R	L	a	b	L	h	s	e					
MTGNR/ L	**2020K16**	●	○	20	20	125	20	25	33	DM6×25	T16BM	WH20L WH30L	C1RD	TM5×13
	2525M16	●	●	25	25	150	25	32	33	DM6×30				
	3225P16	●	○	32	25	170	32	32	33					
	2525M22	●	○	25	25	150	25	32	35	DM6×30	T22BM	WH30L	C2RD	TM6×17
	3225P22	●	○	32	25	170	32	32	35					

Applicable insert
Wendeschneidplatten

Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	Roughing Schruppen	Heavy Duty Schwerzerspanung	Cast iron machining Grauguss Bearbeit.	PCBN · PCD PCBN · PKD
insert shape Schneidplattenform	**DF**  A68	**PM**  A69	**DR** Double-side  A70	**HDR**  A72	Flat  A73	Flat  A121
	WG Wiper  A68	**DM**  A69	**DR** Single-side  A71			
	SF  A68	**EM**  A70	**ER** Double-side  A71			
	EF  A68					
Type · Typ **MTGNR / L** K / M / P16**	TN**1604**	TN**1604**	TN**1604**	TN**1604**	TN**1604**	TN**1604**
Type · Typ **MTGNR / L**M / P22**	TN**2204**	TN**2204**	TN**2204**	TN**2204**	TN**2204**	

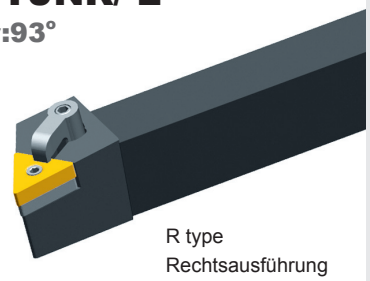
● ex stock · ab Lager ○ on demand · Anfrage

TN** Toolholder · Halter

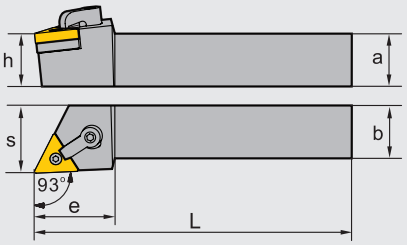
M-Clamping · M-Halter

MTJNR/ L

Kr:93°



R type
Rechtsausführung





Type · Typ		Stock Lager		Dimension (mm) Abmessung						Clamping screw Schraube	Shim Unterlage	Wrench Schlüssel	Clamp Pratze	Clamping stud Passstift
		R	L	a	b	L	h	s	e					
MTJNR/ L	**2020K16**	●	●	20	20	125	20	25	32	DM6×25	T16BM	WH20L WH30L	C1RD	TM5×13
	2525M16	●	●	25	25	150	25	32	32	DM6×30				
	3225P16	●	●	32	25	170	32	32	32					
	2525M22	●	●	25	25	150	25	32	36	DM6×30	T22BM	WH30L	C2RD	TM6×17
	3225P22	○	○	32	25	170	32	32	36					

Applicable insert Wendeschneidplatten

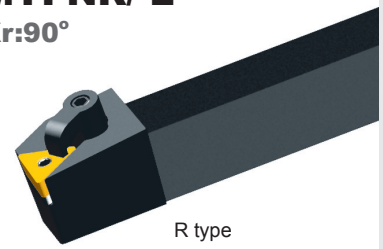
Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	Roughing Schruppen	Heavy Duty Schwerzerspanung	Cast iron machining Grauguss Bearbeit.	PCBN · PCD PCBN · PKD
insert shape Schneidplattenform	**DF**  A68	**PM**  A69	**DR** Double-side  A70	**HDR**  A72	Flat  A73	Flat  A121
	WG  A68	**DM**  A69	**DR** Single-side  A71			
	SF  A68	**EM**  A70	**ER** Double-side  A71			
	EF  A68					
Type · Typ **MTJNR / L** K / M / P16**	TN**1604**	TN**1604**	TN**1604**	TN**1604**	TN**1604**	TN**1604**
MTJNR / LM / P22**	TN**2204**	TN**2204**	TN**2204**	TN**2204**	TN**2204**	

TN** Toolholder · Halter

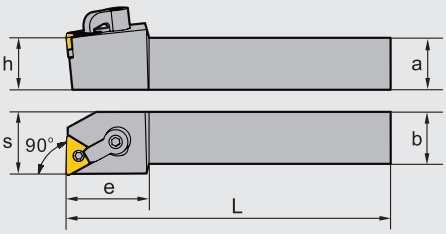
M-Clamping · M-Halter

MTFNR/ L

Kr:90°



R type
Rechtsausführung





Type · Typ		Stock Lager		Dimension (mm) Abmessung						Clamping screw Schraube	Shim Unterlage	Wrench Schlüssel	Clamp Pratze	Clamping stud Passstift
		R	L	a	b	L	h	s	e					
MTFNR/ L	**2020K16**	●	●	20	20	125	20	25	32	DM6×25	T16BM	WH20L WH30L	C1RD	TM5×13
	2525M16	●	○	25	25	150	25	32	32	DM6×30				
	3225P16	●	○	32	25	170	32	32	32					
	2525M22	●	○	25	25	150	25	32	36	DM6×30	T22BM	WH30L	C2RD	TM6×17
	3225P22	●	○	32	25	170	32	32	36					

Applicable insert
Wendeschneidplatten

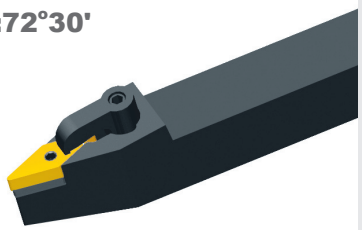
Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	Roughing Schruppen	Heavy Duty Schwerzerspanung	Cast iron machining Grauguss Bearbeit.	PCBN · PCD PCBN · PKD
insert shape Schneidplattenform	**DF**  A68	**PM**  A69	**DR** Double -side  A70	**HDR**  A72	Flat  A73	Flat  A121
	WG Wiper  A68	**DM**  A69	**DR** Single- side  A71			
	SF  A68	**EM**  A70	**ER** Double -side  A71			
	EF  A68					
Type · Typ **MTFNR / L** K / M / P16**	TN**1604**	TN**1604**	TN**1604**	TN**1604**	TN**1604**	TN**1604**
MTFNR / LM / P22**	TN**2204**	TN**2204**	TN**2204**	TN**2204**	TN**2204**	

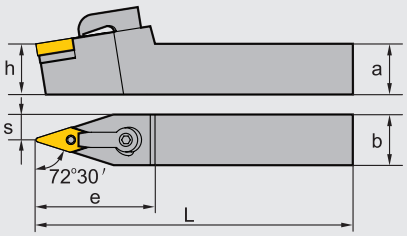
● ex stock · ab Lager ○ on demand · Anfrage

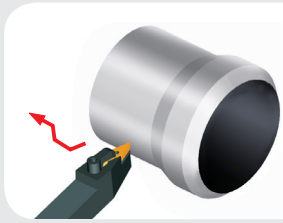
VN** Toolholder · Halter

M-Clamping · M-Halter

MVVNN
Kr:72°30'







Type · Typ		Stock Lager	Dimension (mm) Abmessung						Clamping screw Schraube	Shim Unterlage	Wrench Schlüssel	Clamp Pratze	Clamping stud Passstift
			a	b	L	h	s	e					
MVVNN	**2020K16**	●	20	20	125	20	10	45	DM6×25	V16BM	WH20L WH30L	C3RD	TM5×13
	2525M16	●	25	25	150	25	12.5	45	DM6×30				
	3225P16	○	32	25	170	32	12.5	45					
	3232P16	○	32	32	170	32	16	45					

Applicable insert
Wendeschneidplatten

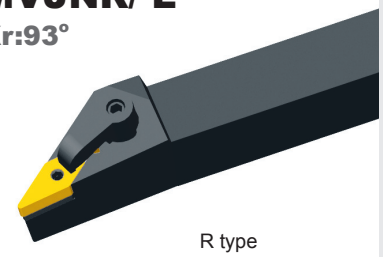
Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	PCBN · PCD PCBN · PKD
insert shape Schneidplattenform	**DF** A74	**PM** A75	Flat A122
	EF A74	**DM** A75	
	SF A74	**EM** A75	
	NF A74	**NM** A75	
Type · Typ **MVVNN** K / M / P16**	VN**1604**	VN**1604**	VN**1604**

VN** Toolholder · Halter

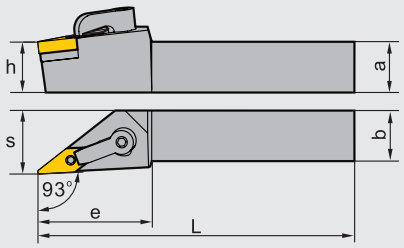
M-Clamping · M-Halter

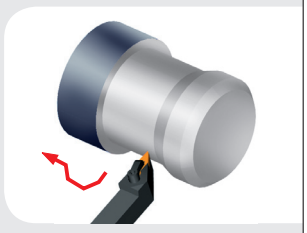
MVJNR/ L

Kr:93°



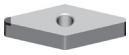
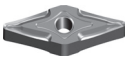
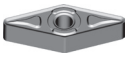
R type
Rechtsausführung





Type · Typ		Stock Lager		Dimension (mm) Abmessung						Clamping screw Schraube	Shim Unterlage	Wrench Schlüssel	Clamp Pratze	Clamping stud Passstift
		R	L	a	b	L	h	s	e					
MVJNR/ L	**2020K16**	●	●	20	20	125	20	25	45	DM6×25	V16BM	WH20L WH30L	C3RD	TM5×13
	2525M16	●	●	25	25	150	25	32	45	DM6×30				
	3225P16	○	○	32	25	170	32	32	45					
	3232P16	○	●	32	32	170	32	40	45					

Applicable insert
Wendeschneidplatten

Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	PCBN · PCD PCBN · PKD
insert shape Schneidplattenform	**DF**  A74	**PM**  A75	Flat  A122
	EF  A74	**DM**  A75	
	SF  A74	**EM**  A75	
	NF  A74	**NM**  A75	
Type · Typ **MVJNR / L** ** **K / M / P16**	VN**1604**	VN**1604**	VN**1604**

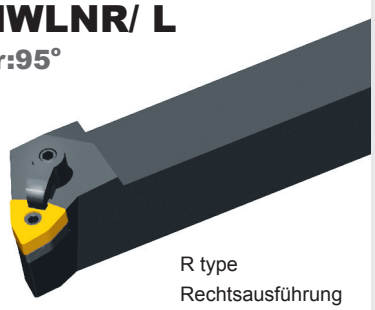
● ex stock · ab Lager ○ on demand · Anfrage

WN** Toolholder · Halter

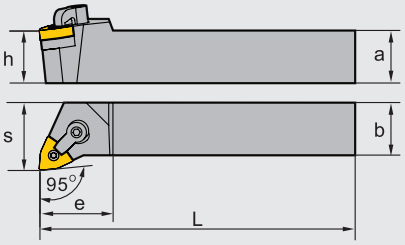
M-Clamping · M-Halter

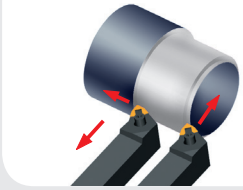
MWLNR/ L

Kr:95°



R type
Rechtsausführung





Type · Typ		Stock Lager		Dimension (mm) Abmessung						Clamping screw Schraube	Shim Unterlage	Wrench Schlüssel	Clamp Pratze	Clamping stud Passstift
		R	L	a	b	L	h	s	e					
MWLNR/ L	**2020K06**	●	●	20	20	125	20	25	30	DM6×25	W06BM	WH20L WH30L	C1RD	TM5×13
	2525M06	●	●	25	25	150	25	32	30	DM6×30				
	2020K08	●	●	20	20	125	20	25	30	DM6×25	W08BM	WH30L	C1RD	TM6×17
	2525M08	●	●	25	25	150	25	32	35	DM6×30				
	3525P08	○	○	32	25	170	32	32	35					
	3232P08	●	●	32	32	170	32	40	35					

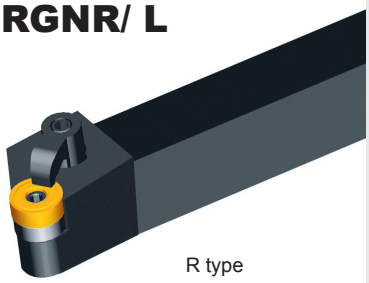
Applicable insert
Wendeschneidplatten

Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	Roughing Schruppen	Cast iron machining Grauguss Bearbeit.
insert shape Schneidplattenform	**DF**  A76	**PM**  A78	**DR** Double -side  A79	Flat  A79
	WG Wiper  A76	**DM**  A78		
	SF  A77	**EM**  A78		
	EF  A77	**NM**  A79		
	NF  A77			
Type · Typ **MWLNR / L**K / M06**	WN**0604**	WN**0604**	WN**0604**	WN**0604**
MWLNR / LK / M / P08**	WN**0804**	WN**0804**	WN**0804**	WN**0804**

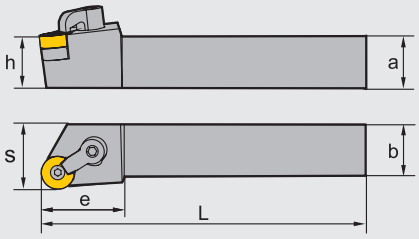
RN** Toolholder · Halter

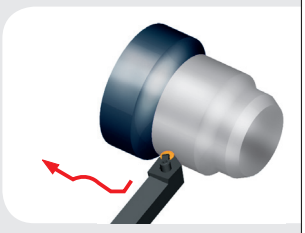
M-Clamping · M-Halter

MRGNR/ L



R type
Rechtsausführung



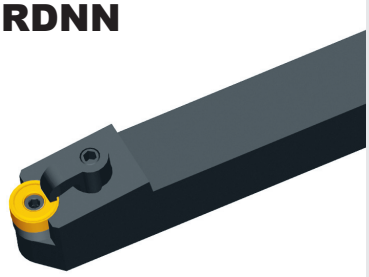


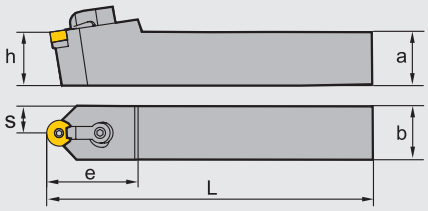
Type · Typ		Stock Lager		Dimension (mm) Abmessung						Application inserts Wendeschneid-platten	Clamping Screw Schraube	Shim Unterlage	Wrench Schlüssel	Clamp Pratze	Clamping stud Passstift
		R	L	a	b	L	h	s	e						
MRGNR/ L	**2020K12**	○	○	20	20	125	20	25	32	RN**1204** A80	DM6×25	R12BM	WH30L	C1RD	TM6×17
	2525M12	○	○	25	25	150	25	32	32		DM6×30				
	3225P12	○	○	32	25	170	32	32	32						
	3232P12	○	○	32	32	170	32	40	32						

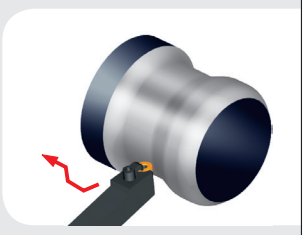
RN** Toolholder · Halter

M-Clamping · M-Halter

MRDNN







Type · Typ		Stock Lager	Dimension (mm) Abmessung						Application inserts Wendeschneid-platten	Clamping screw Schraube	Shim Unterlage	Wrench Schlüssel	Clamp Pratze	Clamping stud Passstift
			a	b	L	h	s	e						
MRDNN	**2020K12**	○	20	20	125	20	10	35	RN**1204** A80	DM6×25	R12BM	WH30L	C1RD	TM6×17
	2525M 12	○	25	25	150	25	12.5	35		DM6×30				
	3225P12	○	32	25	170	32	12.5	35						
	3232P12	○	32	32	170	32	16	35						

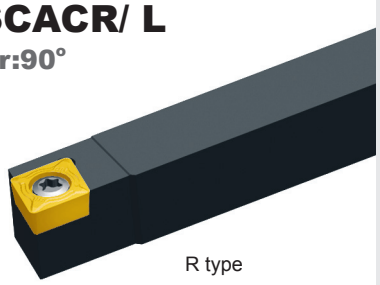
● ex stock · ab Lager ○ on demand · Anfrage

CC** Toolholder · Halter

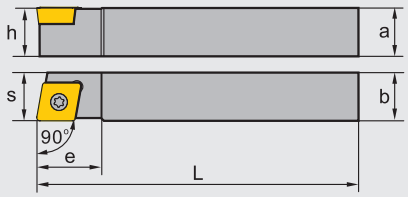
S-Clamping · S-Halter

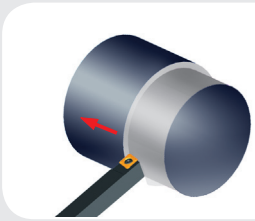
SCACR/ L

Kr:90°



R type
Rechtsausführung





Type · Typ		Stock Lager		Dimension (mm) Abmessung						Screw Schraube	Wrench Schlüssel		
		R	L	a	b	L	h	s	e				
SCACR/ L	**1010E06**	●	●	10	10	70	10	10.5	10	I60M2.5×6.5	WT07IP		
	1212F09	●	●	12	12	80	12	12.7	16	I60M3.5×8	WT15IP		

Applicable insert
Wendeschneidplatten

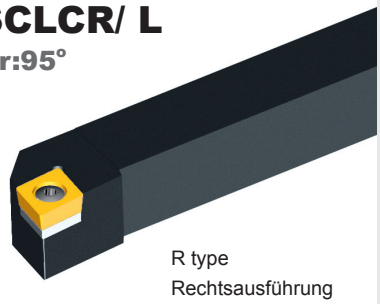
Application Anwendung	Extra Finishing Feinbearbeitung	Finishing Schlichten	Semi-finishing Mittlere Bearbeit.	Roughing Schruppen	Al machining Alu Bearbeitung	Cast iron machining Grauguss Bearbeit.	PCBN/PCD inserts/WSP
insert shape Schneidplattenform	**SF**  A84	**HF**  A84	**HM**  A85	**HR**  A86	**LH**  A86	 A86	 A123
		EF  A85	**EM**  A85				
Type · Typ **SCACR/ L**E06**	CC**0602**	CC**0602**	CC**0602**	CC**0602**	CCGX 0602**	CC** 0602**	CC** 0602**
SCACR/ LF09**	CC**09T3**	CC**09T3**	CC**09T3**	CC**09T3**	CCGX 09T3**	CC** 09T3**	CC** 09T3**

CC** Toolholder · Halter

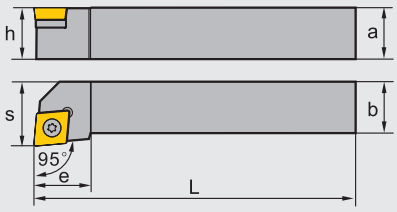
S-Clamping · S-Halter

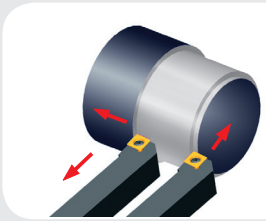
SCLCR/ L

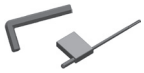
Kr:95°



R type
Rechtsausführung





Type · Typ		Stock Lager		Dimension (mm) Abmessung						Screw Schraube	Shim Unterlage	Shim Screw, Unterlage Schraube	Wrench Schlüssel
		R	L	a	b	L	h	s	e				
SCLCR/ L	**0808D06**	●	●	08	08	60	08	10	10	I60M2.5×6.5	—	—	WT07IP
	1010E06	●	●	10	10	70	10	12	10				
	1212F09	●	●	12	12	80	12	16	16	I60M3.5×8	—	—	WT15IP
	1616H09	●	●	16	16	100	16	20	16				
	2020K12	●	●	20	20	125	20	25	25	I60M4×11X	C12BS	SM6×10XA	WT15IP WH40L
	2525M12	●	●	25	25	150	25	32	26				
	3225P12	●	●	32	25	170	32	32	26				

Applicable insert Wendeschneidplatten

Application Anwendung	Extra Finishing Feinbearbeitung	Finishing Schlichten	Semi-finishing Mittlere Bearbeit.	Roughing Schruppen	Al machining Alu Bearbeitung	Cast iron mach. Gusseis. Bearb.	PCBN · PCD PCBN · PKD
insert shape Schneidplattenform	**SF**  A84	**HF**  A84	**HM**  A85	**HR**  A86	**LH**  A86	Flat  A86	Flat  A123
		EF  A85	**EM**  A85				
Type · Typ **SCLCR/ L**D / E06**	CC** 0602**	CC** 0602**	CC** 0602**	CC** 0602**	CCGX 0602**	CC** 0602**	CC** 0602**
Type · Typ **SCLCR / L*F / H09**	CC** 09T3**	CC** 09T3**	CC** 09T3**	CC** 09T3**	CCGX 09T3**	CC** 09T3**	CC** 09T3**
Type · Typ **SCLCR / L**K / M / P12**		CC** 1204**	CC** 1204**	CC** 1204**	CCGX 1204**	CC** 1204**	CC** 1204**

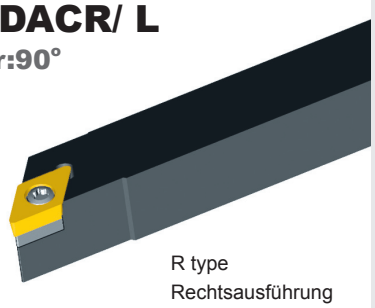
● ex stock · ab Lager ○ on demand · Anfrage

DC** Toolholder · Halter

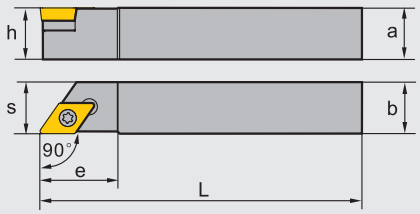
S-Clamping · S-Halter

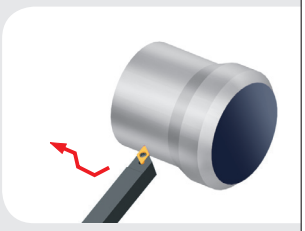
SDACR/ L

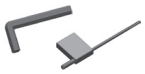
Kr:90°



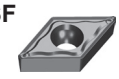
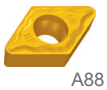
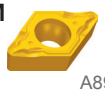
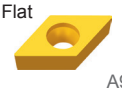
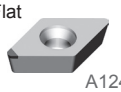
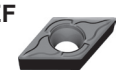
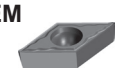
R type
Rechtsausführung





Type · Typ		Stock Lager		Dimension (mm) Abmessung						Screw Schraube	Shim Unterlage	Shim Screw, Unterlage Schraube	Wrench Schlüssel
		R	L	a	b	L	h	s	e				
SDACR/ L	**1010E07**	●	●	10	10	70	10	10.5	15	I60M2.5×6.5	—	—	WT07IP
	1212F11	●	●	12	12	80	12	12.5	15	I60M3.5×8	—	—	WT15IP
	1616H11	●	●	16	16	100	16	16.7	24	I60M3.5×12	D11BS	SM5×8.65XA	WT15IP WH35L

Applicable insert
Wendeschneidplatten

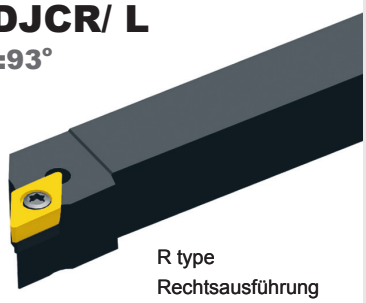
Application Anwendung	Extra Finishing Feinbearbeitung	Finishing Schlichten	Semi-finishing Mittlere Bearbeit.	Roughing Schruppen	Al machining Alu Bearbeitung	Cast iron mach. Gusseis. Bearb.	PCBN · PCD PCBN · PKD
insert shape Schneidplattenform	**SF**  A88	**HF**  A88	**HM**  A89	**HR**  A90	**LH**  A90	Flat  A90	Flat  A124
		EF  A89	**EM**  A89				
Type · Typ **SDACR / L**E07**	DC** 0702**	DC** 0702**	DC** 0702**		DCGX 0702**	DC**0702**	DC**0702**
SDACR / LF / H11**	DC** 11T3**	DC** 11T3**	DC** 11T3**	DC** 11T3**	DCGX 11T3**	DC** 11T3**	DC** 11T3**

DC** Toolholder · Halter

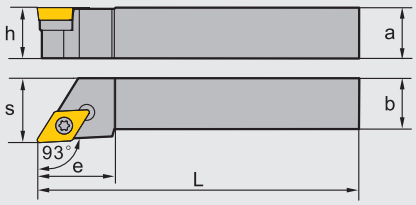
S-Clamping · S-Halter

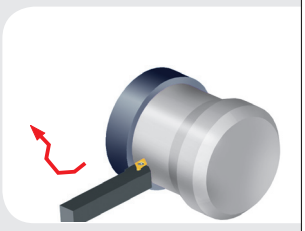
SDJCR/ L

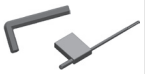
Kr:93°



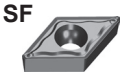
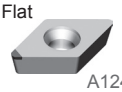
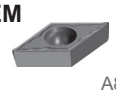
R type
Rechtsausführung





Type · Typ		Stock Lager		Dimension (mm) Abmessung						Screw Schraube	Shim Unterlage	Shim Screw, Unterlage Schraube	Wrench Schlüssel
		R	L	a	b	L	h	s	e				
SDJCR/ L	**1010E07**	●	●	10	10	70	10	12	15	I60M2.5×6.5	—	—	WT07IP
	1212F07	●	●	12	12	80	12	16	15				
	1616H07	●	●	16	16	100	16	20	18				
	1616H11	●	●	16	16	100	16	20	24	I60M3.5×12	D11BS	SM5×8.65XA	WT15IP WH35L
	2020K11	●	●	20	20	125	20	25	24				
	2525M11	●	●	25	25	150	25	32	29				
	3225P11	●	●	32	25	170	32	32	29				

Applicable insert
Wendeschneidplatten

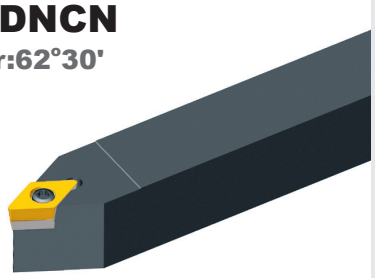
Application Anwendung	Extra Finishing Feinbearbeitung	Finishing Schlichten	Semi-finishing Mittlere Bearbeit.	Roughing Schruppen	Al machining Alu Bearbeitung	Cast iron mach. Gusseis. Bearb.	PCBN · PCD PCBN · PKD
insert shape Schneidplattenform	**SF**  A88	**HF**  A88	**HM**  A89	**HR**  A90	**LH**  A90	Flat  A90	Flat  A124
		EF  A89	**EM**  A89				
Type · Typ **SDJCR / L**E / F / H07**	DC**0702**	DC** 0702**	DC**0702**		DCGX 0702**	DC** 0702**	DC** 0702**
SDJCR / LH / K / M / P11**	DC** 11T3**	DC** 11T3**	DC**11T3**	DC**11T3**	DCGX 11T3**	DC** 11T3**	DC** 11T3**

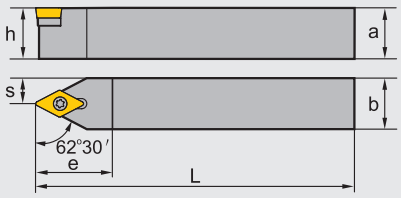
● ex stock · ab Lager ○ on demand · Anfrage

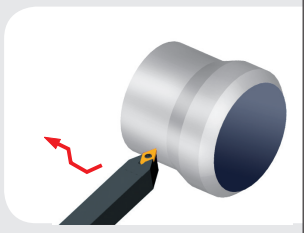
DC** Toolholder · Halter

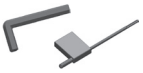
S-Clamping · S-Halter

SDNCN
Kr:62°30'

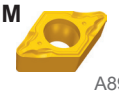
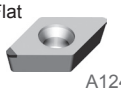
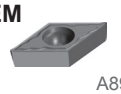






Type · Typ		Stock Lager	Dimension (mm) Abmessung						Screw Schraube	Shim Unterlage	Shim Screw, Unterlage Schraube	Wrench Schlüssel
			a	b	L	h	s	e				
SDNCN	**1010E07**	●	10	10	70	10	5	20	I60M2.5×6.5	—	—	WT07IP
	1212F07	●	12	12	80	12	6	20				
	1212H11	●	12	12	100	12	6	30	I60M3.5×8	—	—	WT15IP
	1616H11	●	16	16	100	16	8	30	I60M3.5×12	D11BS	SM5×8.65XA	WT15IP WH35L
	2020K11	●	20	20	125	20	10	30				
	2525M11	●	25	25	150	25	12.5	30				

Applicable insert Wendeschneidplatten

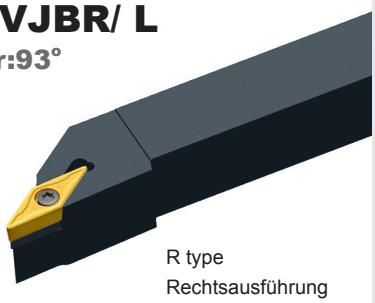
Application Anwendung	Extra Finishing Feinbearbeitung	Finishing Schlichten	Semi-finishing Mittlere Bearbeit.	Roughing Schruppen	Al machining Alu Bearbeitung	Cast iron mach. Gusseis. Bearb.	PCBN · PCD PCBN · PKD
insert shape Schneidplattenform	**SF**  A88	**HF**  A88	**HM**  A89	**HR**  A90	**LH**  A90	Flat  A90	Flat  A124
		EF  A89	**EM**  A89				
Type · Typ **SDNCN**E / F07**	DC**0702**	DC** 0702**	DC**0702**		DCGX 0702**	DC** 0702**	DC** 0702**
SDNCNH / K / M11**	DC** 11T3**	DC** 11T3**	DC**11T3**	DC**11T3**	DCGX 11T3**	DC** 11T3**	DC** 11T3**

VB** Toolholder · Halter

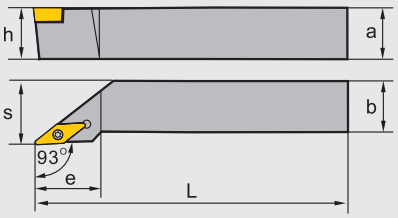
S-Clamping · S-Halter

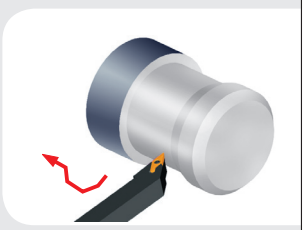
SVJBR/ L

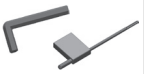
Kr:93°



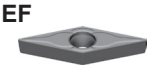
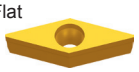
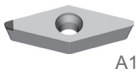
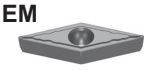
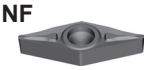
R type
Rechtsausführung





Type · Typ		Stock Lager		Dimension (mm) Abmessung						Screw Schraube	Shim Unterlage	Shim Screw, Unterlage Schraube	Wrench Schlüssel
		R	L	a	b	L	h	s	e				
SVJBR/ L	**1212F11**	●	●	12	12	80	12	16	27	I60M2.5×6.5	—	—	WT07IP
	1616H11	●	●	16	16	100	16	20	27				
	2020K11	●	●	20	20	125	20	25	27				
	2525M11	●	●	25	25	150	25	32	27				
	1616H16	●	●	16	16	100	16	20	36	I60M3.5×12	V16BS	SM5×8.65XA	WT15IP WH35L
	2020K16	●	●	20	20	125	20	25	41				
	2525M16	●	●	25	25	150	25	32	41				
	3225P16	●	●	32	25	170	32	32	41				

Applicable insert
Wendeschneidplatten

Application Anwendung	Extra Finishing Feinbearbeitung	Finishing Schlichten	Semi-finishing Mittlere Bearbeit.	Roughing Schruppen	Cast iron mach. Gusseis. Bearb.	PCBN · PCD PCBN · PKD
insert shape Schneidplattenform	**SF**  A108	**EF**  A108	**HM**  A109	**HR**  A109	Flat  A109	Flat  A126
		HF  A108	**EM**  A109			
		NF  A108				

Type · Typ							
	SVJBR / LF / H / K / M11**	VB**1102**	VB**1102**	VB**1102**			
	SVJBR / LH / K / M / P16**		VB**1604**	VB**1604**	VB**1604**	VB**1604**	VB**1604**

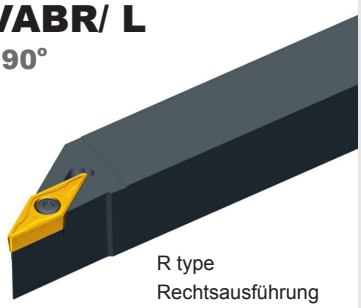
● ex stock · ab Lager ○ on demand · Anfrage

VB** Toolholder · Halter

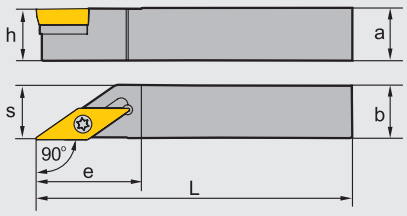
S-Clamping · S-Halter

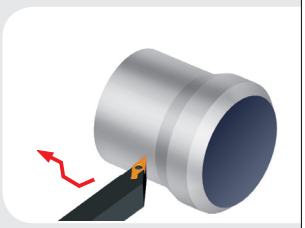
SVABR/ L

Kr:90°



R type
Rechtsausführung





Type · Typ		Stock Lager R	Stock Lager L	Dimension (mm) Abmessung a	b	L	h	s	e	Screw Schraube	Shim Unterlage	Shim Screw, Unterlage Schraube	Wrench Schlüssel
SVABR/ L	**1010F11**			10	10	80	10			I60M2.5×6.5	—	—	WT07IP
	1616H16	●	●	16	16	100	16	16.5	28	I60M3.5×12	V16BS	SM5×8.65XA	WT15IP WH35L
	2020K16	●	●	20	20	125	20	20.5	28				
	2525M16	●	●	25	25	150	25	25.5	28				

Applicable insert
Wendeschneidplatten

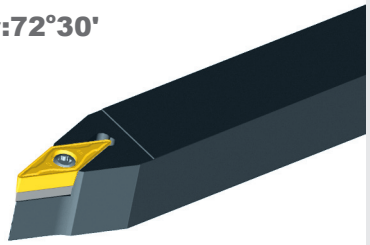
Application Anwendung	Extra Finishing Feinbearbeitung	Finishing Schlichten	Semi-finishing Mittlere Bearbeit.	Roughing Schruppen	Cast iron mach. Gusseis. Bearb.	PCBN · PCD PCBN · PKD
insert shape Schneidplattenform	**SF** A108	**EF** A108	**HM** A109	**HR** A109	Flat A109	Flat A126
		HF A108	**EM** A109			
		NF A108				
Type · Typ **SVABR / L**F11**	VB**1102**	VB**1102**	VB**1102**			
SVABR / LH / K / M16**		VB**1604**	VB**1604**	VB**1604**	VB**1604**	VB**1604**

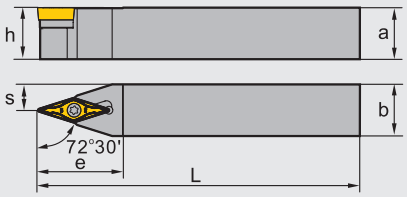
VB** Toolholder · Halter

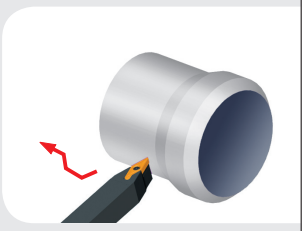
S-Clamping · S-Halter

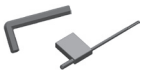
SVVBN

Kr:72°30'

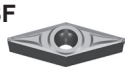
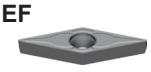
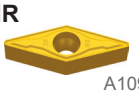
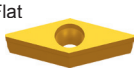
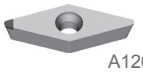
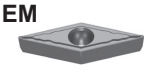
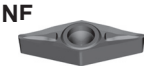






Type · Typ		Stock Lager	Dimension (mm) Abmessung						Screw Schraube	Shim Unterlage	Shim Screw, Unterlage Schraube	Wrench Schlüssel
			a	b	L	h	s	e				
SVVBN	**1212F11**	●	12	12	80	12	6	27	I60M2.5×6.5	—	—	WT07IP
	1616H11	●	16	16	100	16	8	27				
	2020K11	●	20	20	125	20	10	30				
	1616H16	●	16	16	100	16	8	33	I60M3.5×12	V16BS	SM5×8.65XA	WT15IP WH35L
	2020K16	●	20	20	125	20	10	33				
	2525M16	●	25	25	150	25	12.5	38				

Applicable insert
Wendeschneidplatten

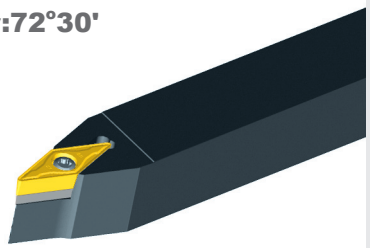
Application Anwendung	Extra Finishing Feinbearbeitung	Finishing Schlichten	Semi-finishing Mittlere Bearbeit.	Roughing Schruppen	Cast iron mach. Gusseis. Bearb.	PCBN · PCD PCBN · PKD
insert shape Schneidplattenform	**SF**  A108	**EF**  A108	**HM**  A109	**HR**  A109	Flat  A109	Flat  A126
		HF  A108	**EM**  A109			
		NF  A108				
Type · Typ **SVVBN**F / H / K11**	VB**1102**	VB**1102**	VB**1102**			
Type · Typ **SVVBN**H / K / M16**		VB**1604**	VB**1604**	VB**1604**	VB**1604**	VB**1604**

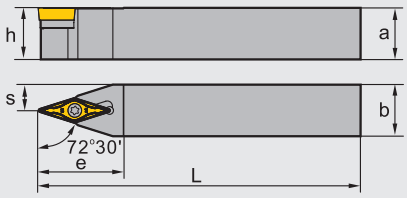
● ex stock · ab Lager ○ on demand · Anfrage

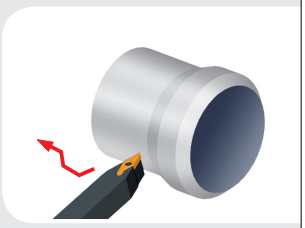
VC** Toolholder · Halter

S-Clamping · S-Halter

SVVCN
Kr:72°30'







Type · Typ		Stock Lager	Dimension (mm) Abmessung						Screw Schraube	Shim Unterlage	Shim Screw, Unterlage Schraube	Wrench Schlüssel
			a	b	L	h	s	e				
SVVCN	**1212F11**	●	12	12	80	12	6	27	I60M2.5×6.5	—	—	WT07IP
	1212M11	●	12	12	150	12	6	27				
	1616H11	●	16	16	100	16	8	27				
	2020K11	●	20	20	125	20	10	30				
	2525M11	●	25	25	150	25	12.5	38				
	1616H16	●	16	16	100	16	8	33	I60M3.5×12	V16BSC	SM5×8.65XA	WT15IP WH35L
	2020K16	●	20	20	125	20	10	33				
	2525M16	●	25	25	150	25	12.5	38				

Applicable insert Wendeschneidplatten

Application Anwendung	Extra Finishing Feinbearbeitung	Finishing Schlichten	Al machining Alu Bearbeitung	PCBN · PCD PCBN · PKD
insert shape Schneidplattenform	**SF**  A106	**HF**  A106	**LH**  A107	Flat  A126
		NF  A106		

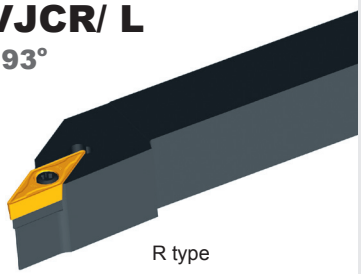
Type · Typ				
SVVCNF / H / K / M11**	VC**1103**	VC**1103**	VCGX1103**	
SVVCNH / K / M16**		VC**1604**	VCGX1604**	VC**1604**

VC** Toolholder · Halter

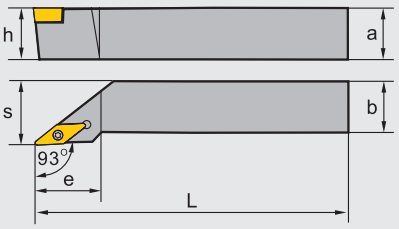
S-Clamping · S-Halter

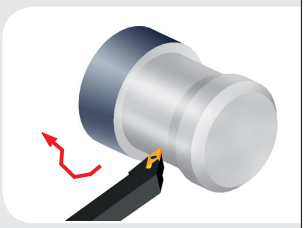
SVJCR/ L

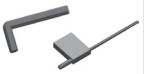
Kr:93°



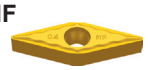
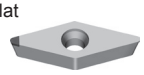
R type
Rechtsausführung





Type · Typ		Stock Lager		Dimension (mm) Abmessung						Screw Schraube	Shim Unterlage	Shim Screw, Unterlage Schraube	Wrench Schlüssel
		R	L	a	b	L	h	s	e				
SVJCR/ L	**1010E11**			10	10	70	10	12	22	I60M2.5×6.5	—	—	WT07IP
	1212F11	●	●	12	12	80	12	16	27				
	1616H11	●	●	16	16	100	16	20	27				
	2020K11	●	●	20	20	125	20	25	27				
	2525M11	●	●	25	25	150	25	32	27				
	1616H16	●	●	16	16	100	16	20	36	I60M3.5×12	V16BSC	SM5×8.65XA	WT15IP WH35L
	2020K16	●	●	20	20	125	20	25	41				
	2525M16	●	●	25	25	150○	2○	32	41				
	3225P16			32	25	170	32	32	41				

Applicable insert
Wendeschneidplatten

Application Anwendung	Extra Finishing Feinbearbeitung	Finishing Schlichten	Al machining Alu Bearbeitung	PCBN · PCD PCBN · PKD
insert shape Schneidplattenform	**SF**  A106	**HF**  A106	**LH**  A107	Flat  A126
		NF  A106		

Type · Typ				
SVJCR / LE / F / H / K / M11**	VC**1103**	VC**1103**	VCGX1103**	
SVJCR / LH / K / M / P16**		VC**1604**	VCGX1604**	VC**1604**

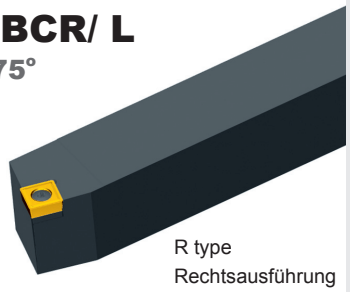
● ex stock · ab Lager ○ on demand · Anfrage

SC** Toolholder · Halter

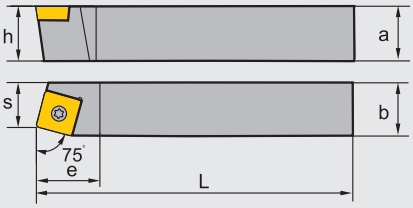
S-Clamping · S-Halter

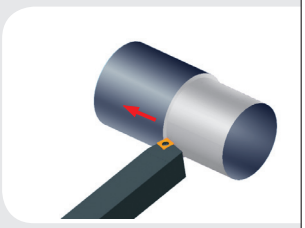
SSBCR/ L

Kr:75°



R type
Rechtsausführung





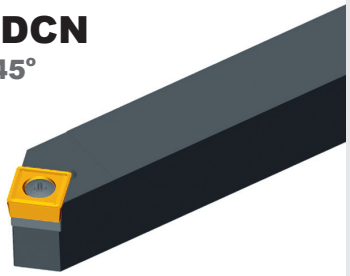
Type · Typ		Stock Lager		Dimension (mm) Abmessung						Screw Schraube	Shim Unterlage	Shim Screw, Unterlage Schraube	Wrench Schlüssel
		R	L	a	b	L	h	s	e				
SSBCR/ L	**1212F09**	●	●	12	12	80	12	11	16	I60M3.5×8	—	—	WT15IP
	1616H09	●	●	16	16	100	16	13	16	I60M3.5×8	S09BS	SM5×8.65XA	WT15IP WH35L
	2020K12	●	●	20	20	125	20	17	25	I60M4×11X	S12BS	SM6×10XA	WT15IP WH40L

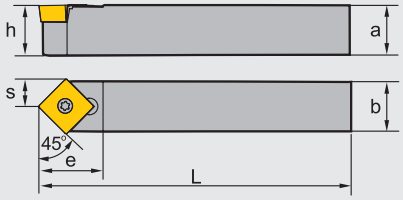
SC** Toolholder · Halter

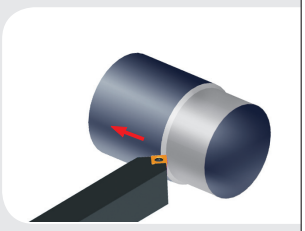
S-Clamping · S-Halter

SSDCN

Kr:45°







Type · Typ		Stock Lager	Dimension (mm) Abmessung						Screw Schraube	Shim Unterlage	Shim Screw, Unterlage Schraube	Wrench Schlüssel
			a	b	L	h	s	e				
SSDCN	**1212F09**	●	12	12	80	12	6	15.5	I60M3.5×8	—	—	WT15IP
	1616H09	●	16	16	100	16	8	15.5	I60M3.5×12	S09BS	SM5×8.65XA	WT15IP WH35L

Applicable insert
Wendeschneidplatten

Application Anwendung	Extra Finishing Feinbearbeitung	Finishing Schlichten	Semi-finishing Mittlere Bearbeit.	Al machining Alu Bearbeitung	Cast iron machining Gusseisen Bearbeit.
insert shape Schneidplattenform	**HF**  A94	**HM**  A94	**HR**  A95	**LH**  A95	Flat  A95
	EF  A94	**EM**  A94			

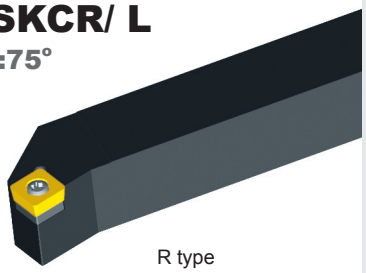
Type · Typ						
	SSBCR / LF / H09**	SC**09T3**	SC**09T3**	SC**09T3**	SCGX09T3**	SC**09T3**
	SSBCR / LK12**		SC**1204**	SC**1204**	SCGX1204**	SC**1204**
	SSDCNF / H09**	SC**09T3**	SC**09T3**	SC**09T3**	SCGX09T3**	SC**09T3**

SC** Toolholder · Halter

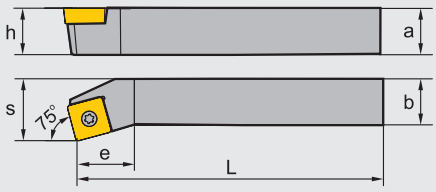
S-Clamping · S-Halter

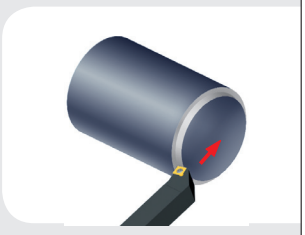
SSKCR/ L

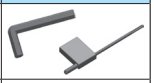
Kr:75°



R type
Rechtsausführung

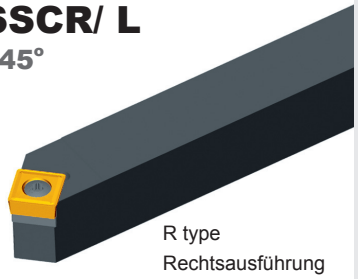




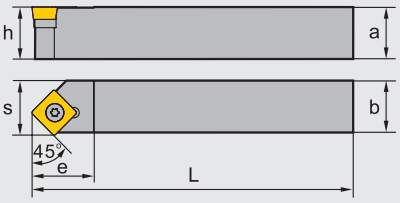
Type · Typ		Stock Lager		Dimension (mm) Abmessung						Screw Schraube	Shim Unterlage	Shim Screw, Unterlage Schraube	Wrench Schlüssel
		R	L	a	b	L	h	s	e				
SSKCR/ L	**1616H09**	●	●	16	16	100	16	20	13	I60M3.5×12	S09BS	SM5×8.65XA	WT15IP WH35L

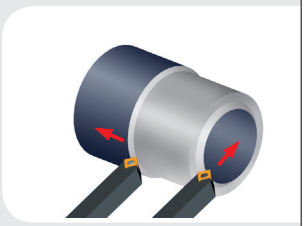
SSSCR/ L

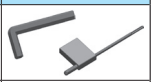
Kr:45°



R type
Rechtsausführung





Type · Typ		Stock Lager		Dimension (mm) Abmessung						Screw Schraube	Shim Unterlage	Shim Screw, Unterlage Schraube	Wrench Schlüssel
		R	L	a	b	L	h	s	e				
SSSCR/ L	**1616H09**	●	●	16	16	100	16	17	16	I60M3.5×12	—	—	WT15IP
	2020K12	●	●	20	20	125	20	21	24	I60M4×11X	S12BS	SM6×10XA	WT15IP WH40L

Applicable insert
Wendeschneidplatten

Application Anwendung	Extra Finishing Feinbearbeitung	Finishing Schlichten	Semi-finishing Mittlere Bearbeit.	Al machining Alu Bearbeitung	Cast iron machining Gusseisen Bearbeit.
insert shape Schneidplattenform	**HF**  A94	**HM**  A94	**HR**  A95	**LH**  A95	Flat  A95
	EF  A94	**EM**  A94			

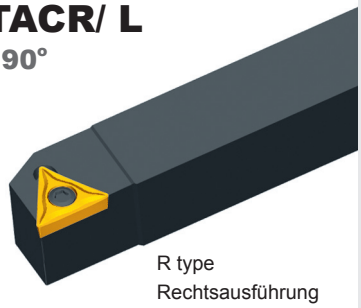
Type · Typ					
SSKCR / L**H09**	SC**09T3**	SC**09T3**	SC**09T3**	SCGX09T3**	SC**09T3**
SSSCR / L**H09**	SC**09T3**	SC**09T3**	SC**09T3**	SCGX09T3**	SC**09T3**
SSSCR / L**K12**		SC**1204**	SC**1204**	SCGX1204**	SC**1204**

● ex stock · ab Lager ○ on demand · Anfrage

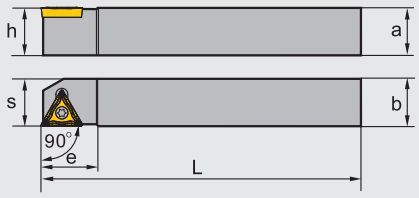
TC** Toolholder · Halter

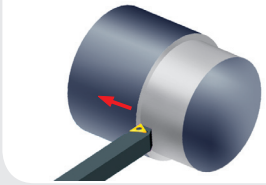
S-Clamping · S-Halter

STACR/ L
Kr:90°



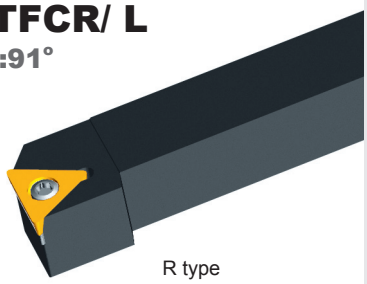
R type
Rechtsausführung



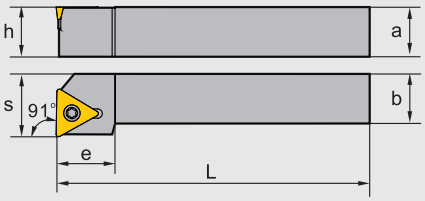


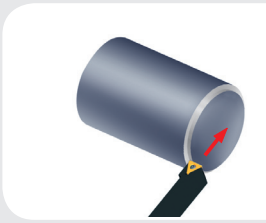
Type · Typ		Stock Lager R	Stock Lager L	Dimension (mm) Abmessung a	b	L	h	s	e	Screw Schraube	Wrench Schlüssel		
STACR/ L	**1212F11**	●	●	12	12	80	12	12.5	14	I60M2.5×6.5	WT07IP		

STFCR/ L
Kr:91°



R type
Rechtsausführung





Type · Typ		Stock Lager R	Stock Lager L	Dimension (mm) Abmessung a	b	L	h	s	e	Screw Schraube	Shim Unterlage	Shim Screw, Unterlage Schraube	Wrench Schlüssel
STFCR/ L	**1212F11**	●	●	12	12	80	12	16	14	I60M2.5×6.5	—	—	WT07IP
	1616H11	●	●	16	16	100	16	20	14				
	1616H16	●	●	16	16	100	16	20	19	I60M3.5×12	T16BS	SM5×8.65XA	WT15IP WH35L
	2020K16	●	●	20	20	125	20	25	19				

Applicable insert Wendeschneidplatten

Application Anwendung	Extra Finishing Feinbearbeitung	Finishing Schlichten	Semi-finishing Mittlere Bearbeit.	Roughing Schruppen	Al machining Alu Bearbeitung	Cast iron machining	PCBN/PCD inserts/WSP
insert shape Schneidplattenform	**SF** A98	**HF** A99	**HM** A101	**HR** A101	**LH** A101	Flat A102	Flat A125
		EF A100	**EM** A100				

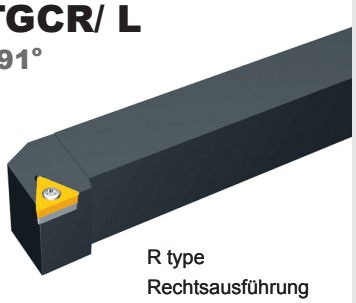
Type · Typ								
	STACR / LF11**	TC**1102**	TC**1102**	TC**1102**	TC**1102**	TCGX1102**	TC**1102**	TC**1102**
	STFCR / LF / H11**	TC**1102**	TC**1102**	TC**1102**	TC**1102**	TCGX1102**	TC**1102**	TC**1102**
	STFCR / LH / K16**		TC**16T3**	TC**16T3**	TC**16T3**	TCGX16T3**	TC**16T3**	TC**16T3**

TC** Toolholder · Halter

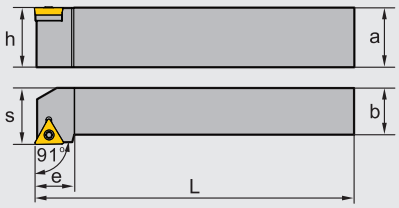
S-Clamping · S-Halter

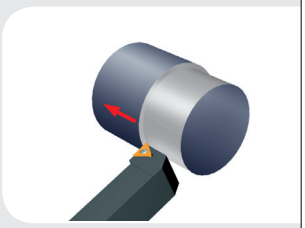
STGCR/ L

Kr:91°



R type
Rechtsausführung





Type · Typ		Stock Lager R	Stock Lager L	Dimension (mm) Abmessung a	b	L	h	s	e	Screw Schraube	Shim Unterlage	Shim Screw, Unterlage Schraube	Wrench Schlüssel
STGCR/ L	**0808D09**	●	●	08	08	60	8	10	11	I60M2.2×5.5	—	—	WT06IP
	1010E09	●	●	10	10	70	10	12	11				
	1212F11	●	●	12	12	80	12	16	14	I60M2.5×6.5	—	—	WT07IP
	1616H11	●	●	16	16	100	16	20	16				
	2020K16	●	●	20	20	125	20	25	21	I60M3.5×12	T16BS	SM5×8.65XA	WT15IP WH35L
	2525M16	●	●	25	25	150	25	32	21				

Applicable insert
Wendeschneidplatten

Application Anwendung	Extra Finishing Feinbearbeitung	Finishing Schlichten	Semi-finishing Mittlere Bearbeit.	Roughing Schruppen	Al machining Alu Bearbeitung	Cast iron machining	PCBN/PCD inserts/WSP
insert shape Schneidplattenform	**SF** A98	**HF** A99	**HM** A101	**HR** A101	**LH** A101	Flat A102	Flat A125
		EF A100	**EM** A100				
Type · Typ **STGCR / L**D / E09**	TC**0902**	TC**0902**	TC**0902**	TC**0902**	TCGX0902**	TC**0902**	TC**0902**
STGCR / LF / H11**	TC**1102**	TC**1102**	TC**1102**	TC**1102**	TCGX1102**	TC**1102**	TC**1102**
STGCR / LK / M16**		TC**16T3**	TC**16T3**	TC**16T3**	TCGX16T3**	TC**16T3**	TC**16T3**

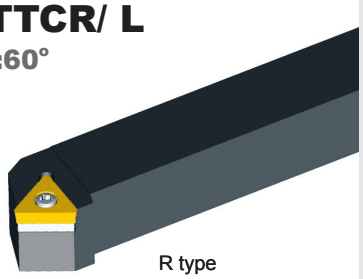
● ex stock · ab Lager ○ on demand · Anfrage

TC** Toolholder · Halter

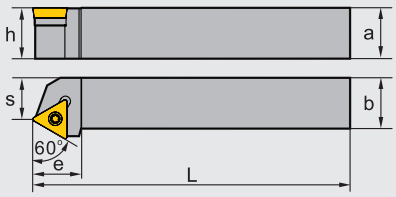
S-Clamping · S-Halter

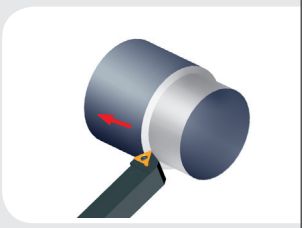
STTCR/ L

Kr:60°



R type
Rechtsausführung





Type · Typ		Stock Lager R	Stock Lager L	Dimension (mm) Abmessung a	b	L	h	s	e	Screw Schraube	Shim Unterlage	Shim Screw, Unterlage Schraube	Wrench Schlüssel
STTCR/ L	**1616H11**	●	●	16	16	100	16	13	14	I60M2.5×6.5	—	—	WT07IP
	1616H16	●	●	16	16	100	16	13	19	I60M3.5×12	T16BS	SM5×8.65XA	WT15IP WH35L
	2020K16	●	●	20	20	125	20	17	19				

Applicable insert
Wendeschneidplatten

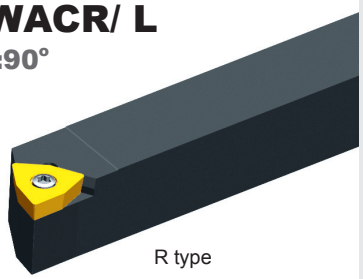
Application Anwendung	Extra Finishing Feinbearbeitung	Finishing Schlichten	Semi-finishing Mittlere Bearbeit.	Roughing Schruppen	Al machining Alu Bearbeitung	Cast iron machining	PCBN/PCD inserts/WSP
insert shape Schneidplattenform	**SF** A98	**HF** A99	**HM** A101	**HF** A101	**LH** A101	Flat A102	Flat A125
		EF A100	**EM** A100				
Type · Typ **STTCR / L**H11**	TC**1102**	TC**1102**	TC**1102**	TC**1102**	TCGX1102**	TC**1102**	TC**1102**
STTCR / LH / K16**		TC**16T3**	TC**16T3**	TC**16T3**	TCGX16T3**	TC**16T3**	TC**16T3**

WC** Toolholder · Halter

S-Clamping · S-Halter

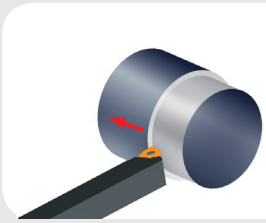
SWACR/ L

Kr:90°



R type
Rechtsausführung





Type · Typ		Stock Lager R	Stock Lager L	Dimension (mm) Abmessung a	b	L	h	s	e	Screw Schraube	Wrench Schlüssel		
SWACR/ L	**1010E04**	●	●	10	10	70	10	10.5	10	I60M2.5×6.5	WT07IP		
	1212F04	●	●	12	12	80	12	12.○	14				
	1616H06	●	●	16	16	100	16	16.5	20	I60M3×7	WT10IP		
	2020K08	●	●	20	20	125	20	20.5	24	I60M3.5×12	WT15IP		

Applicable insert
Wendeschneidplatten

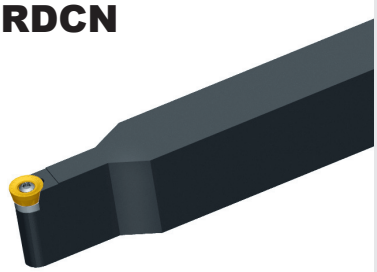
Application Anwendung	Finishing Schlichten
insert shape Schneidplattenform	**53**  A111
Type · Typ **SWACR / L**E / F04**	WC*X0402**
SWACR / LH06**	WC*X06T3**
SWACR / LK08**	WC*X0804**

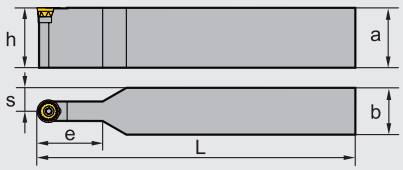
● ex stock · ab Lager ○ on demand · Anfrage

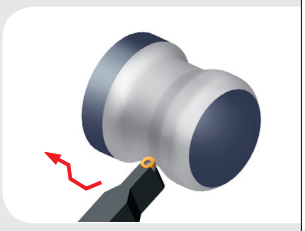
RC** Toolholder · Halter

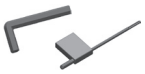
S-Clamping · S-Halter

SRDCN







Type · Typ		Stock Lager	Dimension (mm) Abmessung						Screw Schraube	Shim Unterlage	Shim Screw, Unterlage Schraube	Wrench Schlüssel
			a	b	L	h	s	e				
SRDCN	**1616H08**	●	16	16	100	16	8	16	I60M3×7	—	—	WT10IP
	1616H10		16	16	100	16	8	25	I60M3.5×10	—	—	WT15IP
	2020K10		20	20	125	20	10	25				
	2525M10	●	25	25	150	25	12.5	25				
	2020K12	●	20	20	125	20	10	35	I60M3.5×12	R12BS	SM5×8.65XA	WT15IP WH35L
	2525M12	●	25	25	150	25	12.5	35				
	3225P12	●	32	25	170	32	12.5	35				
	3225P16	●	32	25	170	32	12.5	35	I60M4×15X	R16BS	SM6×10XA	WT15IP WH40L
	3232P16	●	32	32	170	32	16	40				
	4040S16	●	40	40	250	40	20	50				

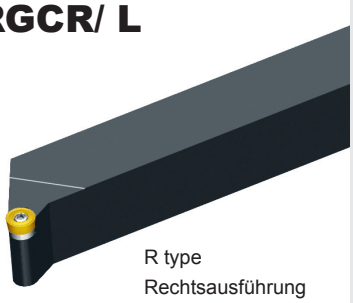
Applicable insert
Wendeschneidplatten

Application Anwendung		Semi-Finishing Mittlere Bearbeitung	Roughing Schruppen	Al machining Alu Bearbeitung	Roughing Schruppen
insert shape Schneidplattenform		 A92	 A92	LH  A92	Basic  A93
Type · Typ	**SRDCN**H08**	RCMT0803MO	RCMT0803MO	RCGX0803MO-LH	RCMT0803MO
	SRDCNH / K / M10**	RCMT1003 MO	RCMT1003 MO		RCMT1003 MO
	SRDCNK / M / P12**	RCMT1204 MO	RCMT1204 MO		RCMT1204 MO
	SRDCNP / S16**	RCMT1606 MO	RCMT1606 MO		RCMT1606 MO

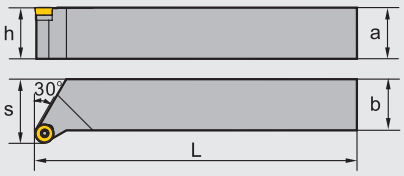
RC** Toolholder · Halter

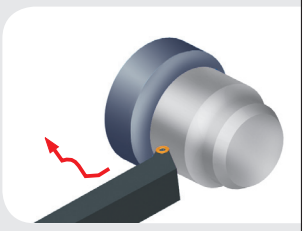
S-Clamping · S-Halter

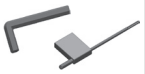
SRGCR/ L



R type
Rechtsausführung





Type · Typ		Stock Lager		Dimension (mm) Abmessung						Screw Schraube	Shim Unterlage	Shim Screw, Unterlage Schraube	Wrench Schlüssel
		R	L	a	b	L	h	s					
SRGCR/ L	**1616H08**			16	16	100	16	20		I60M3×7	—	—	WT10IP
	1616H10			16	16	100	16	20		I60M3.5×10	—	—	WT15IP
	2020K10	●	●	20	20	125	20	25					
	2525M10	●	●	25	25	100	25	32					
	2020K12	●	●	20	20	125	20	27		I60M3.5×12	R12BS	SM5×8.65XA	WT15IP WH35L
	2525M12	●	●	25	25	150	25	32					

Applicable insert Wendeschneidplatten

Application Anwendung	Semi-Finishing Mittlere Bearbeitung	Roughing Schruppen	Al machining Alu Bearbeitung	Roughing Schruppen
insert shape Schneidplattenform	 A92	 A92	LH  A92	Basic  A93
Type · Typ **SRGCR / L**H08**	RCMT0803MO	RCMT0803MO	RCGX0803MO-LH	RCMT0803MO
SRGCR / LH / K / M10**	RCMT1003 MO	RCMT1003 MO		RCMT1003 MO
SRGCR / LK / M12**	RCMT1204 MO	RCMT1204 MO		RCMT1204 MO

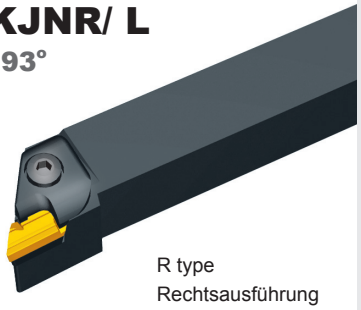
● ex stock · ab Lager ○ on demand · Anfrage

KNUX** Toolholder · Halter

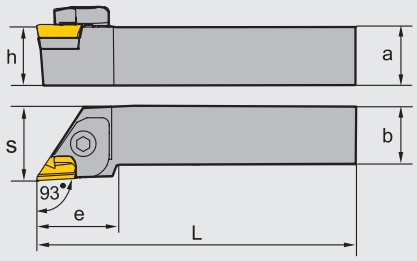
C-Clamping · C-Halter

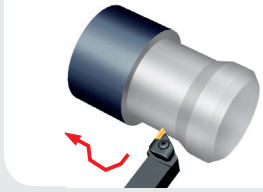
CKJNR/ L

Kr:93°



R type
Rechtsausführung

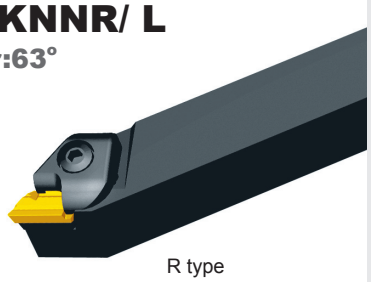




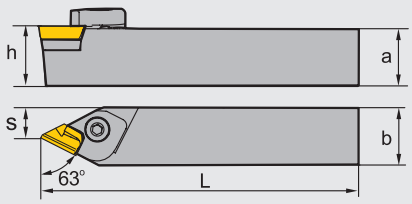
Type · Typ		Stock Lager	Dimension (mm) Abmessung						Application inserts Wendeschneid -platten	Clamp Pratze	Clamp PratzeScrew Schraube	Spring Feder	Clamping stud Passstift	Shim Unterlage	Shim Screw, Unterlage Schraube	Wrench Schlüssel
			a	b	L	h	s	e								
CKJNR	**2525M16**	●	25	25	150	25	32	32	KNUX1604**R A81	C6R1T	CM6×25A	SPR1 SPR2	P0515	K16CC	SM3×10B	WH20L WH40L
	3232P16	●	32	32	170	32	40	3○								
	4040R16	●	40	40	200	40	50	32○								
CKJNL	**2525M16**	●	25	25	150	25	32	32	KNUX1604**L A81	C6L1T				K16CCL		
	3232P16	●	32	32	170	32	40	32								
	4040R16	●	40	40	200	40	50	32								

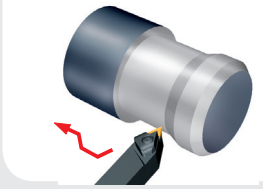
CKNNR/ L

Kr:63°



R type
Rechtsausführung





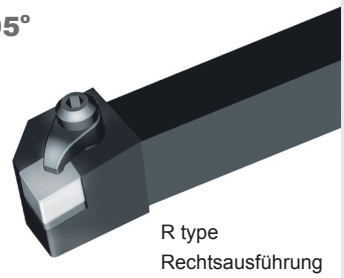
Type · Typ		Stock Lager	Dimension (mm) Abmessung					Application inserts Wendeschneid- platten	Clamp Pratze	Clamp PratzeScrew Schraube	Spring Feder	Clamping stud Passstift	Shim Unterlage	Shim Screw, Unterlage Schraube	Wrench Schlüssel
			a	b	L	h	s								
CKNNR	**2525M16**	○	25	25	150	25	14.3	KNUX1604**R A81	C6R1T	CM6×25A	SPR1 SPR2	P0515	K16CC	SM3×10B	WH20L WH40L
	3232P16	○	32	32	170	32	16.8								
CKNNL	**2525M16**	○	25	25	150	25	14.3	KNUX1604**L A81	C6L1T	CM6×25A	SPR1 SPR2	P0515	K16CCL	SM3×10B	
	3232P16	○	32	32	170	32	16.8								

CN** Toolholder · Halter

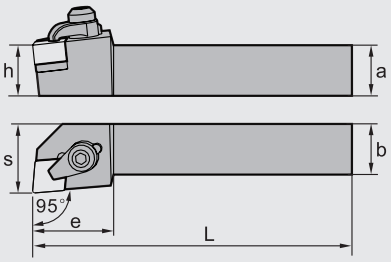
C-Clamping · C-Halter

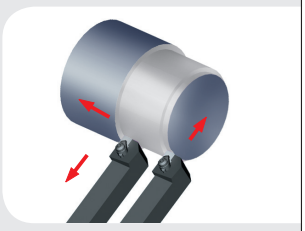
CCLNR/ L

Kr:95°



R type
Rechtsausführung





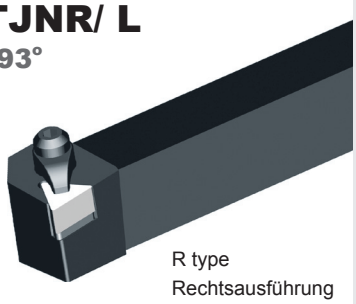
Type · Typ		Stock Lager		Dimension (mm) Abmessung						Application inserts Wendeschneid-platten	Clamp Pratze	Clamp screw Schraube	Wrench Schlüssel	Shim Unterlage	Shim screw Schraube	Spring Feder
		R	L	a	b	L	h	s	e							
CCLNR/ L	**2020K12**	●	○	20	20	125	20	27	32	CNGN1207** (1204**) A139	C1RC	CM6×30B	WH20L WH40L	C12CC-07 (C12CC-04)	SM3×10B	SPR1
	2525M12	●	●	25	20	100	25	27	36							
	2525M16	○	○	25	25	150	25	32	36	CNGN1606** (1604**) A139	C2RC	CM8×30B	WH30L WH50L	C16CC-06 (16CC-04)	SM4×12B	SPR3
	3225P16	○	○	32	25	170	32	32	36							

TN** Toolholder · Halter

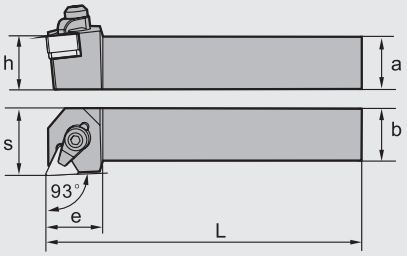
C-Clamping · C-Halter

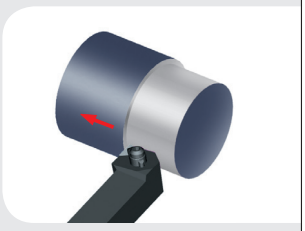
CTJNR/ L

Kr:93°



R type
Rechtsausführung





Type · Typ		Stock Lager		Dimension (mm) Abmessung						Application inserts Wendeschneid-platten	Clamp Pratze	Clamp screw Schraube	Wrench Schlüssel	Shim Unterlage	Shim screw Schraube	Spring Feder
		R	L	a	b	L	h	s	e							
CTJNR/ L	**2020K16**	○	○	20	20	125	20	25	30	TNGN1607** (1604**) A145	C1RC	CM6×30B	WH20L WH40L	T16CC-07 (T16CC-04)	SM3×10B	SPR1
	2525M16	○	○	25	25	150	25	32	30							

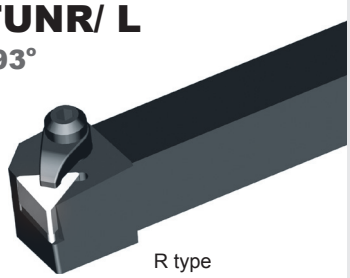
● ex stock · ab Lager ○ on demand · Anfrage

TN** Toolholder · Halter

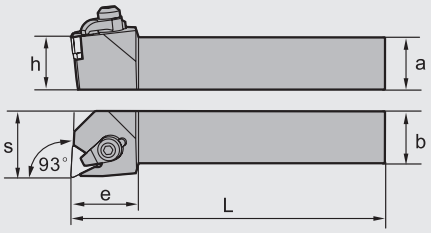
C-Clamping · C-Halter

CTUNR/ L

Kr:93°



R type
Rechtsausführung





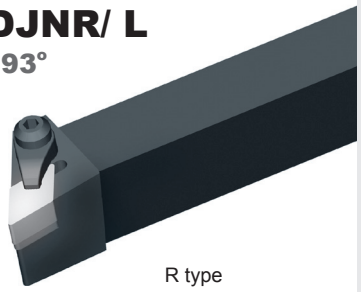
Type · Typ		Stock Lager		Dimension (mm) Abmessung						Application inserts Wendeschneid-platten	Clamp Pratze	Clamp screw Schraube	Wrench Schlüssel	Shim Unterlage	Shim screw Schraube	Spring Feder
		R	L	a	b	L	h	s	e							
CTUNR/ L	**2020K12**			20	20	125	20	25	27	TNGN1607** (1604**) A145	C1RC	CM6×30B	WH20L WH40L	T16CC-07 (T16CC-04)	SM3×10B	SPR1
	2525M16	○	○	25	25	150	25	32	27							

DN** Toolholder · Halter

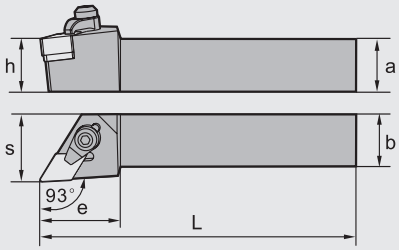
C-Clamping · C-Halter

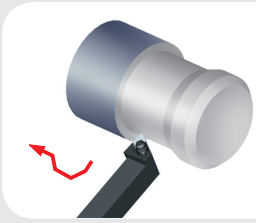
CDJNR/ L

Kr:93°



R type
Rechtsausführung





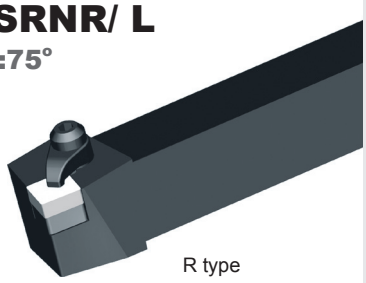
Type · Typ		Stock Lager		Dimension (mm) Abmessung						Application inserts Wendeschneid-platten	Clamp Pratze	Clamp screw Schraube	Wrench Schlüssel	Shim Unterlage	Shim screw Schraube	Spring Feder
		R	L	a	b	L	h	s	e							
CDJNR/ L	**2525M15**	●	●	25	25	150	25	32	32	DNGN1507** (1504**) A141	C1RC	CM6×30B	WH20L WH40L	D15CC-07 (D15CC-04)	SM3×10B	SPR1
	3225P15	○	○	32	25	170	32	32	32							

SN** Toolholder · Halter

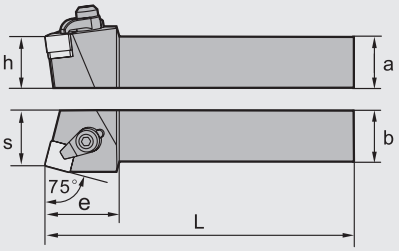
C-Clamping · C-Halter

CSRNR/ L

Kr:75°



R type
Rechtsausführung





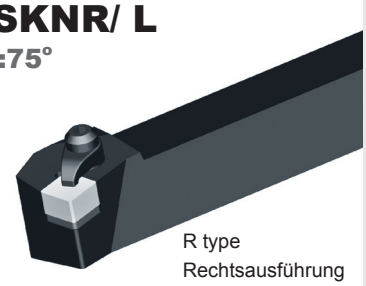
Type · Typ		Stock Lager		Dimension (mm) Abmessung						Application inserts Wendeschneid-platten	Clamp Pratze	Clamp screw Schraube	Wrench Schlüssel	Shim Unterlage	Shim screw Schraube	Spring Feder
		R	L	a	b	L	h	s	e							
CSRNR/ L	**2020K12**	○	○	20	20	125	20	22	32	SNGN1207** (1204**) A143	C1RC	CM6×30B	WH20L WH40L	S12CC-07 (S12CC-04)	SM3×10B	SPR1
	2525M12	○	○	25	20	100	25	27	32							
	3225P12	○	○	32	25	170	32	27	32							
	3225P15	○	○	32	25	170	32	32	40	SNGN1507** A143	C2RC	CM8×30B	WO30L WH50L	S15CC-07	SM4×12B	SPR3
	4040R15	○	○	40	40	200	40	43	40							

SN** Toolholder · Halter

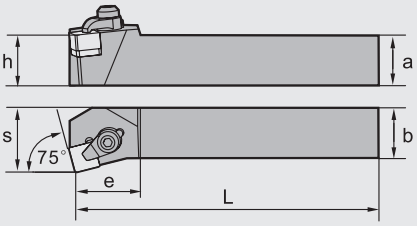
C-Clamping · C-Halter

CSKNR/ L

Kr:75°



R type
Rechtsausführung





Type · Typ		Stock Lager		Dimension (mm) Abmessung						Application inserts Wendeschneid-platten	Clamp Pratze	Clamp screw Schraube	Wrench Schlüssel	Shim Unterlage	Shim screw Schraube	Spring Feder
		R	L	a	b	L	h	s	e							
CSKNR/ L	**2020K12**	○	○	20	20	125	20	25	25	SNGN1207** (1204**) A143	C1RC	CM6×30B	WH20L WH40L	S12CC-07 (S12CC-04)	SM3×10B	SPR1
	2525M12	○	○	25	25	170	25	32	25							
	3225P12	○	○	32	25	170	32	32	25							
	3225P15	○	○	32	25	170	32	32	30	SNGN1507** A143	C2RC	CM8×30B	WH30L WH50L	S15CC-07	SM4×12B	SPR3

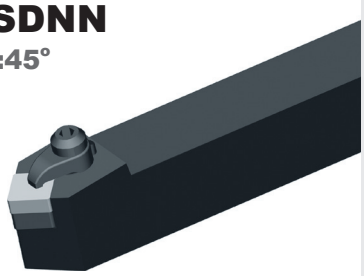
● ex stock · ab Lager ○ on demand · Anfrage

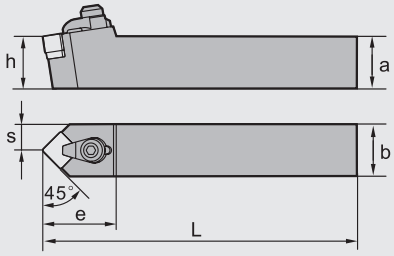
SN** Toolholder · Halter

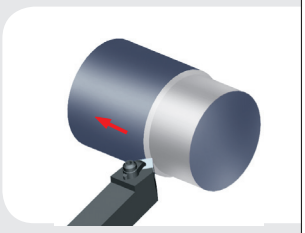
C-Clamping · C-Halter

CSDNN

Kr:45°





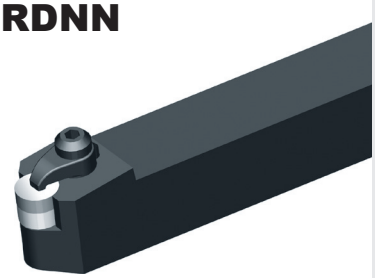


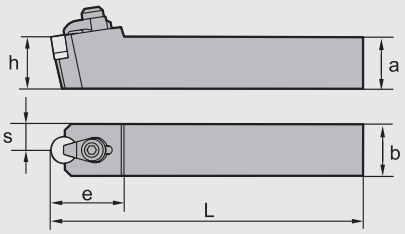
Type · Typ		Stock Lager	Dimension (mm) Abmessung						Application inserts Wendeschneid-platten	Clamp Pratze	Clamp screw Schraube	Wrench Schlüssel	Shim Unterlage	Shim screw Schraube	Spring Feder
			a	b	L	h	s	e							
CSDNN	**2020K12**	○	20	20	125	20	10	35	SNGN1207** (1204**) A143	C1RC	CM6×30B	WH20L WH40L	S12CC-07 (S12CC-04)	SM3×10B	SPR1
	2525M12	○	25	25	150	25	12.5	3○							
	3225P12	○	32	25	170	32	12.5	35							

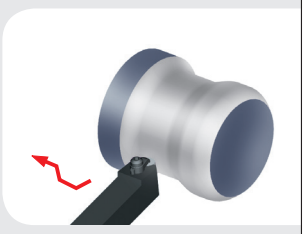
RN** Toolholder · Halter

C-Clamping · C-Halter

CRDNN







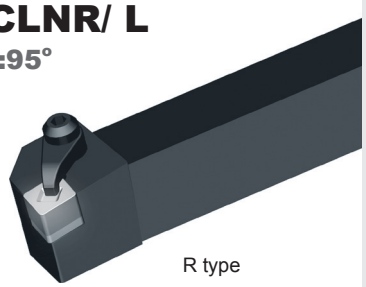
Type · Typ		Stock Lager	Dimension (mm) Abmessung						Application inserts Wendeschneid-platten	Clamp Pratze	Clamp screw Schraube	Wrench Schlüssel	Shim Unterlage	Shim screw Schraube	Spring Feder
			a	b	L	h	s	e							
CRDNN	**2020K12**	○	20	20	125	20	10	32	RNGN1207** (1204**) A146	C1RC	CM6×30B	WH20L WH40L	R12CC-07 (R12CC-04)	SM3×10B	SPR1
	2525M12	○	25	25	150	25	12.5	32							
	3225P12	○	32	25	170	32	12.5	32							
	3232P15	○	32	32	170	32	17.5	40	RNGN1507** A146	C2RC	CM8×30B	WH20L WH50L	R15CC-07	SM3×10B	SPR3
	4040R15	○	40	40	200	40	20	40							

CN** Toolholder · Halter

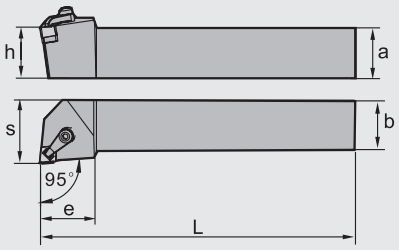
J-Clamping · J-Halter

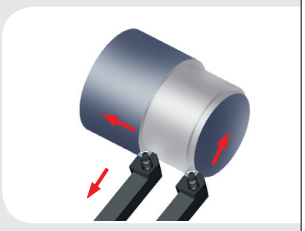
JCLNR/ L

Kr:95°



R type
Rechtsausführung





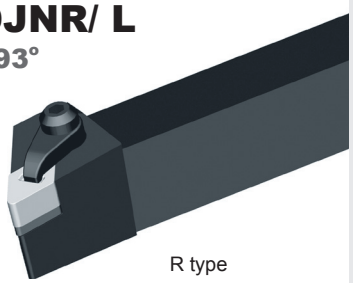
Type · Typ		Stock Lager		Dimension (mm) Abmessung						Application inserts Wendeschneid-platten	Clamp Pratze	Clamp screw Schraube	Wrench Schlüssel	Shim Unterlage	Shim screw Schraube	Spring Feder
		R	L	a	b	L	h	s	e							
JCLNR/ L	**2020K12**	○	○	20	20	125	20	29	32	CNGX1207** A140	C1RJ	CM6×30B	WH20L WH40L	C12CC-07	SM3×10B	SPR1
	2525M12	○	○	25	25	150	25	32	32							

DN** Toolholder · Halter

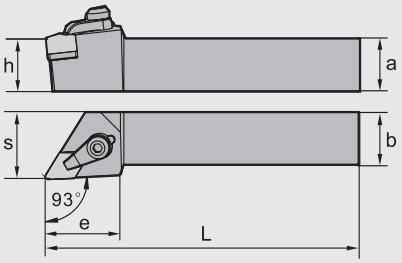
J-Clamping · J-Halter

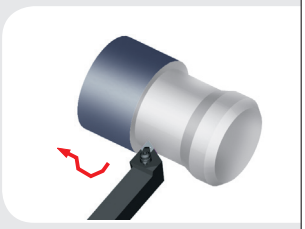
JDJNR/ L

Kr:93°



R type
Rechtsausführung





Type · Typ		Stock Lager		Dimension (mm) Abmessung						Application inserts Wendeschneid-platten	Clamp Pratze	Clamp screw Schraube	Wrench Schlüssel	Shim Unterlage	Shim screw Schraube	Spring Feder
		R	L	a	b	L	h	s	e							
JDJNR/ L	**2525M15**	○	○	25	25	150	25	32	38	DNGX1507** A141	C1RJ	CM6×30B	WH20L WH40L	D15CC-07	SM3×10B	SPR1
	3225P15	○	○	32	25	170	32	32	38							

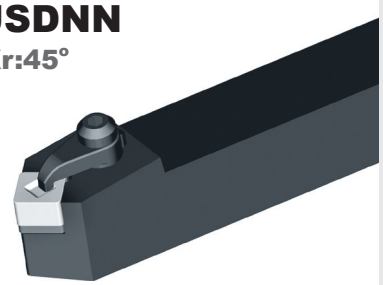
● ex stock · ab Lager ○ on demand · Anfrage

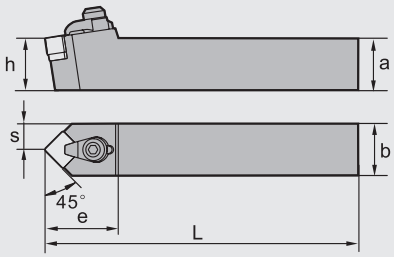
SN** Toolholder · Halter

J-Clamping · J-Halter

JSDNN

Kr:45°







Type · Typ		Stock Lager	Dimension (mm) Abmessung						Application inserts Wendeschneid-platten	Clamp Pratze	Clamp screw Schraube	Wrench Schlüssel	Shim Unterlage	Shim screw Schraube	Spring Feder
			a	b	L	h	s	e							
JSDNN	**2020K12**	○	20	20	125	20	10	40	SNGX1207** A142	C1RJ	CM6×30B	WH20L WH40L	S12CC-07	SM3×10B	SPR1
	2525M12	○	25	25	150	25	12.5	40							
	3225P12	○	32	25	170	32	12.5	40							

NOTIZEN:

Turning · Drehen

Internal Turning Tools · Drehwerkzeuge zur Innenbearbeitung

Turning tool overview · **Drehwerkzeuge Übersicht** **A213**

Turning tool code key · **ISO Kennzeichnung** **A214-A215**

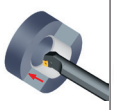
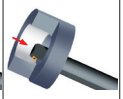
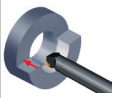
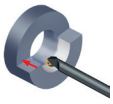
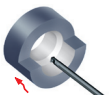
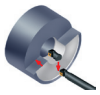
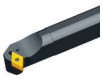
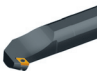
Detailed table of Internal turning tool
Drehwerkzeuge zur Innenbearbeitung **A216-A253**

Turning toolholders by P type clamping · Drehwerkzeuge / P Klemmung A216-A227

Turning toolholders by S type clamping · Drehwerkzeuge / S Klemmung A228-A240

Antivibration Tool Holder · Antivibration-Klemmhalter A241-A248

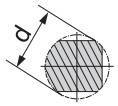


Clamping system Klemmsystem	Feature Merkmale	62°30′	75°	85°	90°	91°	93°	93°	95°	107°30′
										
P	• min. Ø to be machined = 20mm • min. Bearbeitungs Ø = 20mm • neg. inserts with good stability and Economy • Neg. WSP mit guter Stabilität & Wirtschaftlichkeit	PDSN  A218	PSKN  A221		PTFN  A222			PDUN  A219	PCLN  A216	
									PWLN  A223	
S	• min. Ø to be machined = 8,5mm (Screw Clamping) • min. Bearbeitungs Ø = 8,5mm (Schraubenklemm.) • Inserts with 5°/7°/11° • Pos.-WSP mit 5°/7°/11°		SSKC  A229	SDZC  A228	SCFC  A239	STFC  A230	STUP  A238	SDUC  A227		SDQC  A226
								SDUP  A237	SCLC  A224	SDQP  A236
								SVUC  A232	SCLC  A240	SVQB  A233
								SVUB  A234	SCLP  A235	SVQC  A231
Antivibration	• Antivibrations toolholder (Cemented Carbide) • min. Ø to be machined = 8,5mm • Inserts with 5°/7°/11° • Antivibrations-Klemmhalter (Hartmetall) • min. Bearbeitungs Ø = 8,5mm • WSP mit 5°/7°/11°						STUP  A245	SDUP  A244	SCLP  A242	SDQP  A243
								SVUC  A248		SVQC  A247

Type of Shank *Schaftausführung*

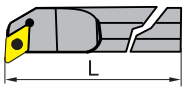
code	Type/Typ
A	Steel shank+Oil hole Stahlschaft mit Kühlbohrung
C	Carbide shank Hartmetallschaft
E	Carbide shank+Oil hole Hartmetallschaft mit Kühlbohrung
S	Steel shank Stahlschaft
X	Special insert application Besondere Anwendung

Shank diameter *Schaftdurchmesser*



code	diameter
16	16
20	20
25	25
32	32
40	40
50	50

Tool length *Halterlänge*

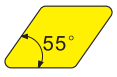


code	length
H	100
K	125
M	150
N	160
Q	180
R	200
S	250
T	300
U	350
V	400

Clamping System *Klemmsystem*

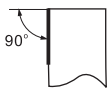
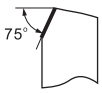
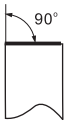
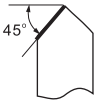
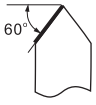
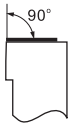
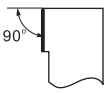
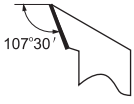
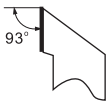
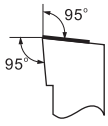
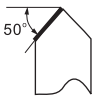
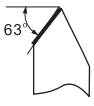
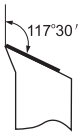
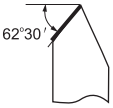
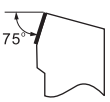
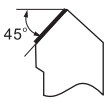
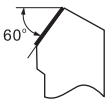
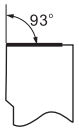
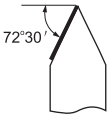
P	
M	 Screw clamping Schraub Spannsystem
S	 Wedge lock clamping *Pratzenkeilklemmung*
C	 Overhead clamping *Pratzenklemmung*

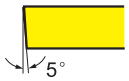
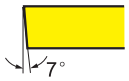
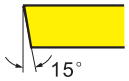
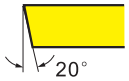
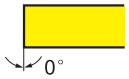
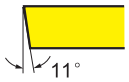
Insert shape *Plattenform*

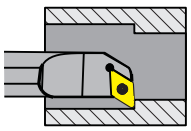
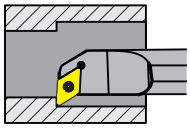
 C	 D
 R	 S
 T	 V
 W	

S 16 R - S D U

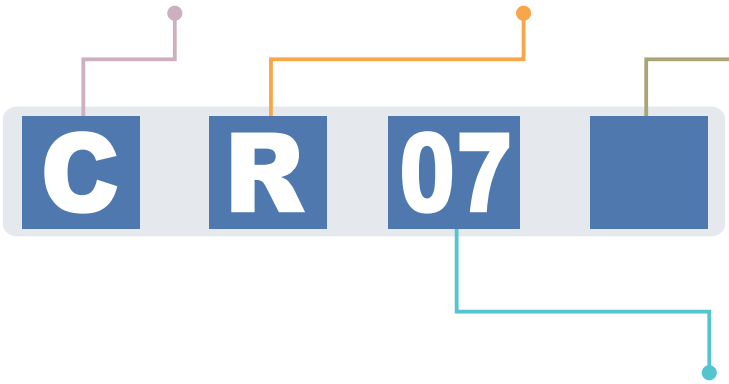
Holder style and lead angle *Halterform und Anstellwinkel*

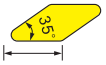
A	B	C	D	E	F	G	H
							
J	**K**	**L**	**M**	**N**	**O**	**P**	**Q**
							
R	**S**	**T**	**U**	**V**	**W**	**X**	
							

Clearance angle of major cutting edge *Freiwinkel von Hauptschneide*	
	B
	C
	D
	E
	N
	P

Holder execution Halterausführung	
	L
	R

Manufacture option Herstellungsoptionen	
D	Increase offset f size+1.0mm Aufmaß von F +1mm erhöhen
E	Increase offset f size+2.0mm Aufmaß von F +2mm erhöhen
R	Round shank Rundschaft
W	Wedge clamping Keil Klemmung
X	Back boring Rückwärts drehen



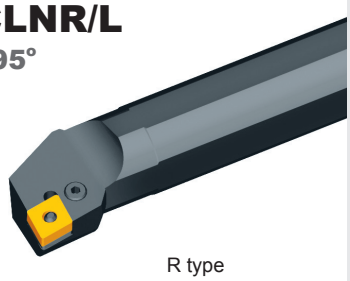
Cutting edge length Schneidkantenlänge							
insert shape	C	D	R	S	T	V	W
							
Diameter of incircle (mm)	Cutting edge length Schneidkantenlänge						
5.556	---	---	---	---	09	---	---
6.350	06	07	---	---	11	---	---
9.525	09	11	09	09	16	16	06
12.700	12	15	12	12	22	22	08
15.875	16	19	15	15	27	---	---
19.050	19	---	19	19	33	---	---
25.400	25	---	25	25	44	---	---

CN** Toolholder · Halter

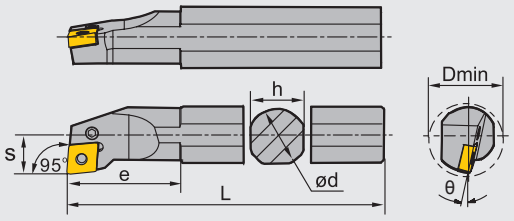
P-Clamping / P-Halter

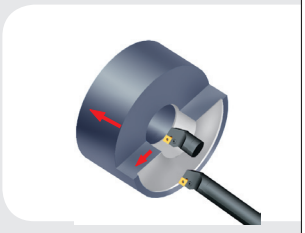
PCLNR/L

Kr:95°



R type
Rechtsausführung





Type · Typ	Stock Lager		Dimension (mm) Abmessung							Screw Schraube	Wrench Schlüssel	Lever Kniehebel	Shim Unterlage	Shim pin Rohrstift
	R	L	Dmin	ød	h	L	S	θ	e					
S16M-PCLNR/L09	●	●	20	16	15	150	11	-12°	28	LEM5×9B	WH20L	L3C	——	——
S16R-PCLNR/L09	●	●	20	16	15	200	11	-12°	28					
S20Q-PCLNR/L09	●	●	25	20	18	180	13	-11°	31					
S20S-PCLNR/L09	●	●	25	20	18	250	13	-11°	31					
S25Q-PCLNR/L09	●	●	32	25	23	180	17	-10°	35					
S25T- PCLNR/L09	●	●	32	25	23	300	17	-10°	35					
S25Q-PCLNR/L12	●	●	32	25	23	180	17	-12°	40	LEM6×13.4A	WH25L	L4A	——	——
S25T- PCLNR/L12	●	●	32	25	23	300	17	-12°	40					
S32R-PCLNR/L12	●	●	44	32	30	200	22	-10°	50	LEM8×21	WH30L	L4	C12APB	SP4
S32U-PCLNR/L12	●	●	44	32	30	350	22	-10°	50					
S40S-PCLNR/L12	●	●	54	40	37	250	27	-10°	55					
S40V-PCLNR/L12	●	●	54	40	37	400	27	-10°	55					
S50S-PCLNR/L12	●	●	63	50	47	250	35	-10°	56					
S50W-PCLNR/L12	●	●	63	50	47	450	35	-10°	56					
S50S-PCLNR/L19	●	●	63	50	47	250	35	-10°	63	LEM10×27	WH40L	L6	C19AP	SP6
S50W-PCLNR/L19	●	●	63	50	47	450	35	-10°	63					
♦ A25R-PCLNR/L12	●	●	32	25	24	200	17	-12°	40	LEM6×13.4A	WH25L	L4A	——	——
♦ A32S-PCLNR/L12	●	●	44	32	31	250	22	-10°	50	LEM8×21	WH30L	L4	C12APB	SP4

● ex stock · ab Lager ○ on demand · auf Anfrage ♦ Toolholder with whole for coolant · Klemmhalter mit Kühlmittelbohrung

Applicable insert
Wendeschneidplatten

Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	Roughing Schruppen	Cast iron machining Grauguss Bearbeitung
insert shape Schneidplattenform	**DF**  A46	**PM**  A47	**DR** Double -side  A49	Flat  A51
	WG Wiper inserts  A46	**DM**  A48	**DR** Single-side  A50	
	SF  A46	**EM**  A48	**ER** Double -side  A50	
	EF  A46	**NM**  A49	**ER** Single-side  A50	
	NF  A47			

Type · Typ					
**-PCLNR/L09	CN**0903**	CN**0903**		CN**0903**
**-PCLNR/L12	CN**1204**	CN**1204**	CN**1204**	CN**1204**
**-PCLNR/L19			CN**1906**	CN**1906**

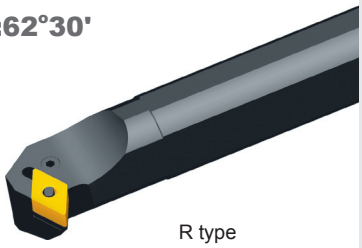
♦ Toolholder with wholes for Coolant · Klemmhalter mit Kühlmittelbohrung ● ex stock · ab Lager ○ on demand · auf Anfrage

CN** Toolholder · Halter

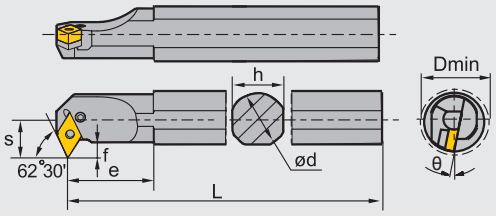
P-Clamping / P-Halter

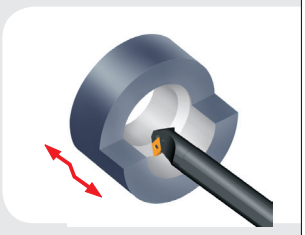
PDSNR/L

Kr:62°30'



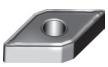
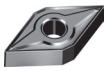
R type
Rechtsausführung





Type · Typ	Stock Lager		Dimension (mm) Abmessung								Screw Schraube	Wrench Schlüssel	Lever Kniehebel	Shim Unterlage	Shim pin Rohrstift
	R	L	Dmin	ød	h	L	S	θ	e	f					
S32R-PDSNR/L15	●	●	40	32	30	200	22	-11°	45	8.5	LEM8×21	WH30L	L4B	D15AP	SP4
S32U-PDSNR/L15	●	●	40	32	30	350	22	-11°	45	8.5					
S32R-PDSNR/L15-3	●	●	40	32	30	200	22	-11°	45	8.5	LEM8×21	WH30L	L4	D15AP	SP4
S32U-PDSNR/L15-3	●	●	40	32	30	350	22	-11°	45	8.5					
S40S-PDSNR/L15	●	●	50	40	37	250	27	-11°	43	9.4	LEM8×21	WH30L	L4B	D15AP	SP4
S40V-PDSNR/L15	●	●	50	40	37	400	27	-11°	43	9.4					
S40S-PDSNR/L15-3	●	●	50	40	37	250	27	-11°	43	9.4	LEM8×21	WH30L	L4	D15AP	SP4
S40V-PDSNR/L15-3	●	●	50	40	37	400	27	-11°	43	9.4					
♦ A32S- PDSNR/L15	●	●	40	32	31	250	22	-11°	45	8.5	LEM8×21	WH30L	L4B	D15AP	SP4
♦ A32S- PDSNR/L15-3	●	●	40	32	31	250	22	-11°	45	8.5	LEM8×21	WH30L	L4	D15AP	SP4

Applicable insert
Wendeschneidplatten

Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	Roughing Schruppen	Cast iron machining Grauguss Bearbeitung
insert shape Schneidplattenform	**DF**  A53	**PM**  A55	**DR** Double -side  A56	Flat  A58
	SF  A53	**DM**  A55	**DR** Single- side  A58	
	EF  A54	**EM**  A56	**ER** Double -side  A58	
	NF  A54	**NM**  A56	**ER** Single- side  A58	

Type · Typ					
	****-PDSNR/L-15-3**	DN**1504**	DN**1504**		DN**1504**
	****-PDSNR/L-15**	DN**1506**	DN**1506**	DN**1506**	DN**1506**

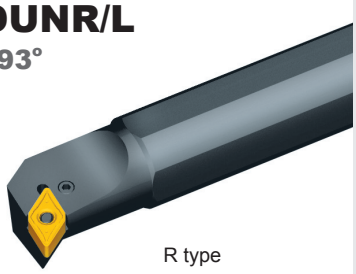
● ex stock · ab Lager ○ on demand · auf Anfrage ♦ Toolholder with whole for coolant · Klemmhalter mit Kühlmittelbohrung

DN** Toolholder · Halter

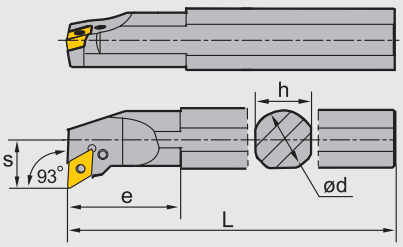
P-Clamping / P-Halter

PDUNR/L

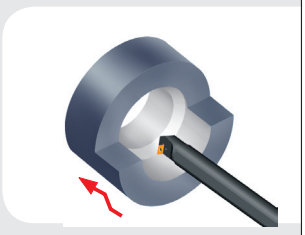
Kr:93°



R type
Rechtsausführung



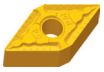
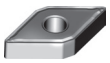
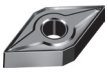
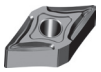
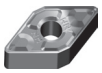




Type · Typ	Stock Lager		Dimension (mm) Abmessung							Screw Schraube	Wrench Schlüssel	Lever Kniehebel	Shim Unterlage	Shim pin Rohrstift
	R	L	Dmin	ød	h	L	S	θ	e					
S20Q-PDUNR/L11	●	●	25	20	18	180	13	-16°	30	LEM5×12B	WH20L	L3D	——	——
S20S-PDUNR/L11	●	●	25	20	18	250	13	-16°	30					
S25Q-PDUNR/L11	●	●	32	25	23	180	17	-13°	35					
S25T-PDUNR/L11	●	●	32	25	23	300	17	-13°	35					
S32R-PDUNR/L11	●	●	40	32	30	200	22	-16°	40	LEM6×17	WH25L	L3	D11AP	SP3
S32U-PDUNR/L11	●	●	40	32	30	350	22	-16°	40					
S32R-PDUNR/L15	●	●	40	32	30	200	22	-16°	50	LEM8×21	WH30L	L4B	D15AP	SP4
S32U-PDUNR/L15	●	●	40	32	30	350	22	-16°	50					
S32R-PDUNR/L15-3	●	●	40	32	30	200	22	-16°	50	LEM8×21	WH30L	L4	D15AP	SP4
S32U-PDUNR/L15-3	●	●	40	32	30	350	22	-16°	50					
S40S-PDUNR/L15	●	●	50	40	37	250	27	-11°	50	LEM8×21	WH30L	L4B	D15AP	SP4
S40V-PDUNR/L15	●	●	50	40	37	400	27	-11°	50					
S40S-PDUNR/L15-3	●	●	50	40	37	250	27	-11°	50	LEM8×21	WH30L	L4	D15AP	SP4
S40V-PDUNR/L15-3	●	●	50	40	37	400	27	-11°	50					
♦ A32S- PDUNR/L15	●	●	40	32	31	250	22	-16°	50	LEM8×21	WH30L	L4B	D15AP	SP4
♦ A32S- PDUNR/L15-3	●	●	40	32	31	250	22	-16°	50	LEM8×21	WH30L	L4	D15AP	SP4

♦ Toolholder with wholes for Coolant · Klemmhalter mit Kühlmittelbohrung ● ex stock · ab Lager ○ on demand · auf Anfrage

Applicable insert
Wendeschneidplatten

Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	Roughing Schruppen	Cast iron machining Grauguss Bearbeitung
insert shape Schneidplattenform	**DF**  A53	**PM**  A55	**DR** Double -side  A56	Flat  A58
	WG Wiper inserts  A53	**DM**  A55	**DR** Single- side  A58	
	SF  A53	**EM**  A56	**ER** Double -side  A58	
	EF  A54	**NM**  A56	**ER** Single- side  A58	
	NF  A54			

Type · Typ				
****-PDUNR/L11**	DN**1104**	DN**1104**		
****-PDUNR/L15-3**	DN**1504**	DN**1504**		DN**1504**
****-PDUNR/L15**	DN**1506**	DN**1506**	DN**1506**	DN**1506**

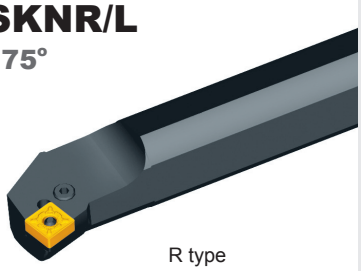
● ex stock · ab Lager ○ on demand · auf Anfrage ♦ Toolholder with whole for coolant · Klemmhalter mit Kühlmittelbohrung

SN** Toolholder · Halter

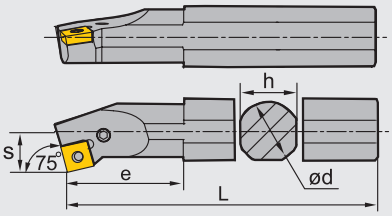
P-Clamping / P-Halter

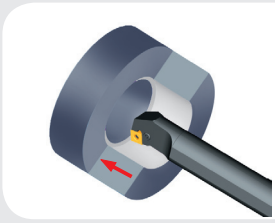
PSKNR/L

Kr:75°



R type
Rechtsausführung





Type · Typ	Stock Lager		Dimension (mm) Abmessung							Screw Schraube	Wrench Schlüssel	Lever Kniehebel	Shim Unterlage	Shim pin Rohrstift
	R	L	Dmin	ød	h	L	S	θ	e					
S25Q-PSKNR/L12			32	25	23	180	17	-12°	42	LEM6×13.4A	WH25L	L4A	——	——
S25T-PSKNR/L12	●	●	32	25	23	300	17	-12°	42					
S32R-PSKNR/L12	●	●	44	32	30	200	22	-10°	45	LEM8×21	WH30L	L4	S12APB	SP4
S32U-PSKNR/L12	●	●	44	32	30	350	22	-10°	45					
S40S-PSKNR/L12	●	●	54	40	37	250	27	-10°	50					
S40V-PSKNR/L12	●	●	54	40	37	400	27	-10°	50					
♦ A25R-PSKNR/L12	●	●	32	25	24	200	17	-12°	42	LEM6×13.4A	WH25L	L4A	——	——
♦ A32S-PSKNR/L12	●	●	44	32	31	250	22	-12°	50	LEM8×21	WH30L	L4	S12APB	SP4

Applicable insert Wendeschneidplatten

Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	Roughing Schruppen	Heavy Duty Schwerzerspanung	Cast iron machining Grauguss Bearbeit.
insert shape Schneidplattenform	**SF**  A60	**DF**  A59	**PM**  A60	**DR** Double-side  A62	Flat  A65
		EF  A59	**DM**  A61	**DR** Single-side  A62	
			EM  A61	**ER** Double-side  A63	
			NM  A62	**ER** Single-side  A63	
Type · Typ **-PSKNR/L12	SN**1204**	SN**1204**	SN**1204**	SN**1204**	SN**1204**

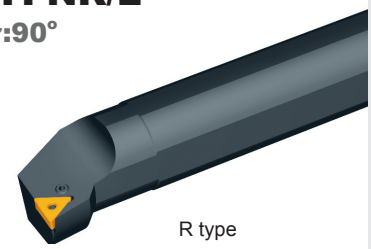
♦ Toolholder with wholes for Coolant · Klemmhalter mit Kühlmittelbohrung ● ex stock · ab Lager ○ on demand · auf Anfrage

TN** Toolholder · Halter

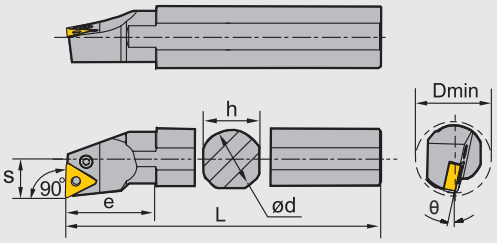
P-Clamping / P-Halter

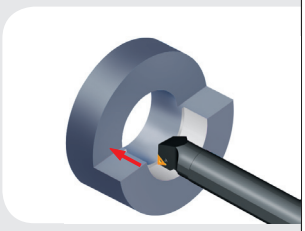
PTFNR/L

Kr:90°



R type
Rechtsausführung





Type · Typ	Stock Lager		Dimension (mm) Abmessung							Screw Schraube	Wrench Schlüssel	Lever Kniehebel	Shim Unterlage	Shim pin Rohrstift
	R	L	Dmin	ød	h	L	S	θ	e					
S16M-PTFNR/L11	●	●	20	16	15	150	11	-14°	28	LEM5×9B	WH20L	L2	——	——
S16R-PTFNR/L11	●	●	20	16	15	200	11	-14°	28					
S20Q-PTFNR/L11			25	20	18	180	13	-12°	31					
S20S-PTFNR/L11	●	●	25	20	18	250	13	-12°	31					
S25Q-PTFNR/L11			32	25	23	180	17	-10°	35					
S25T-PTFNR/L11	●	●	32	25	23	300	17	-10°	35					
S25Q-PTFNR/L16			32	25	23	180	17	-12°	42	LEM5×12B	WH20L	L3B	——	——
S25T-PTFNR/L16	●	●	32	25	23	300	17	-12°	42					
S32R-PTFNR/L16			44	32	30	200	22	-10°	50	LEM6×17	WH25L	L3	T16APB	SP3
S32U-PTFNR/L16	●	●	44	32	30	350	22	-10°	50					
S40S-PTFNR/L16			54	40	37	250	27	-10°	55					
S40V-PTFNR/L16	●	●	54	40	37	400	27	-10°	55					
♦ A25R-PTFNR/L16			32	25	24	200	17	-12°	40					
♦ A32S-PTFNR/L16	●	●	44	32	31	250	22	-10°	50					

Applicable insert Wendeschneidplatten

Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	Roughing Schruppen	Cast iron machining Grauguss Bearbeitung
insert shape Schneidplattenform	**DF**  A68	**PM**  A69	**DR** Double -side  A70	Flat  A73
	WG Wiper inserts  A68	**DM**  A69	**DR** Single-side  A71	
	SF  A68	**EM**  A70	**ER** Double -side  A71	
	EF  A68			
Type · Typ **PTFNR/L11	TN**1103**	TN**1103**		TN**1103**
**PTFNR/L16	TN**1604**	TN**1604**	TN**1604**	TN**1604**

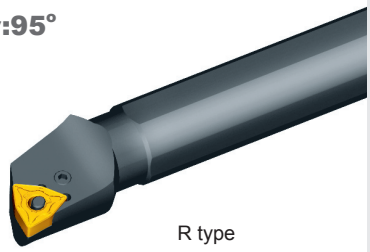
● ex stock · ab Lager ○ on demand · auf Anfrage ♦ Toolholder with whole for coolant · Klemmhalter mit Kühlmittelbohrung

WN** Toolholder · Halter

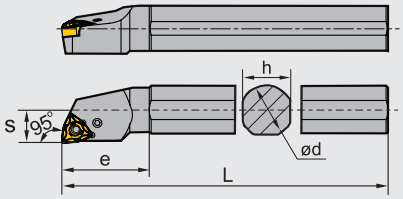
P-Clamping / P-Halter

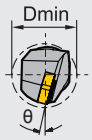
PWLNR/L

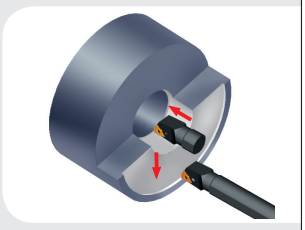
Kr:95°



R type
Rechtsausführung







Type · Typ	Stock Lager		Dimension (mm) Abmessung							Screw Schraube	Wrench Schlüssel	Lever Kniehebel	Shim Unterlage	Shim pin Rohrstift
	R	L	Dmin	ød	h	L	S	θ	e					
S16M-PWLNR/L06	●	●	20	16	15	150	11	-13°	25	LEM5X12B	WH20L	L3B	—	—
S16R-PWLNR/L06			20	16	15	200	11	-13°	25					
S20Q-PWLNR/L06	●	●	25	20	18	180	13	-13°	35	LEM5X12B	WH20L	L3B	—	—
S20S-PWLNR/L06			25	20	18	250	13	-13°	35					
S25Q-PWLNR/L06	●	●	32	25	23	180	17	-13°	35					
S25T-PWLNR/L06			32	25	23	300	17	-13°	35					
S20Q-PWLNR/L08	●	●	25	20	18	180	13	-13°	32	LEM6X13.4A	WH25L	L4A	—	—
S20S-PWLNR/L08			25	20	18	250	13	-13°	32					
S25Q-PWLNR/L08		●	32	25	23	180	17	-13°	45					
S25T-PWLNR/L08			32	25	23	300	17	-13°	45					
S32R-PWLNR/L08	●	●	40	32	30	200	22	-15°	50	LEM8X21	WH30L	L4	W08AP	SP4
S32U-PWLNR/L08	●	●	40	32	30	350	22	-15°	50					
♦ A25T-PWLNR/L08			32	25	23	300	17	-13°	45	LEM6X13.4A	WH25L	L4A	—	—
♦ A32R-PWLNR/L08			40	32	30	200	22	-15°	50	LEM8X21	WH30L	L4	W08AP	SP4

Applicable insert Wendeschneidplatten

Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	Roughing Schruppen	Cast iron machining Grauguss Bearbeitung
insert shape Schneidplattenform	**DF**  A76	**PM**  A78	**DR** Double -side  A79	Flat  A79
	WG Wiper inserts  A76	**DM**  A78		
	SF  A77	**EM**  A78		
	EF  A77	**NM**  A79		
	NF  A77			

Type · Typ					
	****-PWLNR/L06**	WN**0604**	WN**0604**	WN**0604**	WN**0604**
	****-PWLNR/L08**	WN**0804**	WN**0804**	WN**0804**	WN**0804**

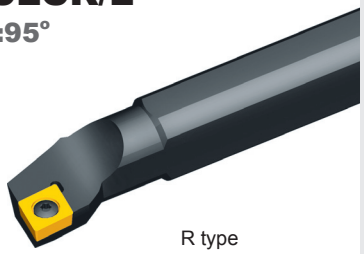
♦ Toolholder with wholes for Coolant · Klemmhalter mit Kühlmittelbohrung ● ex stock · ab Lager ○ on demand · auf Anfrage

CC** Toolholder · Halter

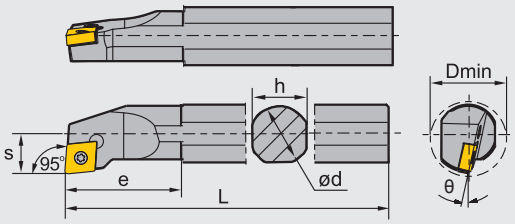
S-Clamping / S-Halter

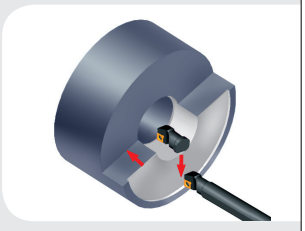
SCLCR/L

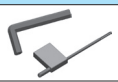
Kr:95°



R type
Rechtsausführung





Type · Typ	Stock Lager		Dimension (mm) Abmessung							Screw Schraube	Wrench Schlüssel	Shim Unterlage	Shim Screw, Unterlage Schraube
	R	L	Dmin	ød	h	L	S	θ	e				
S08K-SCLCR/L06	●	●	10	8	7	125	5	-15°	14	I60M2.5×5.5	WT07IP	——	——
S10M-SCLCR/L06	●	●	12	10	9	150	6	-13°	14				
S12M-SCLCR/L06	●	●	16	12	11	150	9	-10°	25				
S12M-SCLCR/L09	●	●	16	12	11	150	9	-10°	25	I60M3.5×8	WT15IP	——	——
S16M-SCLCR/L09	●	●	20	16	15	150	11	-12°	32.5				
S16R-SCLCR/L09	●	●	20	16	15	200	11	-12°	32.5				
S20Q-SCLCR/L09	●	●	25	20	18	180	13	-8°	38				
S20S-SCLCR/L09	●	●	25	20	18	250	13	-8°	38				
S25Q-SCLCR/L09	●	●	32	25	23	180	17	-6°	45	I60M3.5×10	WT15IP	——	——
S25T-SCLCR/L09	●	●	32	25	23	300	17	-6°	45				
S25Q-SCLCR/L12	●	●	32	25	23	180	17	-6°	45	I60M4×11X	WH40L,WT15IP	C12BS	SM6×10XA
S25T-SCLCR/L12	●	●	32	25	23	300	17	-6°	45	I60M4×11X	WT15IP	——	——
S32R-SCLCR/L12	●	●	40	32	30	200	22	-10°	50	I60M4×11X	WH40L WT15IP	C12BS	SM6×10XA
S32U-SCLCR/L12	●	●	40	32	30	350	22	-10°	50				
S40S-SCLCR/L12	●	●	50	40	37	250	27	-8°	60				
S40V-SCLCR/L12	●	●	50	40	37	400	27	-8°	60				
♦ A08F-SCLCR/L06	●	●	10	8	7.5	80	5	-15°	14	I60M2.5×5.5	WT07IP	——	——
♦ 10H-SCLCR/L06	●	●	12	10	9.5	100	6	-13°	14				
♦ A12K-SCLCR/L06	●	●	16	12	11.5	125	9	-10°	25				
♦ A12K-SCLCR/L09	●	●	16	12	11.5	125	9	-10°	25	I60M3.5×8	WT15IP	——	——
♦ A16M-SCLCR/L09	●	●	20	16	15.5	150	11	-12°	32.5				
♦ A20Q-SCLCR/L09	●	●	25	20	19	180	13	-8°	38				
♦ A25R-SCLCR/L09	●	●	32	25	24	200	17	-6°	45	I60M3.5×10			
♦ A25R-SCLCR/L12	●	●	32	25	24	200	17	-6°	45	I60M4×11X	WT15IP	——	——
♦ A32S-SCLCR/L12	●	●	40	32	31	250	22	-10°	50		WH40L,WT15IP	C12BS	SM6×10XA
AH08K-SCLCR/L06	○	○	10	8	7	125	5	13	20	I60M2.5×5.5	WT07IP	——	——
AH10K-SCLCR/L06	○	○	12	10	9	125	6	12	20				
AH12M-SCLCR/L06	○	○	14	12	11	150	7	12	20				
AH16Q-SCLCR/L09	○	○	18	16	14	180	11	8	27	I60M3.5×8	WT15IP		
AH20R-SCLCR/L09	○	○	23	20	18	200	13	7	27				
AH25R-SCLCR/L12	○	○	28	25	23	200	15.5	7	40	I60M4×11X		C12BS	SM6×10XA

● ex stock · ab Lager ○ on demand · auf Anfrage ♦ Toolholder with whole for coolant · Klemmhalter mit Kühlmittelbohrung

Applicable insert
Wendeschneidplatten

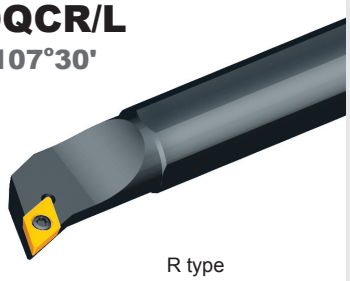
Application Anwendung	Extra Finishing Feinbearbeitung	Finishing Schlichten	Semi-finishing Mittlere Bearbeit.	Roughing Schruppen	Al machining Alu Bearbeitung	Cast iron machining Grauguss Bearbeit.
insert shape Schneidplattenform	**SF**  A84	**HF**  A84	**HM**  A85	**HR**  A86	**LH**  A86	Flat  A86
		EF  A85	**EM**  A85			
Type · Typ						
**-SCLCR/L06	CC**0602**	CC**0602**	CC**0602**	CC**0602**	CCGX0602**	CC**0602**
**-SCLCR/L09	CC**09T3**	CC**09T3**	CC**09T3**	CC**09T3**	CCGX09T3**	CC**09T3**
**-SCLCR/L12	CC**1204**	CC**1204**	CC**1204**	CC**1204**	CCGX1204**	CC**1204**

♦ Toolholder with wholes for Coolant · Klemmhalter mit Kühlmittelbohrung ● ex stock · ab Lager ○ on demand · auf Anfrage

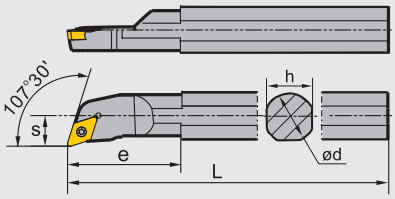
DC** Toolholder · Halter

S-Clamping / S-Halter

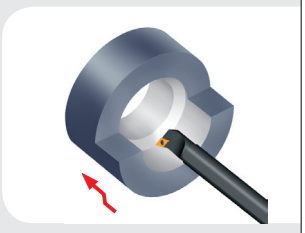
SDQCR/L
Kr:107°30'



R type
Rechtsausführung

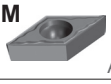






Type · Typ	Stock Lager		Dimension (mm) Abmessung							Screw Schraube	Wrench Schlüssel		
	R	L	Dmin	ød	h	L	S	θ	e				
S10M-SDQCR/L07	●	●	13	10	9	150	7	-8°	20	I60M2.5×5.5	WT07IP		
S12M-SDQCR/L07	●	●	16	12	11	150	9	-8°	22	I60M2.5×6.5			
S16M-SDQCR/L07	●	●	20	16	15	150	11	-6°	27				
S16R-SDQCR/L07	●	●	20	16	15	200	11	-6°	27				
S20Q-SDQCR/L11	●	●	25	20	18	180	13	-6°	32	I60M3.5×8	WT15IP		
S20S-SDQCR/L11	●	●	25	20	18	250	13	-6°	32				
S25Q-SDQCR/L11	●	●	32	25	23	180	17	-6°	32	I60M3.5×10			
S25T-SDQCR/L11	●	●	32	25	23	300	17	-6°	32				
♦ A10H-SDQCR/L07	●	●	13	10	9.5	100	7	-8°	20	I60M2.5×5.5	WT07IP		
♦ A12K-SDQCR/L07	●	●	16	12	11.5	125	9	-8°	22	I60M2.5×6.5			
♦ A16M-SDQCR/L11	●	●	20	16	15.5	150	11	-6°	27	I60M3.5×8	WT15IP		
♦ A20Q-SDQCR/L11	●	●	25	20	19	180	13	-6°	32				
♦ A25R-SDQCR/L11	●	●	32	25	24	200	17	-6°	32	I60M3.5×10			
AH10K-SDQCR/L07	○	○	13	10	9	125	8	10	20	I60M2.5×6.5	WT07IP		
AH12M-SDQCR/L07	○	○	16	12	11	150	9.5	8	20				
AH16Q-SDQCR/L07	○	○	20	16	14	180	12	6	30				
AH20R-SDQCR/L11	○	○	25	20	18	200	14.5	6	40	I60M3.5×8	WT15IP		
AH25R-SDQCR/L11	○	○	32	25	23	200	17	6	40				

Applicable insert Wendeschneidplatten

Application Anwendung	Extra Finishing Feinbearbeitung	Finishing Schlichten	Semi-finishing Mittlere Bearbeit.	Roughing Schruppen	Al machining Alu Bearbeitung	Cast iron machining Grauguss Bearbeit.
insert shape Schneidplattenform	**SF**  A88	**HF**  A88	**HM**  A89	**HR**  A90	**LH**  A90	Flat  A90
		EF  A89	**EM**  A89			
Type · Typ **-SDQCR/L07	DC**0702**	DC**0702**	DC**0702**		DCGX0702**	DC**0702**
Type · Typ **-SDQCR/L11	DC**11T3**	DC**11T3**	DC**11T3**	DC**11T3**	DCGX11T3**	DC**11T3**

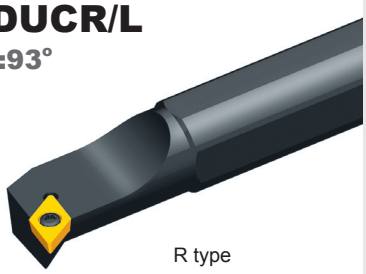
● ex stock · ab Lager ○ on demand · auf Anfrage ♦ Toolholder with whole for coolant · Klemmhalter mit Kühlmittelbohrung

DC** Toolholder · Halter

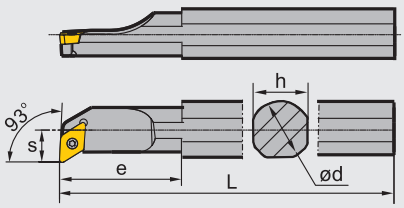
S-Clamping / S-Halter

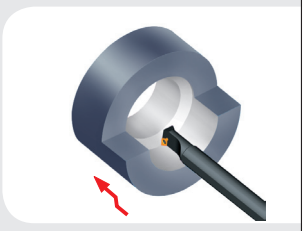
SDUCR/L

Kr:93°



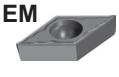
R type
Rechtsausführung





Type · Typ	Stock Lager		Dimension (mm) Abmessung							Screw Schraube	Wrench Schlüssel		
	R	L	Dmin	ød	h	L	S	θ	e				
S10M-SDUCR/L07	●	●	13	10	9	150	7	-8°	0	I60M2.5×5.5	WT07IP		
S12M-SDUCR/L07	●	●	16	12	11	150	9	-8°	22	I60M2.5×6.5			
S16M-SDUCR/L07	●	●	20	16	15	150	11	-6°	27				
S16R-SDUCR/L07	●	●	20	16	15	200	11	-6°	27				
S20Q-SDUCR/L11	●	●	25	20	18	180	13	-6°	40	I60M3.5×8	WT15IP		
S20S-SDUCR/L11	●	●	25	20	18	250	13	-6°	40				
S25Q-SDUCR/L11	●	●	32	25	23	180	17	-6°	46	I60M3.5×10			
S25T-SDUCR/L11	●	●	32	25	23	300	17	-6°	46				
♦ A10H-SDUCR/L07	●	●	13	10	9.5	100	7	-8°	0	I60M2.5×5.5	WT07IP		
♦ A12K-SDUCR/L07	●	●	16	12	11.5	125	9	-8°	22	I60M2.5×6.5			
♦ A16M-SDUCR/L07	●	●	20	16	15.5	150	11	-6°	27				
♦ A20Q-SDUCR/L11	●	●	25	20	19	180	13	-6°	40	I60M3.5×8	WT15IP		
♦ A25R-SDUCR/L11	●	●	32	25	24	200	17	-6°	46	I60M3.5×10			
AH10K-SDUCR/L07	○	○	14	10	9	125	8.3	-8	20	I60M2.5×6.5	WT07IP		
AH12M-SDUCR/L07	○	○	16	12	11	150	9.3	-8	25				
AH16Q-SDUCR/L07	○	○	20	16	14	180	11.3	-6	25				
AH20R-SDUCR/L11	○	○	26	20	18	200	16.1	-6	30	I60M3.5×8	WT15IP		
AH25R-SDUCR/L11	○	○	32	25	23	200	18.6	5	40				

Applicable insert Wendeschneidplatten

Application Anwendung	Extra Finishing Feinbearbeitung	Finishing Schlichten	Semi-finishing Mittlere Bearbeit.	Roughing Schruppen	Al machining Alu Bearbeitung	Cast iron machining Grauguss Bearbeit.
insert shape Schneidplattenform	**SF**  A88	**HF**  A88	**HM**  A89	**HR**  A90	**LH**  A90	Flat  A90
		EF  A89	**EM**  A89			
Type · Typ **-SDUCR/L07	DC**0702**	DC**0702**	DC**0702**		DCGX0702**	DC**0702**
**-SDUCR/L11	DC**11T3**	DC**11T3**	DC**11T3**	DC**11T3**	DCGX11T3**	DC**11T3**

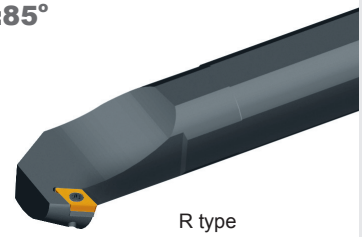
♦ Toolholder with wholes for Coolant · Klemmhalter mit Kühlmittelbohrung ● ex stock · ab Lager ○ on demand · auf Anfrage

DC** Toolholder · Halter

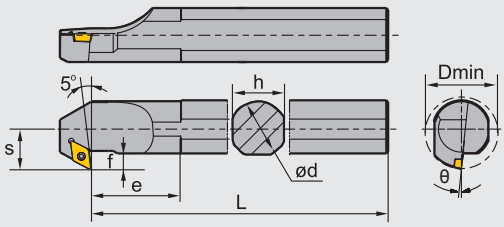
S-Clamping / S-Halter

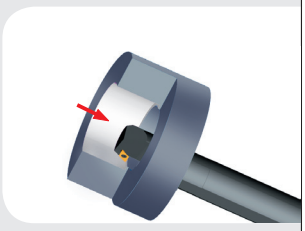
SDZCR/L

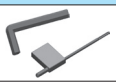
Kr:85°



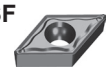
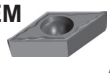
R type
Rechtsausführung





Type · Typ	Stock Lager		Dimension (mm) Abmessung								Screw Schraube	Wrench Schlüssel	Shim Unterlage	Shim/ Screw Schraube Unterlage
	R	L	Dmin	ød	h	L	S	θ	e	f				
S25Q-SDZCR/L11	●	●	32	25	23	180	17	-6°	30	6.9	I60M3.5×10	WT15IP		
S25T-SDZCR/L11	●	●	32	25	23	300	17	-6°	30	6.9				
S32R-SDZCR/L11	●	●	40	32	30	200	22	-6°	.39	8.4	I60M3.5×12	WT15IP WH35L	D11BS	SM5×8.65XA
S32U-SDZCR/L11	●	●	40	32	30	350	22	-6°	.39	8.4				
S40S-SDZCR/L11	●	●	50	40	37	250	27	-4°	47	9.4				
S40V-SDZCR/L11	●	●	50	40	37	400	27	-4°	47	9.4				
♦ A25R-SDZCR/L11	●	●	32	25	24	200	17	-6°	30	4.5	I60M3.5×10	WT15IP		
♦ A32S-SDZCR/L11	●	●	40	32	31	250	22	-6°	39	6.0	I60M3.5×12	WT15IP WH35L	D11BS	SM5×8.65XA

Applicable insert
Wendeschneidplatten

Application Anwendung	Extra Finishing Feinbearbeitung	Finishing Schlichten	Semi-finishing Mittlere Bearbeit.	Roughing Schruppen	Al machining Alu Bearbeitung	Cast iron machining Grauguss Bearbeit.
insert shape Schneidplattenform	**SF**  A88	**HF**  A88	**HM**  A89	**HR**  A90	**LH**  A90	 A90
		EF  A89	**EM**  A89			
Type · Typ **-SDZCR/L11	DC**11T3**	DC**11T3**	DC**11T3**	DC**11T3**	DCGX11T3**	DC**11T3**

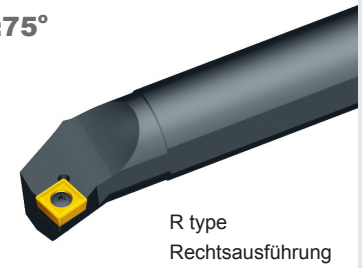
● ex stock · ab Lager ○ on demand · auf Anfrage ♦ Toolholder with whole for coolant · Klemmhalter mit Kühlmittelbohrung

SC** Toolholder · Halter

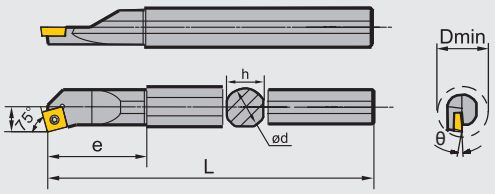
S-Clamping / S-Halter

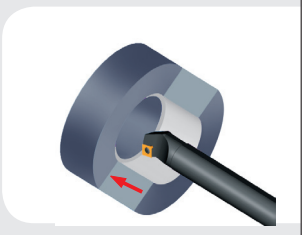
SSKCR/L

Kr:75°



R type
Rechtsausführung





Type · Typ	Stock Lager		Dimension (mm) Abmessung							Screw Schraube	Wrench Schlüssel	Shim Unterlage	Shim/ Screw Schraube Unterlage
	R	L	Dmin	ød	h	L	S	θ	e				
S12M- SSKCR/L09	●	●	16	12	11	150	9	-10	26	I60M3.5×8	WT15IP		
S16M- SSKCR/L09	●	●	20	16	15	150	11	-11	32.5				
S16R- SSKCR/L09	●	●	20	16	15	200	11	-11	32.5				
S20Q- SSKCR/L09	●	●	25	20	18	180	13	-6	34.5				
S20S- SSKCR/L09	●		25	20	18	250	13	-6	34.5				
S25Q- SSKCR/L12	●	●	32	25	23	180	17	-8	36.3	I60M4×11X	WT15IP		
S25T- SSKCR/L12	●	●	32	25	23	300	17	-8	36.3				
S32R- SSKCR/L12	●	●	40	32	30	200	22	-10	43.5		WT15IP WH40L	S12BS	SM6×10XA
S32U- SSKCR/L12	●		40	32	30	350	22	-10	43.5				
♦ A12K- SSKCR/L09	●		16	12	11	125	9	-10	26	I60M3.5×8	WT15IP		
♦ A16M- SSKCR/L09	●		20	16	15	150	11	-11	32.5				
♦ A20Q- SSKCR/L09	●		25	20	19	180	13	-6	34.5				
♦ A25R- SSKCR/L12	●	●	32	25	24	200	17	-8	41.3	I60M4×11X	WT15IP		
♦ A32S- SSKCR/L12	●		40	32	31	250	22	-10	42.8		WT15IP WH40L	S12BS	SM6×10XA

Applicable insert
Wendeschneidplatten

Application Anwendung	Finishing Schlichten	Semi-finishing Mittlere Bearbeit.	Roughing Schruppen	Al machining Alu Bearbeitung	Cast iron machining Grauguss Bearbeit.
insert shape Schneidplattenform	**HF**  A94	**HM**  A94	**HR**  A95	**LH**  A95	Flat  A95
	EF  A94	**EM**  A94			
Type · Typ **-SSKCR/L09	SC**09T3**	SC**09T3**	SC**09T3**	SCGX09T3**	SC**09T3**
**-SSKCR/L12		SC**1204**	SC**1204**	SCGX1204**	SC**1204**

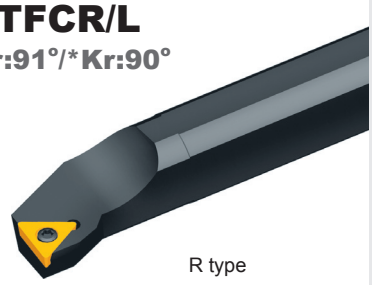
♦ Toolholder with wholes for Coolant · Klemmhalter mit Kühlmittelbohrung ● ex stock · ab Lager ○ on demand · auf Anfrage

TC** Toolholder · Halter

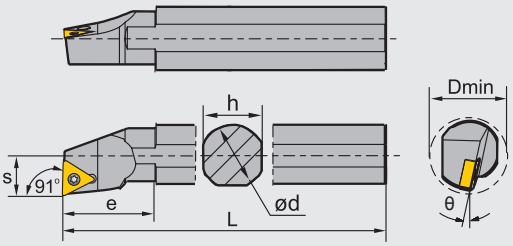
S-Clamping / S-Halter

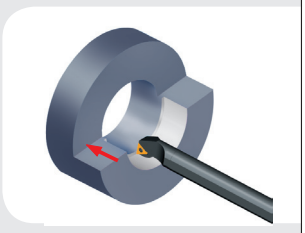
STFCR/L

Kr:91°/*Kr:90°



R type
Rechtsausführung





Type · Typ	Stock Lager		Dimension (mm) Abmessung							Screw Schraube	Wrench Schlüssel	Shim Unterlage	Shim/ Screw Schraube Unterlage
	R	L	Dmin	ød	h	L	S	θ	e				
S12M-STFCR/L11	●	●	16	12	11	150	9	-10°	30	I60M2.5×6.5	WT07IP		
S16M-STFCR/L11	●	●	20	16	15	150	11	-6°	35				
S16R-STFCR/L11	●	●	20	16	15	200	11	-6°	35				
S20Q-STFCR/L11	●	●	25	20	18	180	13	-3°	36				
S20S-STFCR/L11	●	●	25	20	18	250	13	-3°	36				
S25Q-STFCR/L16	●	●	32	25	23	180	17	-6°	49	I60M3.5×10	WT15IP		
S25T-STFCR/L16	●	●	32	25	23	300	17	-6°	49				
S32R-STFCR/L16	●	●	40	32	30	200	22	-10°	50	I60M3.5×12	WT15IP WH35L	T16BS	SM5×8.65XA
S32U-STFCR/L16	●	●	40	32	30	350	22	-10°	50				
S40S-STFCR/L16	●	●	50	40	37	250	27	-8°	60				
S40V-STFCR/L16	●	●	50	40	37	400	27	-8°	60				
♦ A12K-STFCR/L11	●	●	16	12	11.5	125	9	-10°	26	I60M2.5×6.5	WT07IP		
♦ A16M-STFCR/L11	●	●	20	16	15.5	150	11	-6°	30				
♦ A20Q-STFCR/L11	●	●	25	20	19	180	13	-3°	36				
♦ A25R-STFCR/L16	●	●	32	25	24	200	17	-6°	45	I60M3.5×10	WT15IP		
♦ A32S-STFCR/L16	●	●	40	32	31	250	22	-10°	49	I60M3.5×12	WT15IP	T16BS	SM5×8.65XA
***AH10K-STFCR/L11**	○	○	12	10	9	125	7	12	16	I60M2.5×6.5	WT07IP		
***AH12M-STFCR/L11**	○	○	14	12	11	150	9	10	20				
***AH16Q-STFCR/L11**	○	○	18	16	14	180	11	8	25				
***AH20R-STFCR/L11**	○	○	23	20	18	200	13	7	32				
***AH25R-STFCR/L16**	○	○	28	25	23	200	17	5	40	I60M3.5×12	WT15IP		

Applicable insert
Wendeschneidplatten

Application Anwendung	Extra Finishing Feinbearbeitung	Finishing Schlichten	Semi-finishing Mittlere Bearbeit.	Roughing Schruppen	Al machining Alu Bearbeitung	Cast iron machining Grauguss Bearbeit.
insert shape Schneidplattenform	**SF**  A98	**HF**  A99	**HM**  A101	**HR**  A101	**LH**  A101	 A102
		EF  A100	**EM**  A100			
Type · Typ **-STFCR/L11	TC**1102**	TC**1102**	TC**1102**	TC**1102**	TCGX1102**	TC**1102**
**-STFCR/L16	TC**16T3**	TC**16T3**	TC**16T3**	TC**16T3**	TCGX16T3**	TC**16T3**

● ex stock · ab Lager ○ on demand · auf Anfrage ♦ Toolholder with whole for coolant · Klemmhalter mit Kühlmittelbohrung

VC** Toolholder · Halter

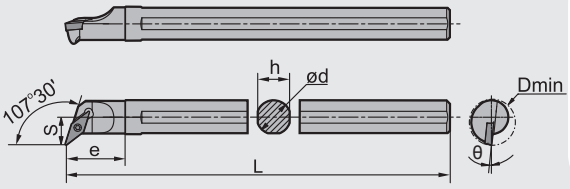
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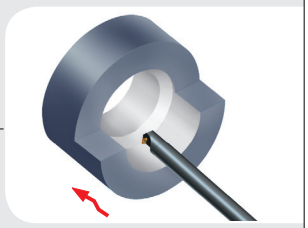
SVQCR/L

Kr:107°30'



R type
Rechtsausführung





Type · Typ	Stock Lager		Dimension (mm) Abmessung							Screw Schraube	Wrench Schlüssel		
	R	L	Dmin	ød	h	L	S	θ	e				
S16Q-SVQCR/L11	●	●	22	16	15	180	13	-6°	28	I60M2.5×6.5	WT07IP		
S20R-SVQCR/L11	●	●	26	20	18	200	15	-4°	32				

Applicable insert
Wendeschneidplatten

Application Anwendung	Extra Finishing Feinbearbeitung	Finishing Schlichten	Al machining Alu Bearbeitung
insert shape Schneidplattenform	**SF**  A106	**HF**  A106	**LH**  A107
Type · Typ ****-SVQCR/L11**	VC**1103**	VC**1103**	VCGX1103**

♦ Toolholder with wholes for Coolant · Klemmhalter mit Kühlmittelbohrung ● ex stock · ab Lager ○ on demand · auf Anfrage

VC** Toolholder · Halter

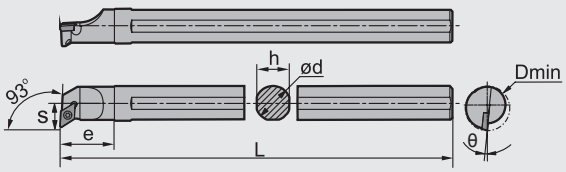
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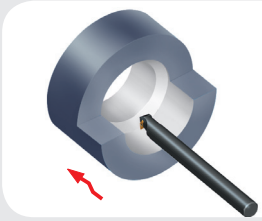
SVUCR/L

Kr:93°



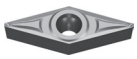
R type
Rechtsausführung





Type · Typ	Stock Lager		Dimension (mm) Abmessung							Screw Schraube	Wrench Schlüssel		
	R	L	Dmin	ød	h	L	S	θ	e				
S16Q-SVUCR/L11	●	●	24	16	15	180	15	-6°	25	I60M2.5×6.5	WT07IP		
S20R-SVUCR/L11	●	●	28	20	18	200	17	-4°	30				

Applicable insert
Wendeschneidplatten

Application Anwendung	Extra Finishing Feinbearbeitung	Finishing Schlichten	Al machining Alu Bearbeitung
insert shape Schneidplattenform	**SF**  A106	**HF**  A106	**LH**  A107
Type · Typ **-SVUCR/L11	VC**1103**	VC**1103**	VCGX1103**

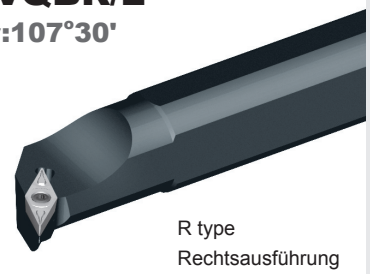
● ex stock · ab Lager ○ on demand · auf Anfrage ♦ Toolholder with whole for coolant · Klemmhalter mit Kühlmittelbohrung

VB** Toolholder · Halter

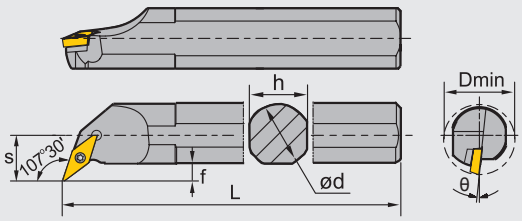
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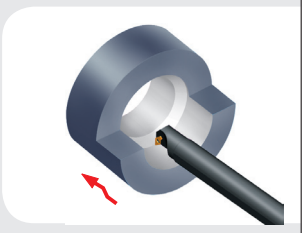
SVQBR/L

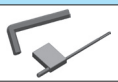
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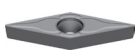
R type
Rechtsausführung





Type · Typ	Stock Lager		Dimension (mm) Abmessung								Screw Schraube	Wrench Schlüssel	Shim Unterlage	Shim/ Screw Schraube Unterlage
	R	L	Dmin	ød	h	L	S	θ	e	f				
S32R-SVQBR/L16			40	32	30	200	22	-8°	56	8.4	I60M3.5×12	WT15IP WH35L	V16BS	SM5×8.65XA
S32U-SVQBR/L16	●	●	40	32	30	350	22	-8°	56	8.4				
S40S-SVQBR/L16			50	40	37	250	27	-8°	64	9.4				
S40V-SVQBR/L16	●	●	50	40	37	400	27	-8°	64	9.4				
♦ A32S- SVQBR/L16	●	●	40	32	31	250	22	-8°	56	8.4				

Applicable insert
Wendeschneidplatten

Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	Roughing Schruppen	Cast iron machining Grauguss Bearbeitung
insert shape Schneidplattenform	**EF**  A108	**HM**  A109	**HR**  A109	Flat  A109
	NF  A108			
Type · Typ ****-SVQBR/L16**	VB**1604**	VB**1604**	VB**1604**	VB**1604**

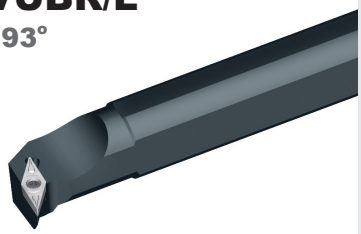
♦ Toolholder with wholes for Coolant · Klemmhalter mit Kühlmittelbohrung ● ex stock · ab Lager ○ on demand · auf Anfrage

VB** Toolholder · Halter

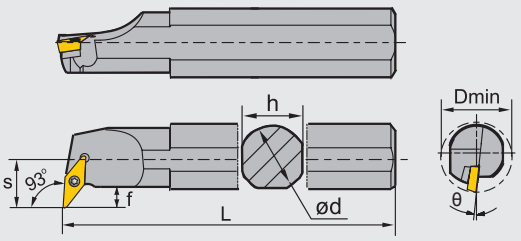
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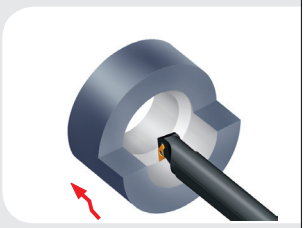
SVUBR/L

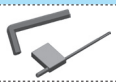
Kr:93°



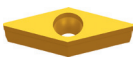
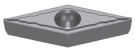
R type
Rechtsausführung





Type · Typ	Stock Lager		Dimension (mm) Abmessung								Screw Schraube	Wrench Schlüssel	Shim Unterlage	Shim/ Screw Schraube Unterlage
	R	L	Dmin	ød	h	L	S	θ	e	f				
S32R-SVUBR/L16	●	●	40	32	30	200	22	-8°	49	8.4	I60M3.5×12	WT15IP WH35L	V16BS	SM5×8.65XA
S32U-SVUBR/L16	●	●	40	32	30	350	22	-8°	49	8.4				
S40S- SVUBR/L16	●	●	50	40	37	250	27	-8°	56.5	9.4				
S40V- SVUBR/L16	●	●	50	40	37	400	27	-8°	56.5	9.4				
♦ A32S- SVUBR/L16	●	●	40	32	31	250	22	-8°	49	8.4				

Applicable insert
Wendeschneidplatten

Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	Roughing Schruppen	Cast iron machining Grauguss Bearbeitung
insert shape Schneidplattenform	**HF**  A108	**HM**  A109	**HR**  A109	Flat  A109
	EF  A108	**EM**  A109		
	NF  A108			
Type · Typ: ****-SVUBR/L16**	VB**1604**	VB**1604**	VB**1604**	VB**1604**

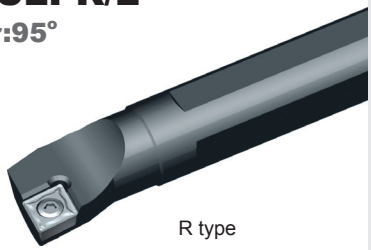
● ex stock · ab Lager ○ on demand · auf Anfrage ♦ Toolholder with whole for coolant · Klemmhalter mit Kühlmittelbohrung

CP** Toolholder · Halter

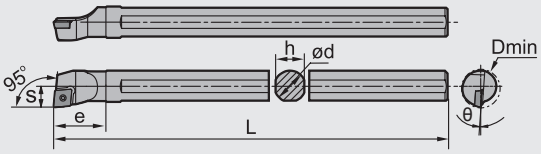
S-Clamping / S-Halter

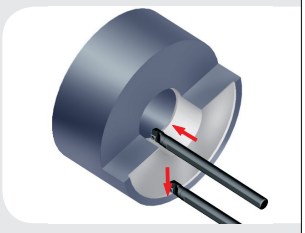
SCLPR/L

Kr:95°



R type
Rechtsausführung





Type · Typ	Stock Lager		Dimension (mm) Abmessung							Screw Schraube	Wrench Schlüssel		
	R	L	Dmin	ød	h	L	S	θ	e				
S10K-SCLPR/L06	●	●	12	10	9	125	6	-7°	17	I60M2.5×5.5	WT07IP		
S12M-SCLPR/L06	●	●	16	12	11	150	8	-4°	20				
S16Q-SCLPR/L09	●	●	20	16	15	180	10	-4°	29	I60M3.5×8	WT15IP		
S20R-SCLPR/L09	●	●	25	20	18	200	13	-4°	35				

Applicable insert
Wendeschneidplatten

Application Anwendung	Extra Finishing Feinbearbeitung
insert shape Schneidplattenform	**SF**  A87
Type · Typ **-SCLPR/L06	CP**0602**
Type · Typ **-SCLPR/L09	CP**09T3**

♦ Toolholder with wholes for Coolant · Klemmhalter mit Kühlmittelbohrung ● ex stock · ab Lager ○ on demand · auf Anfrage

DP** Toolholder · Halter

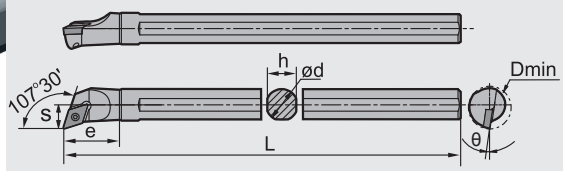
S-Clamping / S-Halter

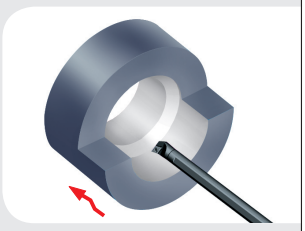
SDQPR/L

Kr:107°30'



R type
Rechtsausführung





Type · Typ	Stock Lager		Dimension (mm) Abmessung							Screw Schraube	Wrench Schlüssel		
	R	L	Dmin	ød	h	L	S	θ	e				
S10K-SDQPR/L07	●	●	13	10	9	125	7	-8°	20	I60M2.5×5.5	WT07IP		
S12M-SDQPR/L07	●	●	16	12	11	150	9	-8°	22				
S16Q-SDQPR/L07	●	●	20	16	15	180	11	-6°	27	I60M2.5×6.5			
S16Q-SDQPR/L11	●	●	20	16	15	180	11	-6°	32	I60M3.5×8	WT15IP		
S20R-SDQPR/L11	●	●	25	20	18	200	13	-6°	33				

Applicable insert
Wendeschneidplatten

Application Anwendung	Extra Finishing Feinbearbeitung
insert shape Schneidplattenform	**SF**  A91
Type · Typ ****-SDQPR/L07**	DP**0702**
Type · Typ ****-SDQPR/L11**	DP**11T3**

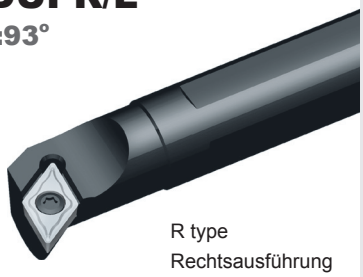
● ex stock · ab Lager ○ on demand · auf Anfrage ♦ Toolholder with whole for coolant · Klemmhalter mit Kühlmittelbohrung

DP** Toolholder · Halter

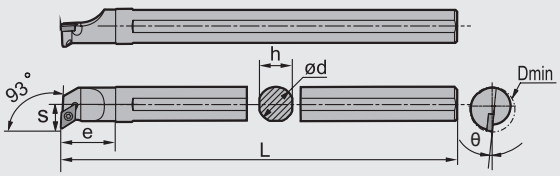
S-Clamping / S-Halter

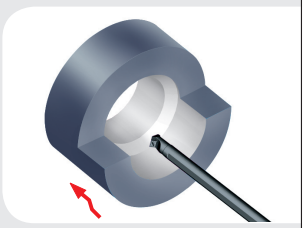
SDUPR/L

Kr:93°



R type
Rechtsausführung





Type · Typ	Stock Lager		Dimension (mm) Abmessung							Screw Schraube	Wrench Schlüssel		
	R	L	Dmin	ød	h	L	S	θ	e				
S10K-SDUPR/L07	●	●	15	10	9	125	9	-8°	18	I60M2.5×5.5	WT07IP		
S12M-SDUPR/L07	●	●	16	12	11	150	9	-8°	19				
S16Q-SDUPR/L07	●	●	20	16	15	180	11	-6°	25	I60M2.5×6.5			

Applicable insert
Wendeschneidplatten

Application Anwendung	Extra Finishing Feinbearbeitung
insert shape Schneidplattenform	**SF**  A91
Type · Typ **-SDUPR/L07	DP**0702**

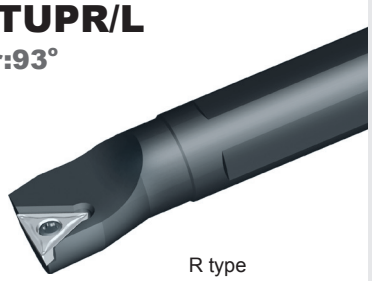
♦ Toolholder with wholes for Coolant · Klemmhalter mit Kühlmittelbohrung ● ex stock · ab Lager ○ on demand · auf Anfrage

TP** Toolholder · Halter

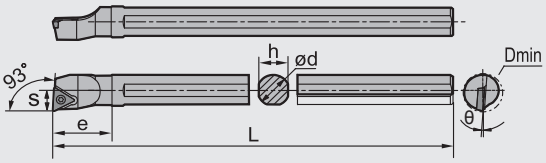
S-Clamping / S-Halter

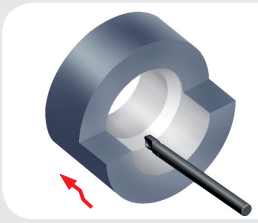
STUPR/L

Kr:93°



R type
Rechtsausführung





Type · Typ	Stock Lager		Dimension (mm) Abmessung							Screw Schraube	Wrench Schlüssel		
	R	L	Dmin	ød	h	L	S	θ	e				
S10K-STUPR/L09	●	●	12	10	9	125	6	6°	20	I60M2.5×5.5	WT07IP		
S12M-STUPR/L09	●	●	16	12	11	150	8	4°	22				
S12M-STUPR/L11	●	●	16	12	11	150	8	4°	25	I60M2.5×6.5	WT07IP		
S16Q-STUPR/L11	●	●	20	16	15	180	10	3°	27				

Applicable insert
Wendeschneidplatten

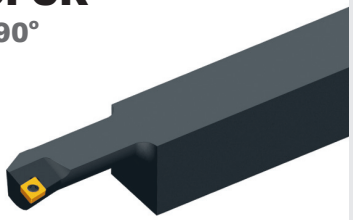
Type · Typ	Application Anwendung	Extra Finishing Feinbearbeitung
	insert shape Schneidplattenform	SF  A103
	**-STUPR/L09	TP**0902**
	**-STUPR/L11	TP**1103**

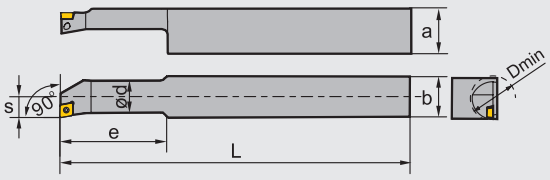
● ex stock · ab Lager ○ on demand · auf Anfrage ♦ Toolholder with whole for coolant · Klemmhalter mit Kühlmittelbohrung

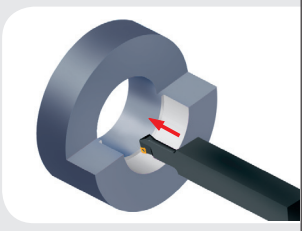
CC** Toolholder · Halter

S-Clamping / S-Halter

SCFCR
Kr:90°

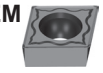






Type · Typ	Stock Lager		Dimension (mm) Abmessung							Screw Schraube	Wrench Schlüssel		
	R	L	Dmin	ød	L	s	a	b	e				
S10M-SCFCR06S25	●	●	13	10	150	7	27	25	30	I60M2.5×5.5	WT07IP		
S12P-SCFCR06S25	●		16	12	170	9	27	25	35	I60M2.5×6.5			
S16Q-SCFCR09S25	●	●	20	16	180	11	27	25	40	I60M3.5×8	WT15IP		
S20R-SCFCR09S25	●		25	20	200	13	27	25	45				
S25R-SCFCR12S25	●		32	25	200	17	27	25	50	I60M5×13	WT20IP		

Applicable insert
Wendeschneidplatten

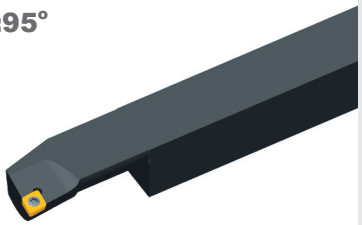
Application Anwendung	Extra Finishing Feinbearbeitung	Finishing Schlichten	Semi-finishing Mittlere Bearbeit.	Roughing Schruppen	Al machining Alu Bearbeitung	Cast iron ma. Grauguss Bear.
insert shape Schneidplattenform	SF  A84	HF  A84	HM  A85	HR  A86	LH  A86	 A86
		EF  A85	EM  A85			
Type · Typ **-SCFCR06	CC**0602**	CC**0602**	CC**0602**	CC**0602**	CCGX0602**	CC**0602**
**-SCFCR09	CC**09T3**	CC**09T3**	CC**09T3**	CC**09T3**	CCGX09T3**	CC**09T3**
**-SCFCR12	CC**1204**	CC**1204**	CC**1204**	CC**1204**	CCGX1204**	CC**1204**

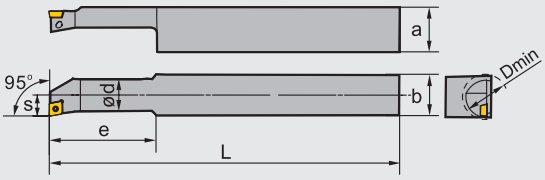
♦ Toolholder with wholes for Coolant · Klemmhalter mit Kühlmittelbohrung ● ex stock · ab Lager ○ on demand · auf Anfrage

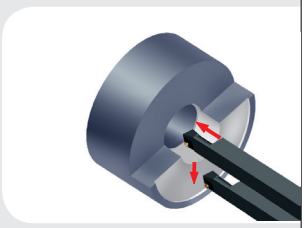
CC** Toolholder · Halter

S-Clamping / S-Halter

SCLCR
Kr:95°







Type · Typ	Stock Lager		Dimension (mm) Abmessung							Screw Schraube	Wrench Schlüssel		
	R	L	Dmin	ød	L	s	a	b	e				
S10M-SCLCR06S20	●		13	10	150	7	22	20	30	I60M2.5×5.5	WT07IP		
S12P-SCLCR06S20	●		16	12	170	9	22	20	35				
S16Q-SCLCR09S20	●		20	16	180	11	22	20	40	I60M3.5×8	WT15IP		
S20R-SCLCR09S20	●		25	20	200	13	22	20	60				

Applicable insert
Wendeschneidplatten

Application Anwendung	Extra Finishing Feinbearbeitung	Finishing Schlichten	Semi-finishing Mittlere Bearbeit.	Roughing Schruppen	Al machining Alu Bearbeitung	Cast iron machining Grauguss Bearbeit.
insert shape Schneidplattenform	**SF**  A84	**HF**  A84	**HM**  A85	**HR**  A86	**LH**  A86	 A86
		EF  A85	**EM**  A85			
Type · Typ ****-SCLCR06S20**	CC**0602**	CC**0602**	CC**0602**	CC**0602**	CCGX0602**	CC**0602**
****-SCLCR09S20**	CC**09T3**	CC**09T3**	CC**09T3**	CC**09T3**	CCGX09T3**	CC**09T3**

● ex stock · ab Lager ○ on demand · auf Anfrage ♦ Toolholder with whole for coolant · Klemmhalter mit Kühlmittelbohrung

Anti Vibration Boring Bar
Anti Vibration Bohrstange

Technical features · Technische Merkmale

By increasing the rigidity of the tool materials the vibration will be reduced. The carbide toolholder performs much better than steel toolholder. The cutting data can be increased and the shank overhang extended. Therefore you achieve better surface and higher workpiece precision.

Durch den Einsatz von Hartmetall als Werkzeugmaterial wird die Stabilität des Werkzeuges verbessert, und Vibrationen werden reduziert.
Die Hartmetall-Bohrstange erlaubt durch die Stabilität höhere Schnittleistungen und eine größere Auskragung. Darüberhinaus wird eine höhere Werkstückpräzision und eine exzellente Oberflächenqualität erzielt.

Vibration amplitude · Schwingungsausschlag

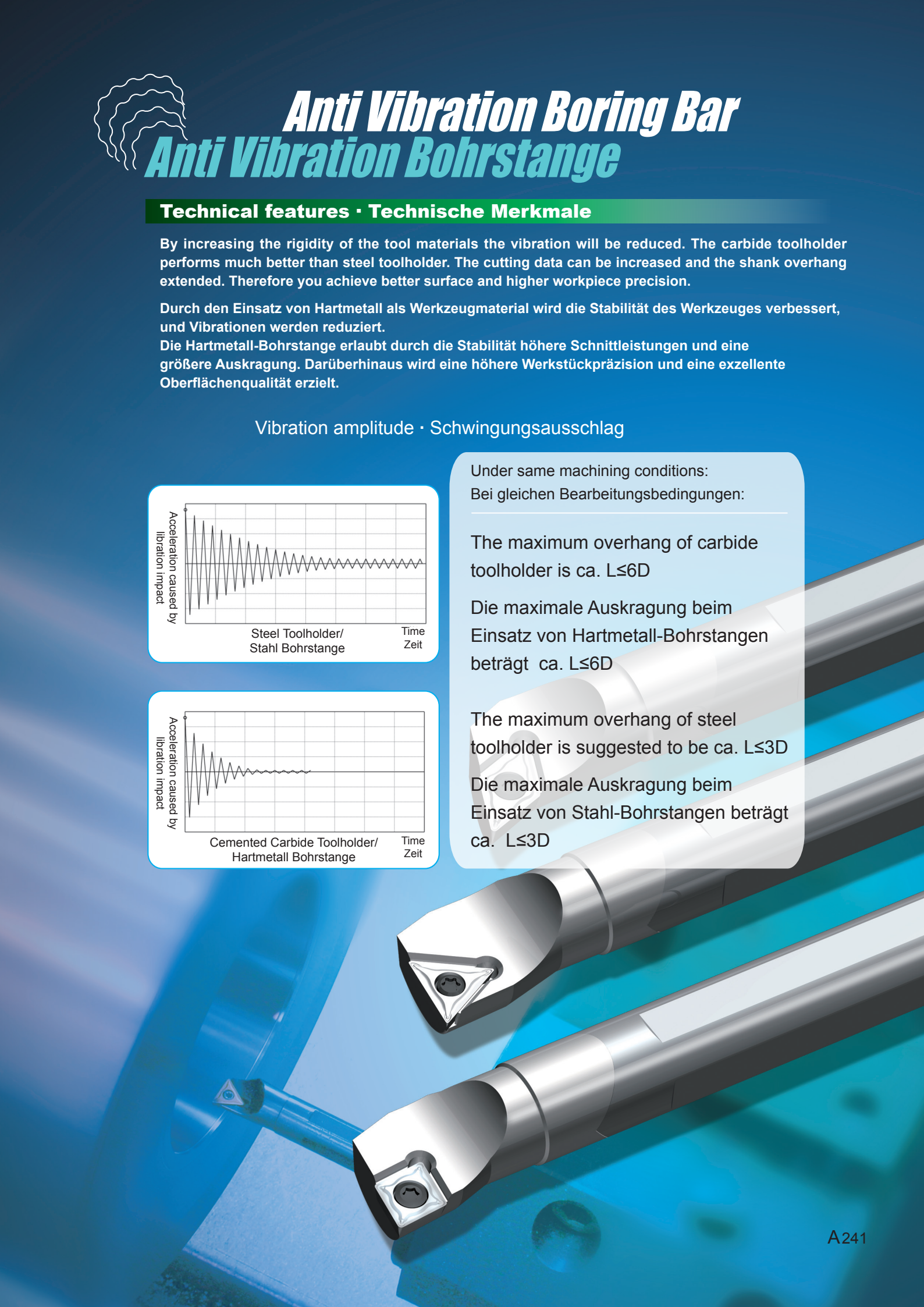
Under same machining conditions:
Bei gleichen Bearbeitungsbedingungen:

The maximum overhang of carbide toolholder is ca. L≤6D

Die maximale Auskragung beim Einsatz von Hartmetall-Bohrstangen beträgt ca. L≤6D

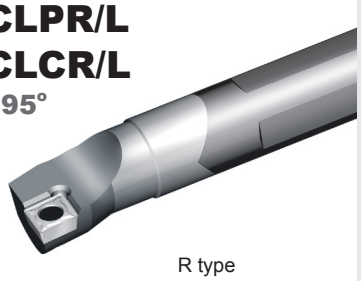
The maximum overhang of steel toolholder is suggested to be ca. L≤3D

Die maximale Auskragung beim Einsatz von Stahl-Bohrstangen beträgt ca. L≤3D

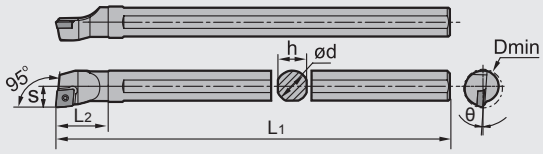


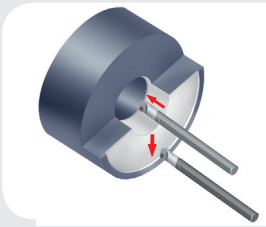
CP** / CC** Toolholder · Halter S-Clamping / S-Halter

SCLPR/L
SCLCR/L
Kr:95°



R type
Rechtsausführung





Type · Typ	Stock Lager		Dimension (mm) Abmessung							Screw Schraube	Wrench Schlüssel	Shim Unterlage	Shim/ Screw Schraube Unterlage
	R	L	ØD	ød	s	L_1	L_2	h	θ				
C10M-SCLPR/L06	●	●	12	10	6	150	17	9	7°	I60M2.5×5.5	WT07IP		
C12Q-SCLPR/L06	●		16	12	8	180	20	11	4°				
C16R-SCLPR/L09	●	●	20	16	10	200	29	15	4°	I60M3.5×8	WT15IP		
C20S-SCLPR/L09	●	●	25	20	13	250	35	18	4°				
♦ E16R-SCLPR/L09	○	○	19	16	10	200		15.5	-2°	I60M3.5×10	WT15IP		
♦ E20S-SCLPR/L09	○	○	24	20	13	250		19.5	-2°				
♦ E08K-SCLCR/L06	●	○	9	8	5	125		7.5	-12°	I60M2.5×5.5	WT07IP		
♦ E08K-SCLCR/L06	●	○	10	8	6	125		7.5	-12°				
♦ E10M-SCLCR/L06	●	○	12	10	7	150		9.5	-10°				
♦ E12Q-SCLCR/L06	●	○	15	12	9	180		11.5	-10°				
♦ E12Q-SCLCR/L09	●	●	15	12	9	180		11.5	-9°	I60M3.5×10	WT15IP		
♦ E16R-SCLCR/L06	●	○	18	16	10	200		15.5	-8°	I60M2.5×5.5	WT07IP		
♦ E16R-SCLCR/L09	●	●	18	16	10	200		15.5	-10°	I60M3.5×10	WT15IP		
♦ E20S-SCLCR/L09	●	●	24	20	13	250		19.5	-8°				
♦ E25T-SCLCR/L09	●	○	31	25	17	300		24	-6°				

Weiter Durchmesser auf Anfrage / more diameter on demand

Applicable insert
Wendeschneidplatten

Type · Typ	Application Anwendung	Extra Finishing Feinbearbeitung
	insert shape Schneidplattenform	**SF**  A87
	C*-SCLPR/L06	CP**0602**
	C*--SCLPR/L09	CP**09T3**
	E*-SCLCR/L06	CC**0602**
	E*--SCLCR/L09	CC**09T3**

● ex stock · ab Lager ○ on demand · auf Anfrage ♦ Toolholder with whole for coolant · Klemmhalter mit Kühlmittelbohrung

DP** / DC** Toolholder · Halter

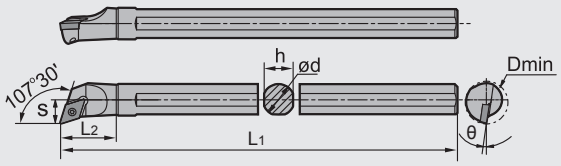
S-Clamping / S-Halter

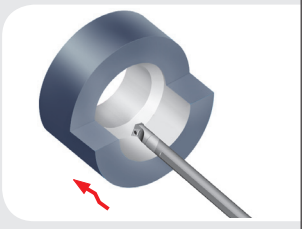
SDQPR/L
SDQCR/L

Kr:107°30'



R type
Rechtsausführung





Type · Typ	Stock Lager		Dimension (mm) Abmessung							Screw Schraube	Wrench Schlüssel		
	R	L	ØD	ød	s	L_1	L_2	h	θ				
C10M-SDQPR/L07	●	●	13	10	7	150	20	9	8°	I60M2.5×5.5	WT07IP		
C12Q-SDQPR/L07		●	16	12	9	180	22	11	8°				
C16R-SDQPR/L07	●		20	16	11	200	27	15	6°	I60M2.5×6.5			
C16R-SDQPR/L11	●	●	20	16	11	200	32	15	6°	I60M3.5×8	WT15IP		
C20S-SDQPR/L11	●		25	20	13	250	33	18	6°				
♦ E08K-SDQCR/L07	●	○	11	8	6.5	140		7.5	-12°	I60M2.5×5.5	WT07IP		
♦ E10M-SDQCR/L07	●	○	12	10	7	150		9.5	-10°				
♦ E12Q-SDQCR/L07	●	○	15	12	9	180		11.5	-10°				
♦ E16R-SDQCR/L07	●	○	18	16	10	200		15.5	-6°				
♦ E16R-SDQCR/L11	●	○	18	16	10	200		15.5	-8°	I60M3.5×10	WT15IP		
♦ E20S-SDQCR/L07	●	○	24	20	13	250		19.5	-4°	I60M2.5×5.5	WT07IP		
♦ E20S-SDQCR/L11	●	○	24	20	13	250		19.5	-8°	I60M3.5×10	WT15IP		
♦ E25T-SDQCR/L11	○	○	31	25	17	300		24	-6°				

Weiter Durchmesser auf Anfrage / more diameter on demand

Applicable insert
Wendeschneidplatten

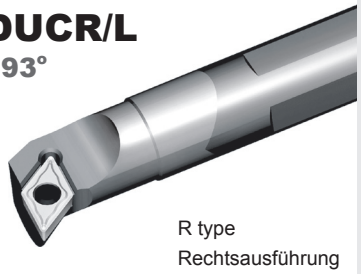
Type · Typ	Application Anwendung	Extra Finishing Feinbearbeitung
	insert shape Schneidplattenform	**SF**  A93
	C*-SDQPR/L07	DP**0702**
	C*-SDQPR/L11	DP**11T3**
	E*-SDQCR/L07	DC**0702**
	E*--SDQCR/L11	DC**11T3**

♦ Toolholder with wholes for Coolant · Klemmhalter mit Kühlmittelbohrung ● ex stock · ab Lager ○ on demand · auf Anfrage

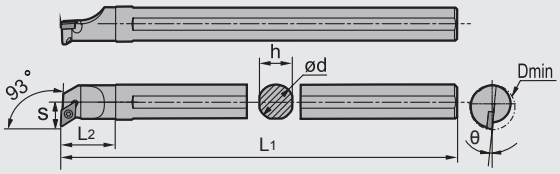
DP** / DC** Toolholder · Halter

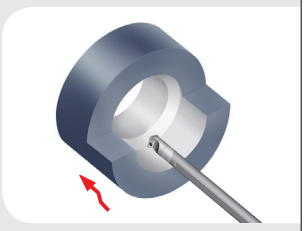
S-Clamping / S-Halter

SDUPR/L
SDUCR/L
Kr:93°



R type
Rechtsausführung





Type · Typ	Stock Lager		Dimension (mm) Abmessung							Screw Schraube	Wrench Schlüssel		
	R	L	ØD	ød	s	L_1	L_2	h	θ				
C10M-SDUPR/L07	●	●	15	10	9	150	18	9	8°	I60M2.5×5.5	WT07IP		
C12Q-SDUPR/L07	●	●	16	12	9	180	19	11	8°	I60M2.5×6.5			
C16R-SDUPR/L07	●	●	20	16	11	200	25	15	6°				
♦ E10M-SDUCR/L 07	●	○	12	10	7	150		9.5	-10°	I60M2.5×5.5	WT07IP		
♦ E12Q-SDUCR/L 07	●	○	15	12	9	180		11.5	-10°				
♦ E16R-SDUCR/L 07	●	○	18	16	10	200		15.5	-6°				
♦ E16R-SDUCR/L 11	●	○	18	16	10	200		15.5	-8°	I60M3.5×10	WT15IP		
♦ E20S-SDUCR/L 07	○	○	24	20	13	250		19.5	-4°	I60M2.5×5.5	WT07IP		
♦ E20S-SDUCR/L 11	○	○	24	20	13	250		19.5	-8°	I60M3.5×10	WT15IP		
♦ E25S SDUCR/L 11	○	○	31	25	17	300		24	-6°				

Weiter Durchmesser auf Anfrage / more diameter on demand

Applicable insert
Wendeschneidplatten

Type · Typ	Application Anwendung	Extra Finishing Feinbearbeitung
	insert shape Schneidplattenform	**SF**  A93
	C*-SDUPR/L07	DP**0702**
	E*-SDUCR/L07	DC**0702**
	E*-SDUCR/L11	DC**11T3**

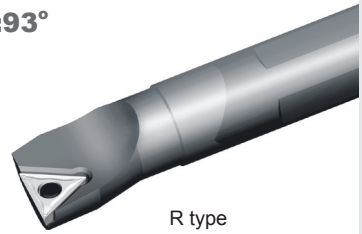
● ex stock · ab Lager ○ on demand · auf Anfrage ♦ Toolholder with whole for coolant · Klemmhalter mit Kühlmittelbohrung

TP** Toolholder · Halter

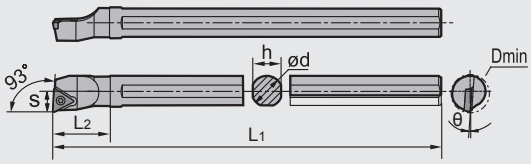
S-Clamping / S-Halter

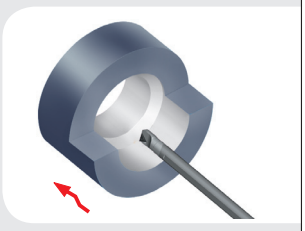
STUPR/L

Kr:93°



R type
Rechtsausführung





Type · Typ	Stock Lager		Dimension (mm) Abmessung							Screw Schraube	Wrench Schlüssel		
	R	L	ØD	ød	s	L_1	L_2	h	θ				
C10M-STUPR/L09	●	●	12	10	6	150	20	9	6°	I60M2.2×5.5	WT07IP		
C12Q-STUPR/L09	●		16	12	8	180	22	11	4°				
C12Q-STUPR/L11	●		16	12	8	180	25	11	4°	I60M2.5×6.5	WT07IP		
C16R-STUPR/L11	●		20	16	10	250	27	15	3°				

Applicable insert
Wendeschneidplatten

Application Anwendung	Extra Finishing Feinbearbeitung
insert shape Schneidplattenform	**SF**  A103

Type Typ	
C*-STUPR/L09	TP**0902**
C*-STUPR/L11	TP**1103**

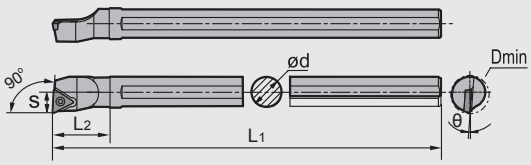
♦ Toolholder with wholes for Coolant · Klemmhalter mit Kühlmittelbohrung ● ex stock · ab Lager ○ on demand · auf Anfrage

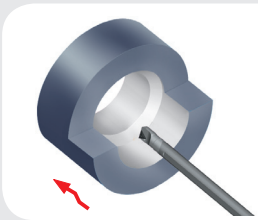
TC** Toolholder · Halter

S-Clamping / S-Halter

STFCR/L
Kr:90°







Type · Typ	Stock Lager		Dimension (mm) Abmessung							Screw Schraube	Wrench Schlüssel		
	R	L	ØD	ød	s	L_1	L_2	h	θ				
♦ E08K STFCR/L 09	○	○	11	8	6	125		7.5	-12	I60M2.2×5.5	WT07IP		
♦ E10M STFCR/L 09	○	○	12	10	7	150		9.5	-10				
♦ E12Q STFCR/L 11	○	○	15	12	9	180		11.5	-10	I60M2.5×5.5	WT07IP		
♦ E16R STFCR/L 11	○	○	18	16	10	200		15.5	-8				
♦ E20S STFCR/L 11	○	○	24	20	13	250		19.5	-8				
♦ E20S STFCR/L 16	○	○	24	20	13	250		19.5	-8	I60M3.5×10	WT15IP		
♦ E25T STFCR/L 16	○	○	31	25	17	300		24	-6				
♦ E10M STFPR/L 11	○	○	12	10	6	150		9.5	-5	I60M3.0×7.0	WT08IP		
♦ E12Q STFPR/L 11	○	○	15	12	8	180		11.5	-4				
♦ E16R STFPR/L 11	○	○	19	16	10	200		15.5	-2				
♦ E20S STFPR/L 11	○	○	24	20	13	250		19	-2				

Weiter Durchmesser auf Anfrage / more diameter on demand

Applicable insert
Wendeschneidplatten

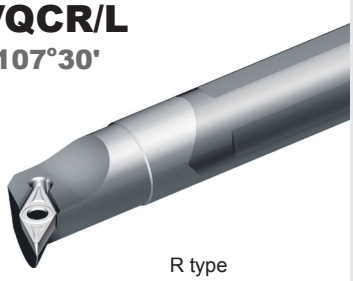
Type Typ	Application Anwendung	Extra Finishing Feinbearbeitung
	insert shape Schneidplattenform	SF  A98
Type Typ	E*-STFCR/L09	TC**0902**
	E*-STFCR/L11	TC**1103**
	E*-STFCR/L16	TC**16T3**
	E*-STFPR/L11	TP**1103**

VC** Toolholder · Halter

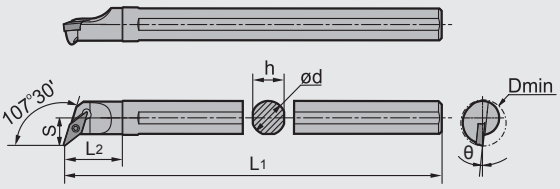
S-Clamping / S-Halter

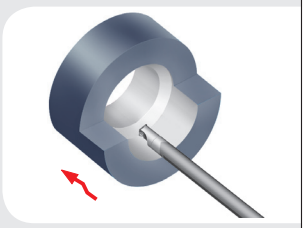
SVQCR/L

Kr:107°30'



R type
Rechtsausführung





Type · Typ	Stock Lager		Dimension (mm) Abmessung							Screw Schraube	Wrench Schlüssel		
	R	L	ØD	ød	s	L_1	L_2	h	θ				
C16R-SVQCR/L11	●	●	22	16	13	200	28	15	-6°	I60M2.5×6.5	WT07IP		
C20S-SVQCR/L11	●	●	26	20	15	250	32	18	-4°				

Applicable insert
Wendeschneidplatten

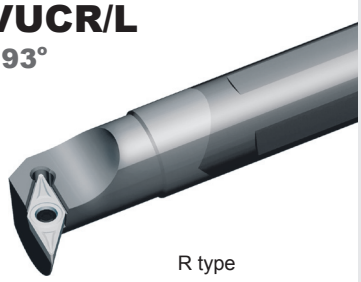
Application Anwendung	Extra Finishing Feinbearbeitung	Finishing Schlichten	Al machining Alu Bearbeitung
insert shape Schneidplattenform	**SF**  A106	**HF**  A106	**LH**  A107
Type · Typ **C*-SVQCR/L11**	VC**1103**	VC**1103**	VCGX1103**
Type · Typ **C*-SVUCR/L11**	VC**1103**	VC**1103**	VCGX1103**

VC** Toolholder · Halter

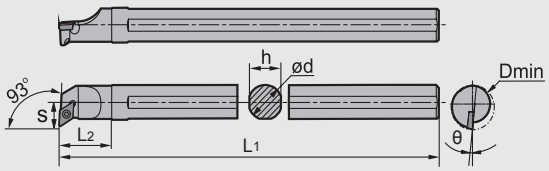
S-Clamping / S-Halter

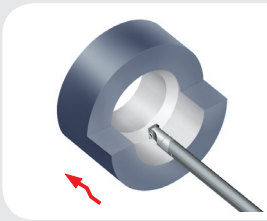
SVUCR/L

Kr:93°



R type
Rechtsausführung





Type · Typ	Stock Lager		Dimension (mm) Abmessung							Screw Schraube	Wrench Schlüssel		
	R	L	ØD	ød	s	L_1	L_2	h	θ				
C16R-SVUCR/L11	●	●	24	16	15	200	25	15	6°	I60M2.5×6.5	WT07IP		
C20S-SVUCR/L11	●	●	28	20	17	250	30	18	4°				
♦ E16R SVUCR/L 11	○	○	22	16	13	200		15	-6.5°	I60M2.5×6.5	WT07IP		
♦ E20S SVUCR/L 11	○	○	27	20	13	250		18	-6.5°				
♦ E25S SVUCR/L 16	○	○	35	25	20.5	300		23	-6.5°	I60M3.5×10	WT15IP		

Weiter Durchmesser auf Anfrage / more diameter on demand

Applicable insert
Wendeschneidplatten

Application Anwendung	Extra Finishing Feinbearbeitung	Finishing Schlichten	Al machining Alu Bearbeitung
insert shape Schneidplattenform	**SF**  A106	**HF**  A106	**LH**  A107
Type · Typ **C*-SVUCR/L11**	VC**1103**	VC**1103**	VCGX1103**
E*-SVUCR/L11	VC**1103**	VC**1103**	VCGX1103**

● ex Stock Lager · ab Lager ○ on demand · auf Anfrage

♦ Toolholder with wholes for Coolant · Klemmhalter mit Kühlmittelbohrung

■ Recommended cutting data · Empfohlene Schnittdaten

ISO	Workpiece Materials Werk-stückstoff		Hardness · Härte HB	CVD Coating · Beschichtung					PVD Coating · Beschicht.			Cermet	Coated cermet	Cemented carbide/ unbe. Hartmetall		Ceramic Keramik	
				YBC151	YBC251	YBC152	YBC252	YBC351	YBG102	YBG202	YBG302	YNG151	YNG151C	YC10	YC40	CA1000	CN2000
				Feed rate · Vorschub (mm/rev)													
				0.1-0.6	0.1-0.8	0.1-0.6	0.1-0.8	0.2-1.0	0.2-0.4	0.1-0.6	0.05-0.8	0.05-0.2	0.05-0.2	0.1-0.4	0.1-0.5	0.1-1.5	0.1-1.5
				Cutting speed · Schnittgeschwindigkeit (m/min)													
P	Carbon steel Kohlenstoffstahl	C=0.15%	125	430-200	430-190	500-270	480-240	380-165	460-220	380-180	360-165	550-350	580-350	360-165	300-145	800-300	
		C=0.35%	150	380-180	410-180	460-250	460-230	300-150	440-210	300-170	280-150	500-300	520-300	280-150	220-130	600-200	
		C=0.60%	200	330-150	350-150	400-220	400-200	260-130	380-180	260-150	240-130	460-260	480-260	240-130	180-80	400-150	
	Alloy steel legierter Stahl	low alloy, annealed geglüht	180	350-170	350-150	400-180	400-200	200-100	380-180	200-120	180-100	410-240	430-240	180-100	160-80	150-180	400-150
		low alloy, tempered vergütet	275	230-100	210-100	280-150	260-140	140-70	240-120	140-90	120-70	300-180	320-180	120-70	120-50	350-120	300-100
		low alloy, tempered vergütet	300	210-100	190-70	260-150	240-120	125-60	220-100	125-80	100-60	250-170	270-170	100-60	80-40	300-100	250-80
		low alloy, tempered vergütet	350	180-80	170-70	230-120	220-120	110-55	200-100	110-75	90-55	230-150	250-150	90-55	70-45	300-80	
	High alloy steel Hochlegierter	high alloy, annealed geglüht	200	320-150	260-120	360-190	310-170	175-80	290-150	175-100	155-80	350-200	370-200	155-80	135-60	400-150	350-120
		high alloy, tempered vergütet	325	140-90	100-50	190-130	150-100	85-40	130-80	85-60	65-40	170-110	190-110	65-40	45-30	300-100	280-80
	Cast steel Stahlguss	Non-Alloy unlegiert	180	240-120	200-100	280-160	250-140	135-75	230-125	135-95	115-75	260-170	280-170	115-75	95-55	600-220	
		Low alloy niedrig legiert	200	230-70	170-60	280-110	220-110	120-80	200-90	120-100	100-80	260-170	280-170	100-80	80-60	400-150	
		High alloy hoch legiert	225	160-70	140-50	210-110	190-100	95-55	170-80	95-55	95-55	260-100	280-100	95-55	75-35	350-120	

ISO	Workpiece Materials Werk-stückstoff		Hardness · Härte HB	CVD Coating · Beschichtung					PVD Coating · Beschicht.			Cermet	Coated cermet				
				YBM151	YBM251				YBG202	YBG302		YNG151	YNG151C				
				Feed rate · Vorschub (mm/rev)													
				0.2-0.6	0.2-0.6				0.1-0.4	0.2-0.6		0.1-0.3	0.1-0.3				
				Cutting speed · Schnittgeschwindigkeit (m/min)													
M	Stainless steel Rostfreier Stahl	Ferrite	180	280-180	250-140				300-190	250-150		330-220	350-210				
		Austenite	260	250-150	200-110				250-160	220-120		250-150	270-140				
		Martensite	330	200-140	210-130				260-170	210-120		270-170	290-160				

A

Recommended table of cutting parameters for general turning
Empfohlene Schnittparameter für allgemeine Drehbearbeitung

ISO	Workpiece Materials Werk-stückstoff		Hardness · Härte HB	CVD Coating · Beschichtung					Cermet	Coated cermet	Ceramic Keramik			Cemented carbide/ unbe. Hartmetall	
				YBD052	YBD151	YBD102	YBD152	YBD252	YNG151	YNG151C	CA1000	CN1000	CN2000	YC10	YC40
				Feed rate · Vorschub (mm/rev)											
				0.1-0.4	0.1-0.6	0.1-0.4	0.1-0.5	0.1-0.8	0.1-0.4	0.1-0.4	0.1-1.5	0.1-1.5	0.1-1.5	0.1-0.3	0.1-0.4
				Cutting speed · Schnittgeschwindigkeit (m/min)											
K	Malleable cast iron Temperguss	Ferrite	130	350-230	315-210	330-220	320-105	250-170	280-160	300-180	1200-200	800-600	800-600	150-90	105-45
		Pearlite	230	250-105	225-95	230-100	230-100	180-75	220-120	240-150	1000-200	700-500	700-500	120-70	80-30
	Low cast iron Grauguss		180	520-200	450-180	480-200	480-190	380-150	400-250	420-270	1200-200	800-600	700-500	170-100	130-60
	High cast iron Grauguss		260	230-120	210-110	220-115	210-100	170-90	360-240	380-260	1000-200	750-500	800-600	130-70	95-40
	Nodular cast iron	Ferrite	160	310-150	285-140	300-150	290-140	220-110	330-190	350-210	800-200	600-450	600-450	140-80	115-45
		Pearlite	250	230-110	210-100	220-105	210-100	170-90	310-200	330-220	700-200	500-350	500-350	110-70	80-30

ISO	Workpiece Materials Werk-stückstoff		Hardness · Härte HB	PVD Coating · Beschichtung		Cemented carbide Hartmetall	CBN		PCD PKD						
				YBG102		YD101	YCB011	YCB012	YCD011						
				Feed rate · Vorschub (mm/rev)											
				0.05-0.15		0.05-0.35	0.05-0.5	0.05-0.2	0.05-0.5						
				Cutting speed · Schnittgeschwindigkeit (m/min)											
N	Al alloy Al Legierung	No heat treatment keine Wärmebeh.	60			1750-800			2500-						
		Heat treatment	100			510-250			2500-						
	Cast aluminum alloy Alu. leg.	No heat treatment keine Wärmebeh.	75			460-175			2500-						
		Heat treatment keine Wärmebeh.	90			300-110			2500-						
	Copper alloy Kupfer leg.	Lead alloy keine Wärmebeh.	110			610-205			630-65						
		Copper, pure copper	90			310-195			630-65						
		Copper, nonleaded Copper, electrolytic copper	100			225-115			375-30						
S	Ni-base alloy	Ni-base alloy	40	90-30		70-20									
H	Other materials Andere Materialien	Hard steel	45 HRC					350-225							
		Super hard steel	50~60 HRC					250-135							
		Chilled cast iron	500				180-120								

■ Correctional cutting parameters table of internal turning
Schnittparameter Übersicht zur Drehinnenbearbeitung

Internal turning tools by P type clamping · Drehwerkzeuge (Innen) P Typ Klemmung

Workpiece material Werkstück Material		Hardness HB Härte	Machining category Anwendung	L/D≤3		L/D=3-4 (Diameter of shank≥Φ16mm)	
				Feed rate Vorschub (mm/rev)	Cutting depth Schnitttiefe (mm)	Feed rate Vorschub (mm/rev)	Cutting depth Schnitttiefe (mm)
P	Carbon steel, Alloy steel Kohlenstoff Stahl, Stahlleg. 45#, 42CrMo	HB180—280	Semi-finishing Mittlere Bear.	0.1-**0.25**-0.4	<5.0	0.1-**0.2**-0.3	<4.0
M	Stainless steel Rostfreier Stahl 1Cr18Ni9Ti 0Cr18Ni9	≤HB220	Semi-finishing Mittlere Bear.	0.1-**0.2**-0.3	<4.0	0.1-**0.15**-0.25	<3.0
K	Cast iron HT250 Gusseisen	HB170—230	Semi-finishing Mittlere Bear.	0.1-**0.25**-0.4	<5.0	0.1-**0.2**-0.3	<4.0

Internal turning tools by S type clamping · Drehwerkzeuge (Innen) S Typ Klemmung

Workpiece material Werkstück Material		Hardness HB Härte	Machining category Anwedung	L/D≤3		L/D=4		L/D=5		L/D=6	
				Feed rate Vorschub (mm/rev)	Cutting depth (mm)	Feed rate Vorschub (mm/rev)	Cutting depth (mm)	Feed rate Vorschub (mm/rev)	Cutting depth (mm)	Feed rate Vorschub (mm/rev)	Cutting depth (mm)
P	Carbon steel, Alloy steel Kohlenst. Stahl, leg. Stahl 45#, 42CrMo	HB180-280	For finishing Schlichten	0.05-**0.1**-0.15	<0.2	0.05-**0.1**-0.15	<0.2	-	-	-	-
			For semi-finishing Mittlere Bear.	0.15-**0.25**-0.35	<3.0	0.1-**0.15**-0.2	<1.5	-	-	-	-
M	Stainless steel Rostfreier Stahl 1Cr18Ni9Ti 0Cr18Ni9	≤HB220	For finishing Schlichten	0.05-**0.1**-0.15	<0.2	0.05-**0.1**-0.15	<0.2	-	-	-	-
			For semi-finishing Mittlere Bear.	0.15-**0.2**-0.25	<2.0	0.1-**0.15**-0.2	<1.0	-	-	-	-
N	Al Alloy	---	For finishing Schlichten	0.05-**0.1**-0.15	<0.2	0.05-**0.1**-0.15	<0.2	0.05-**0.1**-0.15	-0.15	0.05-**0.1**-0.15	<0.1
			For semi-finishing Mittlere Bear.	0.05-**0.1**-0.15	<2.0	0.05-**0.1**-0.15	<1.5	0.05-**0.1**-0.15	-1.0	0.05-**0.1**-0.15	<1.0

Antivibration internal turning tools · Antivibrations Drehwerkzeuge (Innen)

Workpiece material		Machining conditions Anwendung	Chipbreaker Spanbrecher	Grade Sorte	Feed rate Vorschub (mm/rev)	Cutting depth Schnitttiefe (mm)
P	Steel HB180—280 Stahl	Finishing Schlichten	SF	YNG151 YNG151C	0.05-**0.2**-0.35	0.05-**0.1-0.3**-0.5
M	Stainless steel ≤HB220 Rostfreier Stahl				0.05-**0.2**-0.35	0.05-**0.1-0.3**-0.5
K	Cast iron HB170—230 Gusseisen				0.05-**0.2**-0.35	0.05-**0.1-0.3**-0.5

Letters in blue color are recommended cutting parameters

No.	Tool wear type	Situation	Reason	Countermeasures
1+2	Flank wear	Poor surface quality and inconsistent measurement. Increase in cutting force.	Grade is too soft Cutting speed is too high. Flank angle is too small. Feed rate is too low	Select grade with higher wear resistance Reduce cutting speed Increase flank angle. Increase feed rate
3	Crater wear	Bad surface and chip control	Grade is too soft. Cutting speed is too high. Feed rate is too high.	Select grade with higher wear resistance Reduce cutting speed Reduce feed rate
4	Chipping	Tool life not stable Sudden breakage of cutting edge	Grade is too hard. Feed rate is too high. Cutting edge strength not strong enough The rigidity of holder in insuffiecient (vibration)	Select grade with higher toughness Reduce feed rate Change honing of cutting edge Use holder with bigger shank size
5	Fracturing	Cutting force increasing Surface roughness and measure becomes bad	Grade is too hard. Feed rate is too high. Cutting edge strength not strong enough The rigidity of holder in insufficient	Select grade with higher toughness Reduce feed rate Change honing of cutting edge Use holder with bigger shank size
6	Plastic deformation	Inconsistent measure meet. Damage to the cutting edge	Grade is too soft. Cutting speed is too high. Depth of cut and feed rate too high Cutting temperature is high	Grade with high wear resistance. Reduce cutting speed Decrease depth of cut and feed rate. Grade with high thermal conductivity.
7	Welding	Poor surface quality and inconsistent measurement. Increase in cutting force.	Cutting speed is low. Cutting edge not sharp enough Grade not suitable	Increase cutting speed Increase rake angle. Select grade with lower affinity
8	Thermal Cracks	Break due to thermal variation effect often caused when cutting is interrupted.	Expansion or shrinkage due to cutting heat Grade is too hard.	Use dry cutting Select grade with higher toughness
9	Notch wear	Burr increase of Cutting force information	Unstable cutting condition (uncut surface,chilled parts, machining hardened layer) Friction caused by jagged shape chips. Feed rate and cutting speed too high	Grade with high wear resistance. Increase rake angle to improve sharpness Decrease cutting speed
10	Flaking	Mostly happnes during machining of high hard materials or vibration	Cutting edge welding and adhesion. Bad chip removing	Increase rake angle to improve sharpness Use chip breaker with wider chip pocket

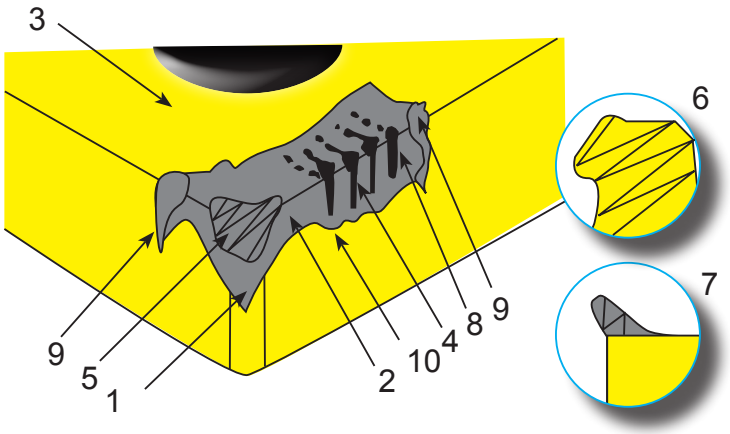


Bild	Art des Verschleißes	Auswirkungen	Grund	Gegenmaßnahmen
1+2	Freiflächen-verschleiß	Schlechte Oberflächengüte und Maßhaltigkeit Anstieg der Schnittkraft	Sorte nicht verschleißfest genug Schnittgeschwindigkeit zu hoch Freiwinkel zu klein Vorschub zu gering	Sorte mit höherer Verschleißfestigkeit Schnittgeschwindigkeit reduzieren Freiwinkel vergrößern Vorschub reduzieren
3	Kolkverschleiß	Schlechte Oberflächengüte und Spankontrolle	Sorte nicht verschleißfest genug Schnittgeschwindigkeit zu hoch Vorschub zu hoch	Sorte mit höherer Verschleißfestigkeit Schnittgeschwindigkeit reduzieren Vorschub reduzieren
4	Ausbröckelung	Standzeit nicht stabil Plötzlicher Bruch der Schneidkante	Sorte ist zu hart Vorschub zu hoch Schneidkantenstabilität nicht ausreichend Stabilität des Werkzeughalter oder Spannung nicht ausreichend	Sorte mit höherer Zähigkeit Vorschub reduzieren Schneidkanten-verrundung ändern Stabileren Halter verwenden
5	Bruch	Anstieg der Schnittkraft Schlechte Oberflächengüte und Maßhaltigkeit	Sorte ist zu hart Vorschub zu hoch Schneidkantenstabilität nicht ausreichend Stabilität des Werkzeughalter oder Spannung nicht ausreichend	Sorte mit höherer Zähigkeit Vorschub reduzieren Schneidkanten-verrundung ändern Stabileren Halter verwenden
6	Plastische Deformation	Schlechte Maßhaltigkeit Beschädigung der Schneidkante	Sorte nicht verschleißfest genug. Schnittgeschwindigkeit zu hoch Schnitttiefe und/oder Vorschub zu hoch Temperatur an der Schneide zu hoch	Sorte mit höherer Verschleißfestigkeit Schnitt-geschwindigkeit reduzieren Schnitttiefe und Vorschub reduzieren Sorte mit höherer Wärmebeständigkeit
7	Aufbauschneide	Anstieg der Schnittkraft Schlechte Oberflächengüte	Schnittgeschwindigkeit zu niedrig Schneidkante nicht scharf genug Sorte nicht geeignet	Schnittgeschwindigkeit erhöhen Spanwinkel erhöhen Sorte mit geringer Affinität
8	Thermischer Verschleiß	Bruch durch thermische Wechselwirkung Oft bei unterbrochenem Schnitt (Fräsen)	Durch die Bearbeitungs-Temperatur-schwankungen Sorte ist zu hart	Trockenbearbeitung Sorte mit höherer Zähigkeit
9	Kerbverschleiß	Gratbildung Anstieg der Schnittkraft	Beschädigung durch Späne (ausgefranste Spankante) Vorschub und Schnittgeschwindigkeit zu hoch	Sorte mit höherer Verschleißfestigkeit Spanwinkel vergrößern um eine schärfere Schneide zu bekommen Schnittgeschwindig-keit verringern
10	Abplatzung (Beschichtung)	Oft bei der Bearbeitung härterer Werkstoffe oder wenn Vibrationen auftauchen	Verklebungen an der Schneidkante sowie Ausbrüche. Schlechte Spanabfuhr	Spanwinkel vergrößern um eine schärfere Schneide zu bekommen Spanbrecher mit größerer Spankammer

Turning · Drehen

Parting and Grooving · Ab & Einstechen

Parting and grooving tools overview · Ab- & Einstechen Übersicht **A255-A257**

Parting and grooving inserts · Abstech- und Einstechplatten **A258-A268**

Chip breaker introduction of "Squirrel Series" inserts A258-A259
Spanbrecher der Einsätze von der "Squirrel Serie"

Parting, grooving and profiling inserts code key A260
Ab- & Einstechplatte ISO Kennzeichen

Inserts of · Stechplatten der "Squirrel Serie" A261-A266

154.3 Series A267

ZQMX series A267

ZSMF·ZSMX series A268

Parting and grooving tools · Ab- & Einstechwerkzeuge "Squirrel Series" **A269-A287**

parting and grooving tools code key · Ab- & Einstechwerkzeuge A269-A270

External parting, grooving and turning tools · Ab- & Einstechwerkzeuge (Außen) A271-A271

Precise grooving and turning tools · Präzisions Einstech- & Drehwerkzeuge A273

External recess and profiling tools · Hinterdrehstech- & Profildrehwerkzeuge (Außen) A273

External grooving tools for difficult machining A274
Stechdrehwerkzeuge für die schwierige Bearbeitung (Außen)

External parting blade & holder for external parting A275
Abstech-Schwert zur Außenbearbeitung & Spannblock zur Außenbearbeitung

Axial grooving and turning tools · Axial Einstech- & Drehwerkzeuge A276-A283

Internal grooving and turning tools · Ab- & Einstechwerkzeuge (Innen) A284

Profiling and turning tools for Al. · Profil- & Drehwerkzeuge (Aluminium) A284

Complementary series· Erweiterende Serie A285-A288

Complementary Series parting and grooving tools Code Key A285
Erweiternde Serie Ab- & Einstechwerkzeug ISO Kennzeichen

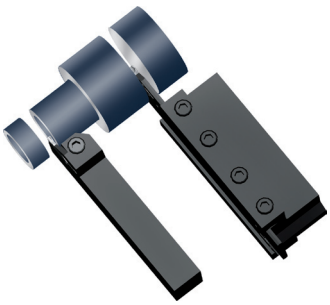
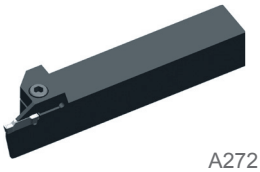
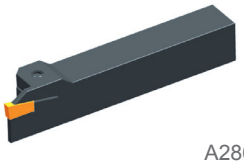
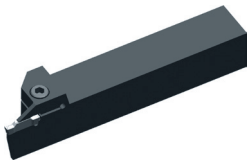
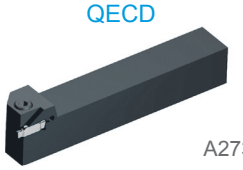
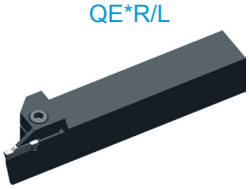
QZQ External grooving Series · Außenstechserie A286

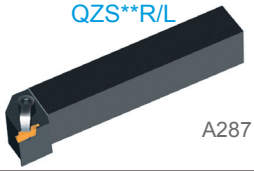
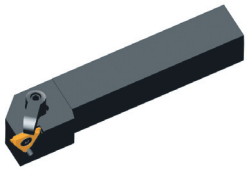
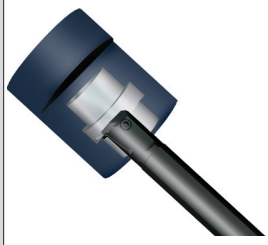
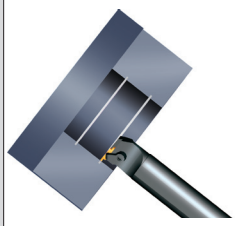
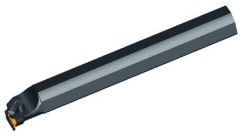
QZS Internal grooving Series · Innenstechserie A286

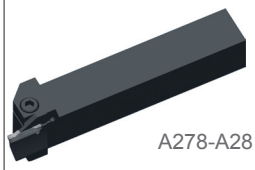
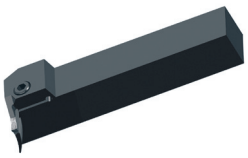
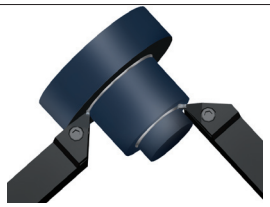
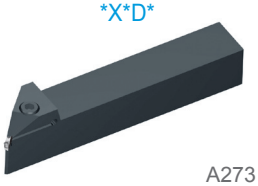
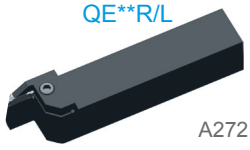
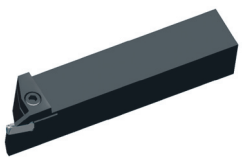
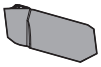
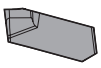
QZS External grooving Series · Außenstechserie A287

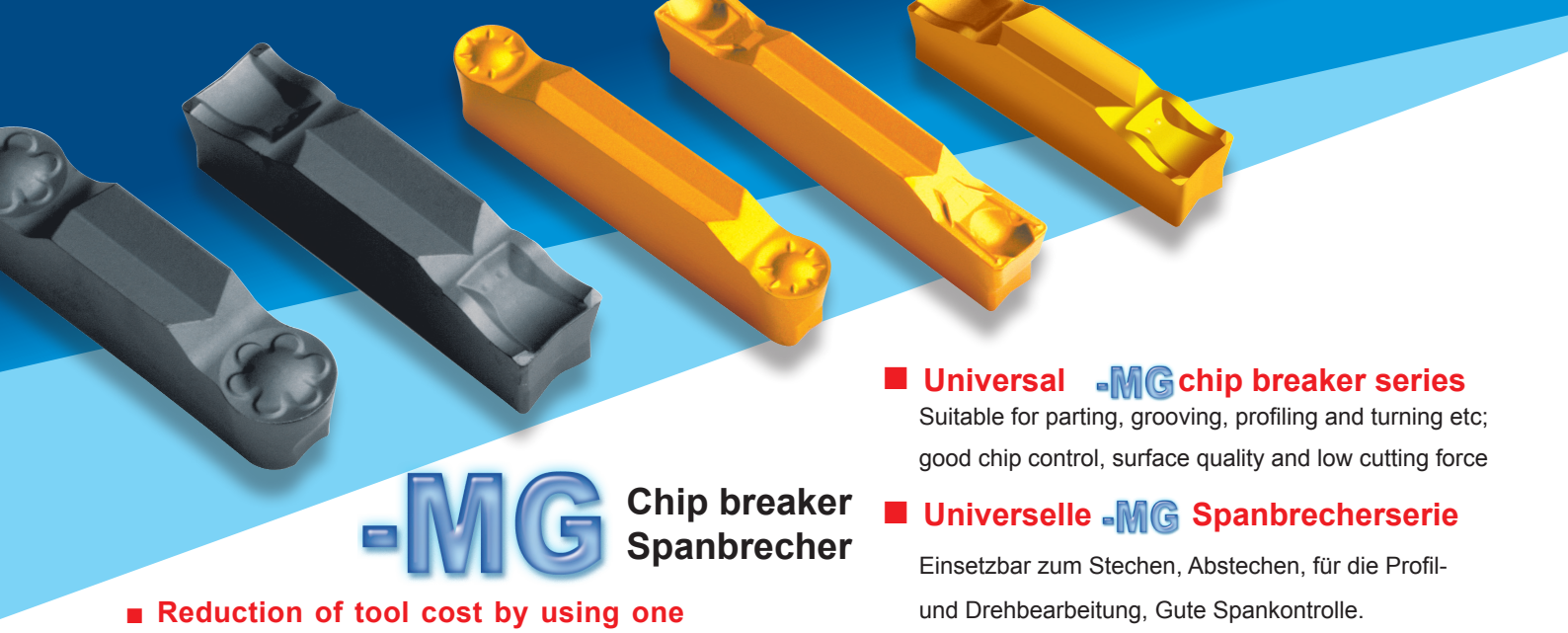
QT External grooving· Außenstechserie **A288**

Application information of parting and grooving **A289-A290**
Anwendungsinformation für Ab- & Einstechen

Machining application	Machining Bearbeitung		Toolholder Klemmhalter	Inserts Stechplatten	Tool's feature and parameters Werkzeug Eigenschaften & Parameter
External machining · Außenbearbeitung	Parting · Abstechen		"Squirrel Series" QZ**+QE**  A275	ZP*S** 	• Assemble structure of parting blade and holder, good rigidity and parting range is adjustable. • The max. parting Ø = 120mm. • Die Auskragung des Abstech-Schwertes ist bei hoher Stabilität einstellbar • Der max. Abstech Ø = 120mm
			"Squirrel Series" QE**R/L  A272	ZP**D*  ZP*S* 	• Inserts have 3d chip breaker, small cutting force, good performance on chip breaking • maximum parting Ø = 60mm • Schneideinsatz mit 3 versch. Spanleitstufen für geringe Schnittkräfte & gute Spankontrolle. • max. Abstech Ø = 120 mm
			Complementary series QZQ*R/L  A286	ZQMX** 	• Cutting edge strength is suitable for bad machining conditions • The maximum parting Ø = 70mm • Stabile Schneidkante für den Einsatz bei ungünstigen Bearbeitungsbedingungen • Der max. Abstech Ø = 70 mm
	Grooving and turning Stechen und Drehen		"Squirrel Series" QE*R/L  A247	Double / Doppelseitig ZT*D**  Profile turning/ Profildrehen ZR*D*  Single cutting edge for deep grooving/ Einseitig ZT*S* 	• Various applications can be realised by one single tool, installed with different inserts for grooving, profiling and parting, It reduces the tool category. • Installed with grooving inserts, the tool realises grooving and transverse cutting. This tool is multifunctional. • The max. slot depth = 30mm. • Bei Anwendung dieses Universal WZ-System und Verwendung der unterschiedlichen Schneideinsätze können die Bearbeitungen wie; Ab-, Stechen, Profil-, Drehen druchgeführt werden • Die max. Nutentiefe = 30mm
	Precise grooving · Präzisionsstechdrehen		"Squirrel Series" QECD  A273	Precise grooving/ Präzisionsstechen ZT*D**-EG  Edge width1.2~2.4mm	• Grinded insert, used for precise grooving. • Edge width can be any size between 1.0-6.5mm according to customers requirement. • ZT*D*-EG inserts: When edge width is between 1.2-2.4mm, the maximum cutting depth is 2.5mm; When edge width is >2.4~6.5mm, the maximum cutting depth is 22mm • geschliffene Einsätze für das Präzisionsstechen • Die Schneidenbreite kann auf Wunsch zwischen 1.0-6.5mm geschliffen werden. • ZT*D*-EG Stechplatte: bei S.-Breiten von 1.2-2.4mm, und max. Schnitttiefe von 2.5mm; bei S.-Breiten von >2.4~6.5mm, beträgt die max Schnitttiefe 22mm
			"Squirrel Series" QE*R/L  A272	Precise grooving/ Präzisionsstechen ZT*D**-EG  Edge width1.2~2.4mm Stechbreite	

Machining application	Machining Bearbeitung		Toolholder Klemmhalter	Inserts Stechplatten	Tool's feature and parameters Werkzeug Eigenschaften & Parameter
External Machining Außenbearbeitung	Grooving Stechen		Complementary series QZS**R/L  A287	ZSMF** 	• Fine grinded inserts, high precision • Cutting edge can be machined 1.1-5.0mm • The max. depth of slot = 6mm • Geschliffene Einsätze für hohe Präzision • Schneidenbreite zwisch. 1,1-5,0mm • Die max. Stechtiefe = 6 mm
			Complementary series QT*R/L  A288	154.3** 154.3** 	• Top and hole clamping • Sharp cutting edge, uneasy to shake • 3 fine grinded cutting edge, good economic character • Used for grooving, the slot width = 1.1-5.5mm • The max. cutting depth = 5mm • Pratzen- & Lochklemmung • Scharfe Schneidkante • 3 feingeschliffene Schneidkanten • Beim Einstechen beträgt die max. Nutenbreite zwisch. 1,1 - 5,5 mm • Die max. Schnitttiefe = 5 mm
Internal machining · Innenbearbeitung	Grooving and turning Stechen und Drtehen		"Squirrel Series" C*-Q*R/L*  A284	Grooving, Turning Stechen, Drehen ZT*D**  Profile turning ZR*D** 	• By installing different inserts for grooving & profiling, one single tool realizes various applications, it reduce the tool category. • The max. slot depth can be machined = 13mm • The min Ø can be machined = 27 mm • Ein W-System für Stech- & Profildrehen. Die Anzahl der Stechsysteme wird reduziert. • Die max. Nutentiefe = 13 mm • Der min. Ø = 27 mm
	Grooving Stechen		Complementary Series C*-QZSR/L*  A287	Grooving/ Stechen ZSMF**R/L 	• Fine grinded inserts, high precision • Slot width can be machined is 1.1-5.0mm • The min. Ø can be machined = 20mm • The max. slot depth can be machined = 6 mm • Fein geschliffener Einsatz für hohe Präzision • Nutentiefe beträgt 1,1-5 mm • Der min. Ø = 20 mm • Die max Nutentiefe = 6 mm

Machining application	Machining Bearbeitung		Toolholder Klemmhalter	Inserts Stechplatten	Tool's feature and parameters Werkzeug Eigenschaften & Parameter
Axial Grooving Axial stechen	Grooving and turning Stechen und Drehen		"Squirrel Series" QF**H  A278-A281	Grooving, Turning Stechen, Drehen ZT*D**  Profile turning ZR*D** 	• By installing different inserts as for grooving and profiling, one single tool realises various applications, it reduces the tool category. • Grooving· Stech Ø 48-400mm • Grooving depth· Nutentiefe 10-30mm • Ein W-System für Stech- & Profildrehen. Die Anzahl der Stechsysteme wird reduziert.
			"Squirrel Series" QF**L  A282-A283	Grooving, Turning ZT*D**  Profile turning ZR*D** 	• 90° toolholder, top clamping • By installing different inserts as for grooving and profiling, one single tool realizes various applications, it reduce the tool category. • Grooving· Stech Ø 48-400mm • Grooving depth· Nutentiefe 10-30mm • Ein W-System für Stech- & Profildrehen. Die Anzahl der Stech-systeme wird reduziert. • 90° Klemmhalter, Pratzenklemmung
Recess Machining Hinterstechen	Recess and turning Hinterstech. und drehen		"Squirrel Series" *X*D*  A273	Grooving, Turning ZT*D**  Profile turning ZR*D** 	• The unique tool for recess machining • Variing recess machining can be realized, inserts programm is complete • Ein W-System für Hinterstechdrehen • Unterschiedliche Hinterdrehoperationen können durchgeführt werden. Das Einsatzprogramm ist komplett.
Alu profiling Aluminium Profildrehen	External mach. Außenbearbeit.		"Squirrel Series" QE**R/L  A272	"Squirrel Series" ZR**-LH 	• The unique chip breaker for profiling Al material • Cutting edge is designed as combination of sharpness and stability, and it's suitable for continuous to intermittent cut. • Used for for external, surface and inner wall machining of Al wheelboss. • Spezielle Spanbrecher für die Alu Bearbeitung. • Schneidkante besitzt Schärfe und Stabilität für kontinuierlichen bis unterbrochenem Schnitt. • Profildrehen, von Alu. Felgen
	Inner wall and surface machining Plan & Längsprofildrehen		"Squirrel Series" C40X*  A284		
Tools for aviation and aerospace industries Werkzeuge für die Raum- & Luftfahrt	External machining Asußenbearbeitung		"Squirrel Series" QE*S*N  A274	"Squirrel Series" ZIGQ**  "Squirrel Series" ZIMF** 	• V type locating, top clamping, precisely locating, safely clamping • Inserts are suitable for difficult to machine materials like: Ni-base,Ti alloy, Stainless steel and Exotic material. • V Form Aufnahme, Top Klemmung für Präzisions-Einsatz, Fixierung & sichere Klemmung • Stechplatte für schwierig zu zerspanende Werkstoffen wie: Ni-base,Ti alloy, Stainless steel and exotic material.
	Non-standard Tools Sonderwerkzeug		Non-Standard tools , Sonderwerkzeug	Select and manufacture according to requirement. Auswahl nach Anwendung	• Instantly supply solutions for machining various parts to satisfy your machining requirement. • Sonderwerkzeuglösungen für die Bearbeitung unterschiedlicher Werkstücke.



-MG Chip breaker Spanbrecher

■ Universal -MG chip breaker series

Suitable for parting, grooving, profiling and turning etc; good chip control, surface quality and low cutting force

■ Universelle -MG Spanbrecherserie

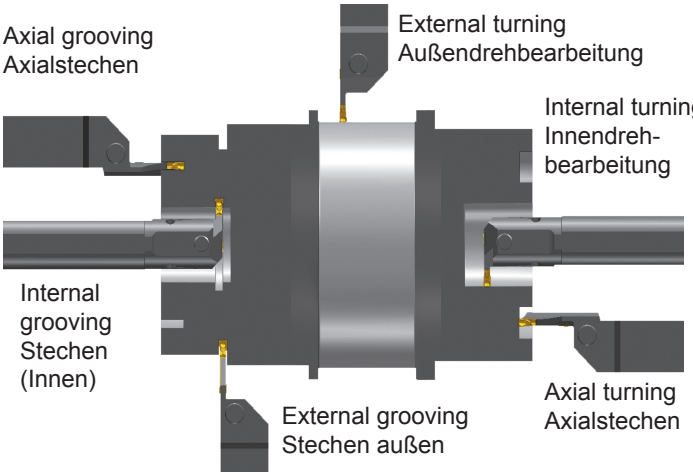
Einsetzbar zum Stechen, Abstechen, für die Profil- und Drehbearbeitung, Gute Spankontrolle.
Gute Oberflächengüten und niedrige Schnittkräfte.

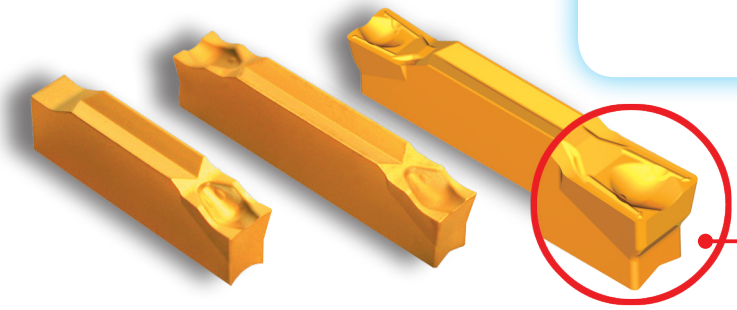
■ Reduction of tool cost by using one special design insert in various.

- One insert fits to several tool holders
- One insert suitable for serveral applications
- Reduction of tool cost and warehouse charges

■ Reduzierung der Werkzeugkosten mit dem Einsatz nur einer Stechgeometrie für viele Anwendungsbereiche.

- Stechplatte paßt auf versch. Haltersysteme
- Stechpl. geignet für versch. Bearbeitungen
- Reduzierung der Werkzeug-und Lagerkosten





Special design reduce vibration and cutting force 20%

Spezielles Spanbrecherdesign reduziert Vibrationen und Schnittkräfte um 20%

■ Unique structure design of parting inserts

- A special flank structure is designed to reduce cutting force by 20% and diminish shake, which improve the surface quality
- A special edge design requires less rigidity of machine, it can be used on machine with small power

■ Einzigartiges Schneidkantendesign für AbStechplatte

- Spezielle Flankenstruktur reduziert die Schnittkräfte um 20%, verhindert Vibrationen und verbessert die Oberflächenqualität
- Eine neu entwickelte Schneidkantenausführung ermöglicht auch den Einsatz auf leistungsschwachen Maschinen.



-EG

Precise grooving, profiling & turing inserts

Special chip breaker design, suitable for precision machining of low-carbon steel, stainless steel, adhesive materials and nonferrous metal.

Präzisions Platten für die Stech-, Profil- & Stechdrehbearbeitung

Spezielles Spanbrecherdesign für die Präzisionsbearbeitung von niedriglegiertem Stahl, rostfreiem Stahl, abrasiven Materialien und Ne-Metallen.

The edge width between

1.0-6.5mm according to your requirement.

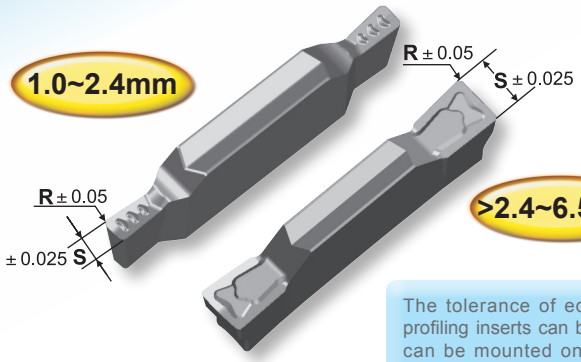
Stechbreiten von 1.0-6.5 mm je nach Anforderung.

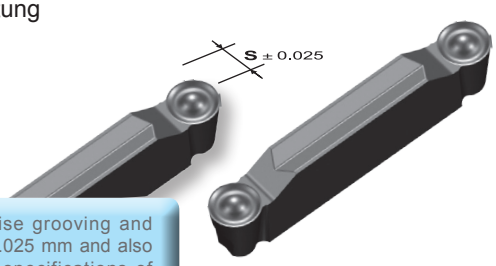
-EG Precision profiling and turning inserts

"Squirrel Series" round Inserts for precision, turing and grooving

-EG Präzisions, Profil- & DrehStechplatte

Stechplatte mit Rundprofil für die Profil, Drehstech- und Stechbearbeitung





The tolerance of edge width S of precise grooving and profiling inserts can be produced up to ±0.025 mm and also can be mounted on the corresponding specifications of original toolholder series.

Die Stechbreite S kann mit einer Toleranz bis ±0,025 mm produziert werden und auf der Standard Halterserie eingesetzt werden.

Profiling turning inserts for AL
Profilstechdrehplatten für Alu

The unique chip breaker for aluminum profiling machining. Cutting edge is designed by combining sharpness and intensity, The special chip breaker structure which effectively reduces the frictional coefficient between chips and rake face, enable the inserts suitable for continuous and intermittent profiling Al alloy Machining.

Das einzigartige Spanbrecherdesign für die Profilbearbeitung von Aluminium verbindet eine scharfe Schneidkantenausführung und gleichzeitige Stabilität. Die spezielle Form verhindert die Aufbauschneidenbildung und ist für die Bearbeitung im glatten und leicht unterbrochenem Schnitt einsetzbar.



LH



Parting, Grooving, Profiling and Turning Code Key
Kennzeichnung für Ab- und Einstechen, Profildrehen und Drehen

Application of insert *Anwendung*

- **ZP** Parting — Abstechen
- **ZT** Grooving and Turning — Einstechen und Drehen
- **ZR** Profile machning — *Formdrehen*

Code of insert seat size *Plattensitzgröße*

Corresponding code of toolholder and width of cutting edge.

Entsprechender Code des Halters und der Schneidenbreite

Code	Height / Höhe
E	2.5
F	3.0
G	4.0
H	5.0
K	6.0

Number of cutting edge *Anzahl Schneiden*

- **S** Single cutting edge — eine Schneide
- **D** Double cutting edges — Zwei Schneiden

Tolerance class *Toleranzklasse*

- **M** Tolerance class — Toleranzklasse
- **E** Tolerance class — Toleranzklasse

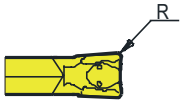
ZP G D 04 04 - M G

Width of cutting edge *Schneidplattenbreite*



025 = 0.25 mm
03 = 0.30 mm
04 = 0.40 mm
05 = 0.50 mm
06 = 0.60 mm

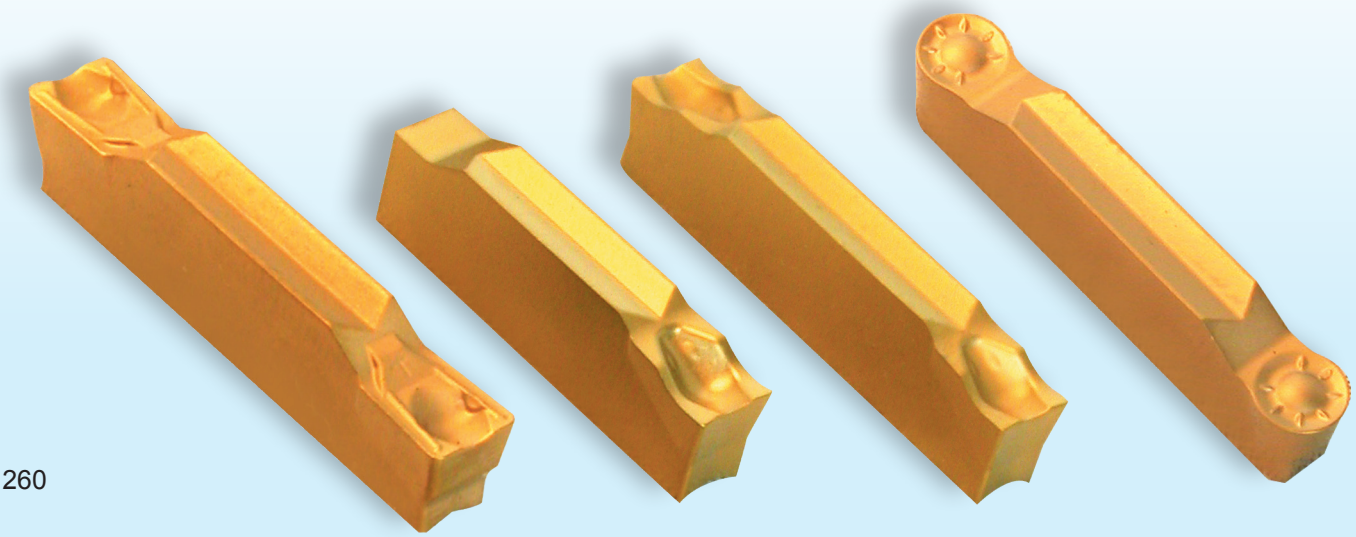
Corner radius *Eckenradius*



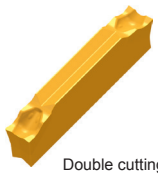
02 = 0.20 mm
03 = 0.30 mm
04 = 0.40 mm
08 = 0.80 mm

Chip breaker´s code *Spanbrecher*

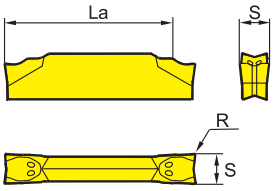
- **G** General chip breaker, suitable for all kinds of machined material. — Allgemeiner Spanbrecher, geeignet für verschiedene Materialien.
- **F** Special chip breaker — *Sonder Spanbrecher*

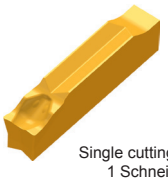


Parting inserts · Stechplatte

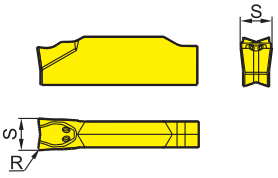


Double cutting edge
2 Schneiden





Single cutting edge
1 Schneide

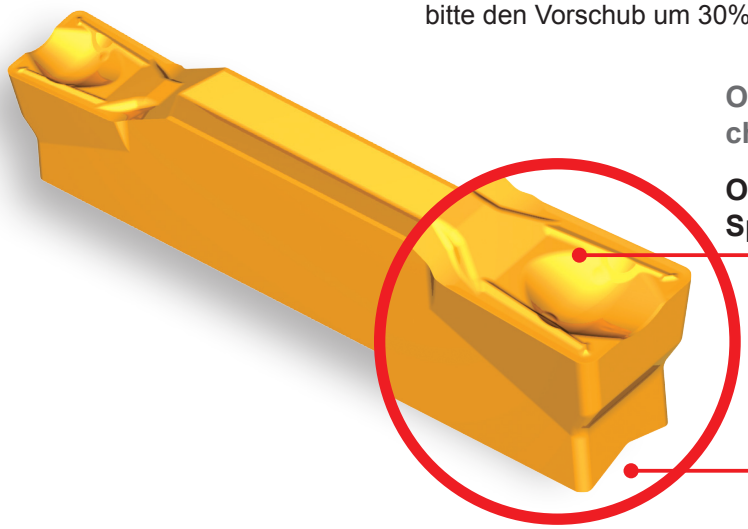


Type · Typ		Dimension (mm) Abmessung			Grade · Sorte						
					P			M		K	N
		$S^{+0.1}_{0}$	R±0.1	La max	YBG202	YGB302	YBC251	YBG202	YBG302	YBG302	YD101
Double cutting edge 2 Schneiden	**ZPED02502-MG**	2.5	0.2	17	●	●	●	●	●	●	
	ZPFD0302-MG	3.0	0.2	17	●	●	●	●	●	●	
	ZPGD0402-MG	4.0	0.2	22	●	●	●	●	●	●	
	ZPHD0503-MG	5.0	0.3	22	●	●		●	●	●	
	ZPKD0604-MG	6.0	0.4	22	●	●	●	●	●	●	
Single cutting edge 1 Schneide	**ZPES02502-MG**	2.5	0.2		○	●	●	○	●	●	
	ZPFS0302-MG	3.0	0.2		○	●	○	○	●	●	
	ZPGS0402-MG	4.0	0.2		○	●	○	○	●	●	
	ZPHS0503-MG	5.0	0.3		○	●	○	○	●	●	
	ZPKS0604-MG	6.0	0.4		●	●		●	●	●	

Insert with single cutting edge only be used to parting blad
Zum Abstechen nur mit Spannblock

Please reduce the feed rate by 30% when the insert is approaching the centre of workpiece.

Für eine längere Standzeit der Wendeschneidplatten, reduzieren Sie bitte den Vorschub um 30%, wenn die Platte sich dem Zentrum nähert.



Optimal chip breaker design for good chip control.

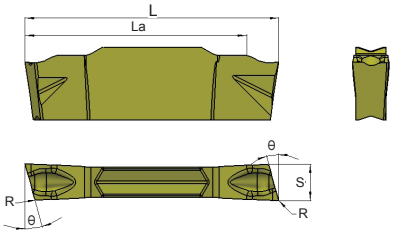
Optimaler Spanbrecher für eine gute Spankontrolle.

Cutting force is reduced by 20% less vibration.
Reduziert die Vibrationen und die Schnittkraft um 20%

● ex stock · ab Lager ○ on demand · auf Anfrage

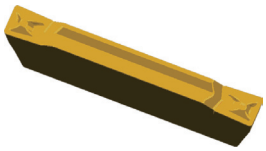
ZP*D-MG Series

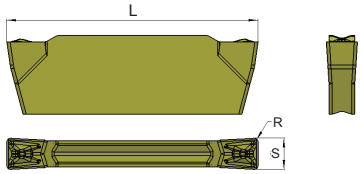




Type · Typ	Dimension (mm) Abmessung					Grade · Sorte						
						P			M		K	N
	L	S	θ	R	La_{max}	YBG202	YBG302		YBG202	YBG302	YBG302	YD101
ZPED02502-MG-6L	20	2.35	6	0.2	17	●	●		●	●	●	○
ZPED02502-MG-6R	20	2.35	6	0.2	17	●	●		●	●	●	○
ZPED02502-MG-15L	20	2.35	15	0.2	17	●	●		●	●	●	○
ZPED02502-MG-15R	20	2.35	15	0.2	17	●	●		●	●	●	○
ZPFD0302-MG-6L	20	2.85	6	0.2	17	●	●		●	●	●	○
ZPFD0302-MG-6R	20	2.85	6	0.2	17	●	●		●	●	●	○
ZPFD0302-MG-15L	20	2.85	15	0.2	17	●	●		●	●	●	○
ZPFD0302-MG-15R	20	2.85	15	0.3	17	●	●		●	●	●	○

ZTBD-MG Series

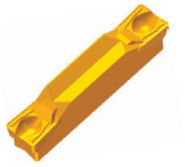




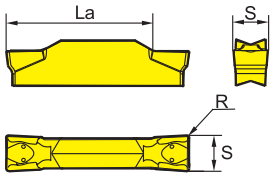
Type · Typ	Dimension (mm) Abmessung					Grade · Sorte		
	L	S ±0.05	R	La_{max}		YBG202	YBG302	
ZTBD02002-MG	16.3	2.0	0.2	13		○	○	

● ex stock · ab Lager ○ on demand · auf Anfrage

Grooving and turning inserts · Einstech- & Drehplatten

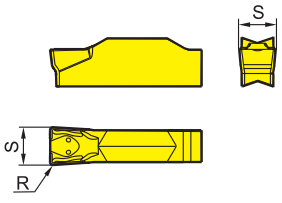


Double cutting edge
2 Schneiden



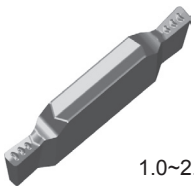


Single cutting edge
1 Schneide

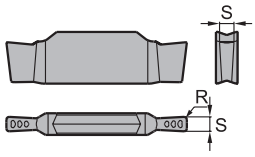


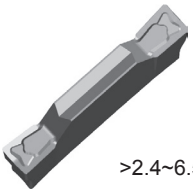
Type · Typ		Dimension (mm) Abmessung			Grade · Sorte						
					P			M		K	N
		$S^{+0.1}_{0}$	R±0.10	La max	YBG202	YGB302		YBG202	YBG302	YBG302	YD101
Double cutting edge 2 Schneiden	**ZTED02503-MG**	2.5	0.3	17	●	●		●	●	●	
	ZTFD0303-MG	3.0	0.3	17	●	●		●	●	●	
	ZTGD0404-MG	4.0	0.4	22	●	●		●	●	●	
	ZTHD0504-MG	5.0	0.4	22	●	●		●	●	●	
	ZTKD0608-MG	6.0	0.8	22	●	●		●	●	●	
Single cutting edge 1 Schneide	**ZTHS0504-MG**	5.0	0.4		○	●			●	●	
	ZTKS0608-MG	6.0	0.8		○	●			●	●	

Precise grooving and turning inserts · Präzisions Stech- & Drehplatten

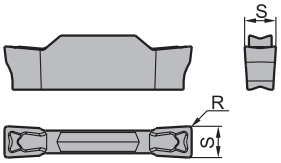


1.0~2.4mm





>2.4~6.5mm



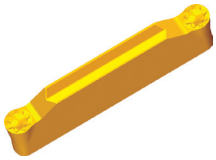
Type · Typ		Dimension (mm) Abmessung			Grade · Sorte						
					P			M		K	N
		S±0.025	$R^{(2)}$±0.05	La max	YBG202	YGB302		YBG202	YBG302	YBG302	YD101
Double cutting edge 2 Schneiden	**ZTC****-EG**	1.0~1.6	(2)	2.6		○			○		
		1.6~2.4		3.4							
	ZTE**-EG**	2.4~3.0		17		○			○		
	ZTFD**-EG**	3.0~3.8		17		○			○		
	ZTGD**-EG**	3.8~4.8		22		○			○		
	ZTHD**-EG**	4.8~5.8		22		○			○		
	ZTKD**-EG**	5.8~6.5		22		○			○		

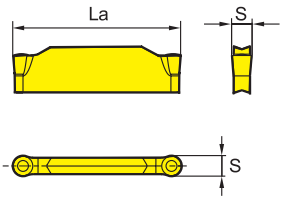
Note: (1) The code indicated with * is to be designated based on the edge width and edge radius. The code will be ZTFD03503-EG if the ordered insert is with an edge width of 3.5mm and an edge radius of 3.0mm.
(2) Edge radius R is based on customers' requirements

Der Bestellnummernschlüssel: (1) z.B. ZTFD03503-EG legt ein Schneidbreite 3.5mm und einen Schneideckenradius 0.3mm fest.
(2) Eckenradius nach Kundenwunsch

● ex stock · ab Lager ○ on demand · auf Anfrage

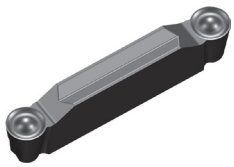
Profiling and turing inserts · Profil- & Stechdrehplatten

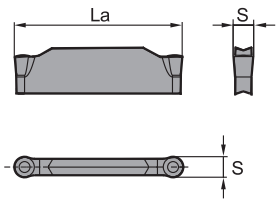




	Type · Typ	Dimension (mm) Abmessung		Grade · Sorte						
				P			M		K	N
		$S^{+0.1}_{0}$	La max	YBG202	YGB302		YBG202	YBG302	YBG302	YD101
Double cutting edge 2 Schneiden	**ZRED025-MG**	2.5	20	●	●		●	●	●	
	ZRFD03-MG	3.0	20	●	●		●	●	●	
	ZRGD04-MG	4.0	25	●	●		●	●	●	
	ZRHD05-MG	5.0	25	●	●		●	●	●	
	ZRKD06-MG	6.0	25	●	●		●	●	●	

Precise profiling and turning inserts · Präzisions, Profil- & Stechdrehplatten

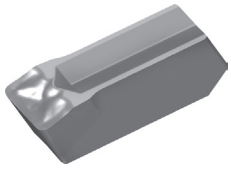


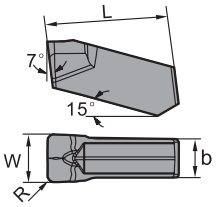


	Type · Typ	Dimension (mm) Abmessung		Grade · Sorte						
				P			M		K	N
		S±0.025	La max	YBG202	YGB302		YBG202	YBG302	YBG302	YD101
Double cutting edge 2 Schneiden	**ZRFD03- EG**	3.0	20		○			○		
	ZRGD04- EG	4.0	25		○			○		
	ZRHD05-EG	5.0	25		○			○		
	ZRKD06-EG	6.0	25		○			○		

● ex stock · ab Lager ○ on demand · auf Anfrage

Single-cutting edge grooving and turning inserts for machining of heatresistance super alloy
Einseitige Stech- & Drehplatten für die Bearbeitung von warmfesten Superlegierung

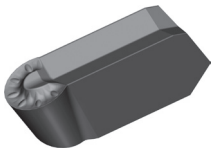


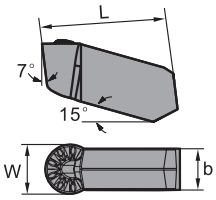


Type · Typ	Dimension (mm) Abmessung				Grade · Sorte			
					S			M
	W±0.05	R±0.1	b	L	YD101	YBG102	YBG202	YBG202
ZIMF304N-NM	3	0.4	2.4	15.3		●		
ZIMF406N-NM	4	0.6	3.2	15.3		●		
ZIMF506N-NM	5	0.6	4	15.3		●		
ZIMF608N-NM	6	0.8	4	15.3		●		

● ex stock · ab Lager ○ on demand · auf Anfrage

Single-cutting edge grooving and turning inserts for machining of heatresistance super alloy
Einseitige Stech- & Drehplatten für die Bearbeitung von warmfesten Superlegierungen

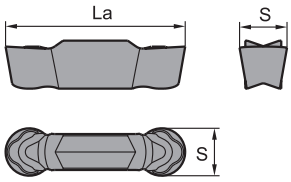




Type · Typ	Dimension (mm) Abmessung			Grade · Sorte			
				S			M
	W±0.025	b	L	YD101	YBG102	YBG202	YBG202
ZIGQ3N-NM	3	2.4	15.3		●		
ZIGQ4N-NM	4	3.2	15.3		●		
ZIGQ5N-NM	5	4	15.3		●		
ZIGQ6N-NM	6	5	15.3		●		

Profiling Inserts for Al · Profilstechdrehplatten zur Aluminiumbearbeitung



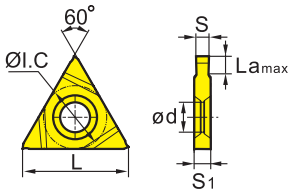


Type · Typ	Dimension (mm) Abmessung		Grade · Sorte
	S±0.025	La max	YD101
ZRKD06- LH	6.0	25	●
ZRLD08-LH	8.0	30	●

● ex stock · ab Lager ○ on demand · auf Anfrage

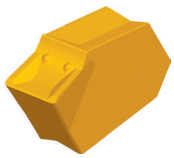
154.3 Series

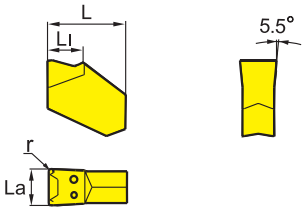




Type · Typ	Dimension (mm) Abmessung						Grade · Sorte						
							P			M			K
	L	I.C	S	S_1	d	La_{max}	YBC251	YC10	YC40	YBC251	YC10	YC40	YD201
154.3-16110	16.5	9.525	1.1	2.5	4.5	1.2		●	●		●	●	
154.3-16130	16.5	9.525	1.3	2.5	4.5	1.5		●	●		●	●	
154.3-16160	16.5	9.525	1.6	2.5	4.5	1.8		●	●		●	●	●
154.3-16185	16.5	9.525	1.85	2.5	4.5	2.8		●	●		●	●	●
154.3-16215	16.5	9.525	2.15	2.8	4.5	2.8		●	●		●	●	
154.3-16315	16.5	9.525	3.15	3.8	4.5	2.8		●	●		●	●	●

ZQMX Series

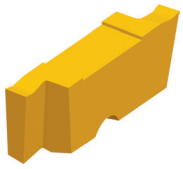


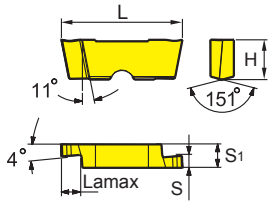


Type · Typ	Dimension (mm) Abmessung				Grade · Sorte						
					P			M			K
	L1	La	r	L	YBC251	YC10	YC40	YBC251	YC10	YC40	YD201
ZQMX3N11-1E	4.4	3.125	0.3	11	●			●			
ZQMX4N11-1E	4.95	4.125	0.3	11	●			●			
ZQMX5N11-1E	5	5.125	0.3	11	●			●			
ZQMX6N11-1E	5.28	6.4	0.3	11	●			●			
ZQMX7N11-1E	4.53	7.05	0.3	14							

● ex stock · ab Lager ○ on demand · auf Anfrage

ZSMF·ZSMX Series

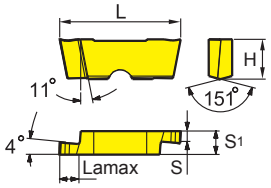




Type · Typ	Dimension (mm) Abmessung					Grade · Sorte		
						P	M	K
	L	S_1	H	La_{max}	S	YC10	YC10	YD201
ZSMF3110L	16	3.1	5.26	2.1	1.1	●	●	
ZSMF3130L	16	3.1	5.26	2.3	1.3	●	●	
ZSMF3160L	16	3.1	5.26	2.6	1.6	●	●	○
ZSMF3185L	16	3.1	5.26	2.9	1.85	●	●	○
ZSMF3215L	16	3.1	5.26	3.2	2.15	●	●	
ZSMF3265L	16	3.1	5.26	3.7	2.65	●	●	○
ZSMF5500L	22	5.1	6.26	6	5	●	●	
ZSMX8515L	27	8.1	7.26	6.2	5.15			

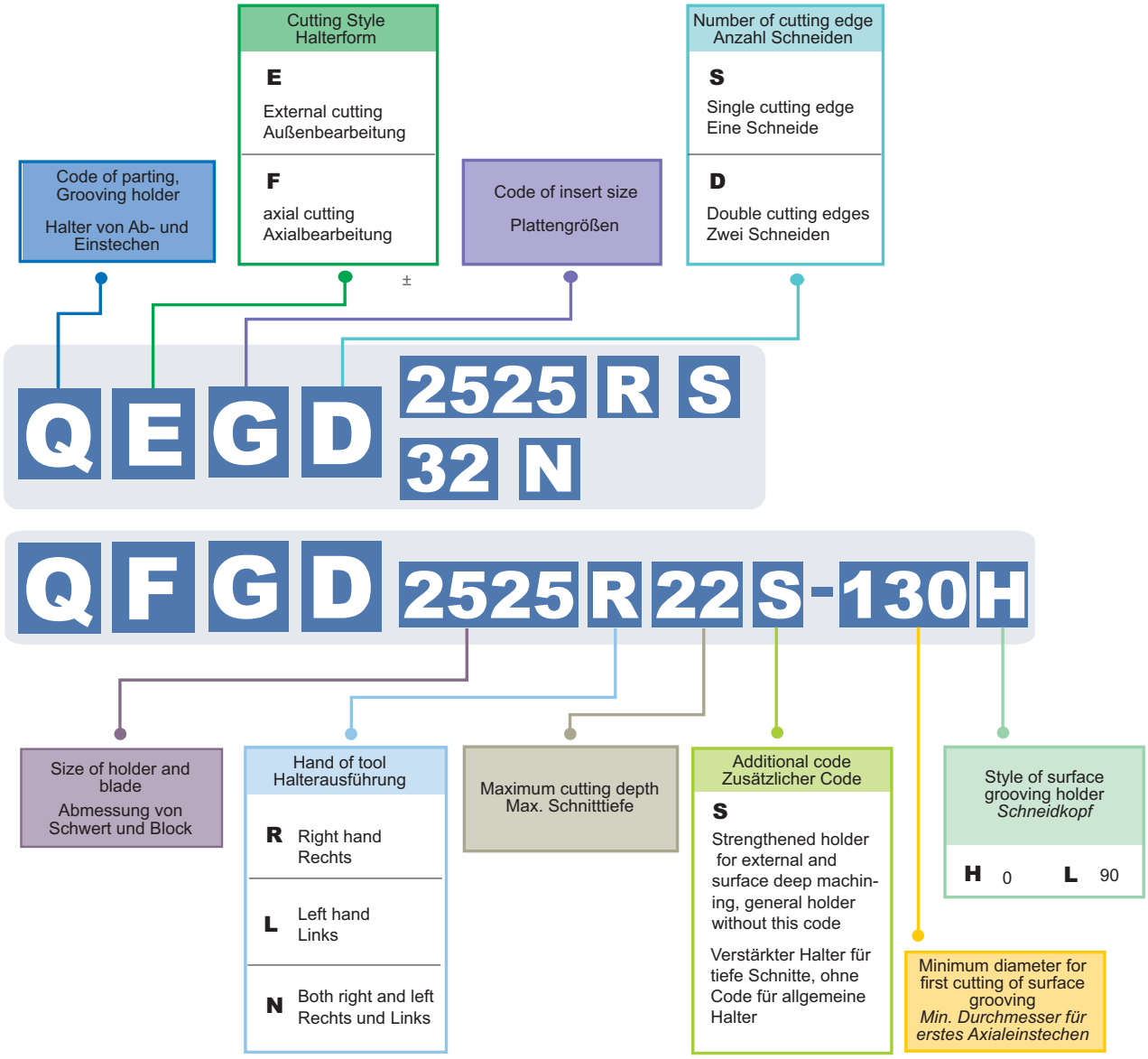
ZSMF·ZSMX Series

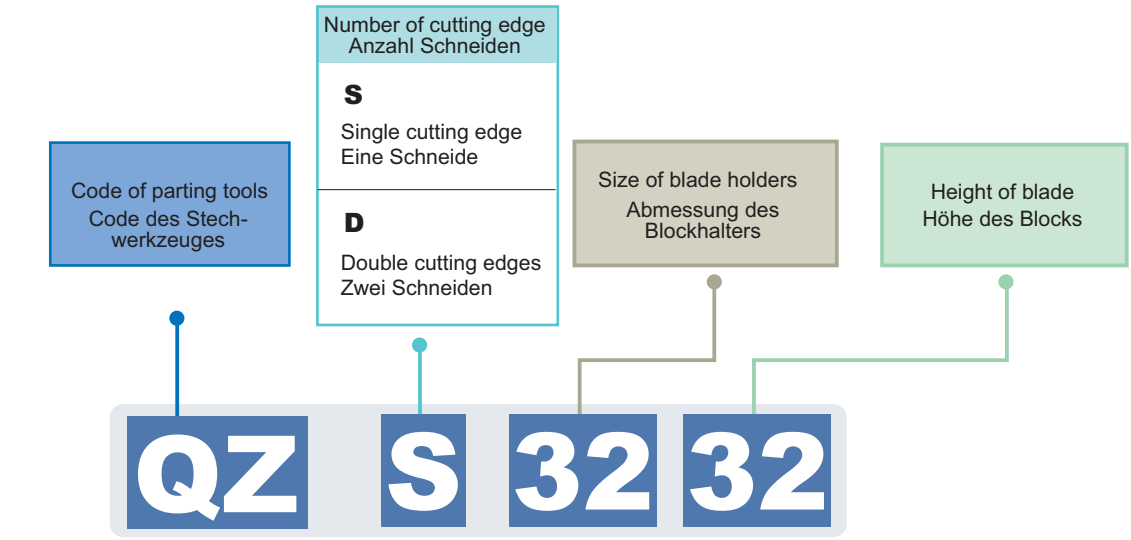


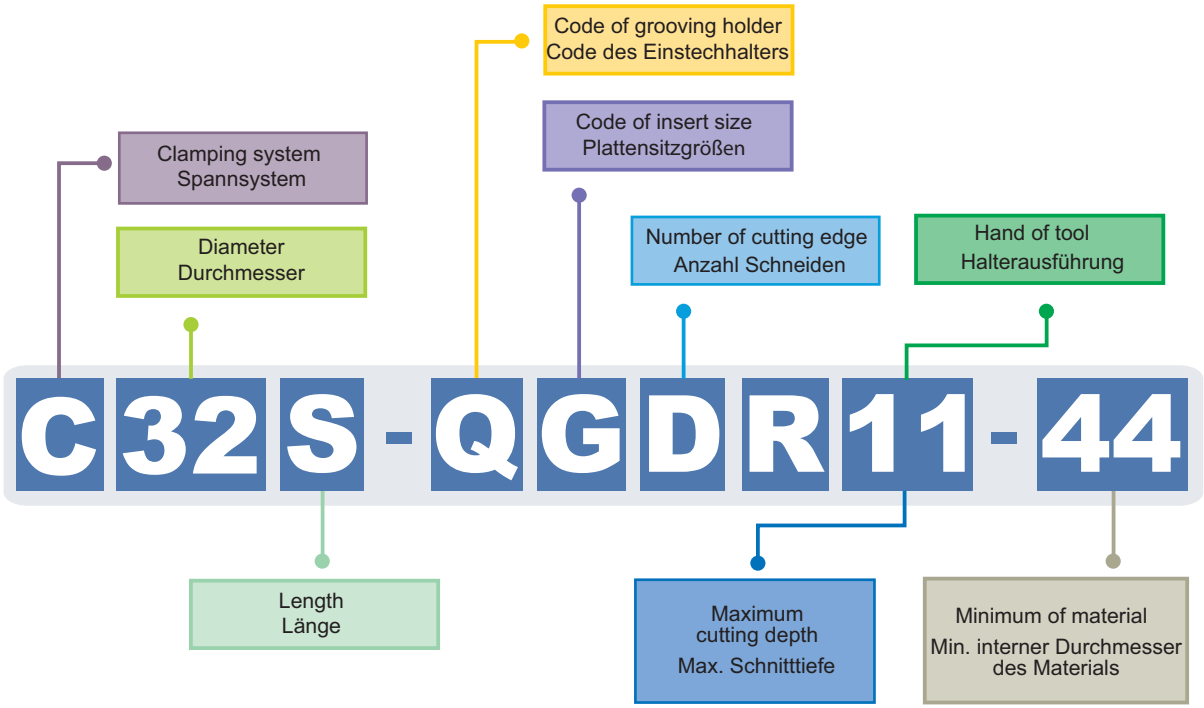


Type · Typ	Dimension (mm) Abmessung					Grade · Sorte		
						P	M	K
	L	S_1	H	La_{max}	S	YC10	YC10	YD201
ZSMF3110R	16	3.1	5.26	2.1	1.1	●	●	
ZSMF3130R	16	3.1	5.26	2.3	1.3	●	●	
ZSMF3160R	16	3.1	5.26	2.6	1.6	●	●	○
ZSMF3185R	16	3.1	5.26	2.9	1.85	●	●	
ZSMF3215R	16	3.1	5.26	3.2	2.15	●	●	○
ZSMF3265R	16	3.1	5.26	3.7	2.65	●	●	○
ZSMF5500R	22	5.1	6.26	6	5	●	●	
ZSMX8515R	27	8.1	7.26	6.2	5.15			

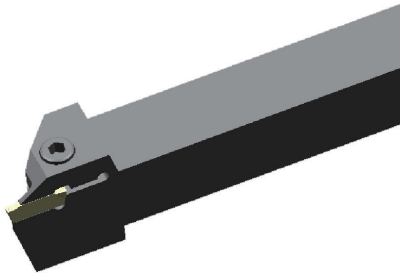
● ex stock · ab Lager ○ on demand · auf Anfrage

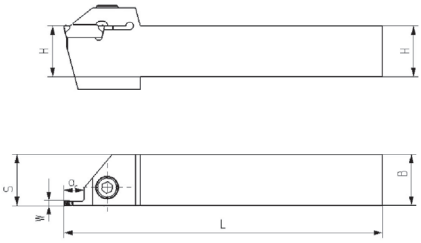

Code of parting, Grooving holder
Halter von Ab- und Einstechen
Cutting Style Halterform
E
External cutting
Außenbearbeitung
F
axial cutting
Axialbearbeitung
Code of insert size
Plattengrößen
Number of cutting edge Anzahl Schneiden
S
Single cutting edge
Eine Schneide
D
Double cutting edges
Zwei Schneiden
±
Q E G D 2525 R S 32 N
Q F G D 2525 R 22 S -130 H
Size of holder and blade
Abmessung von Schwert und Block
Hand of tool Halterausführung
R Right hand Rechts
L Left hand Links
N Both right and left Rechts und Links
Maximum cutting depth
Max. Schnitttiefe
Additional code Zusätzlicher Code
S
Strengthened holder for external and surface deep machining, general holder without this code
Verstärkter Halter für tiefe Schnitte, ohne Code für allgemeine Halter
Minimum diameter for first cutting of surface grooving
Min. Durchmesser für erstes Axialeinstechen
Style of surface grooving holder
Schneidkopf
H 0 L 90


Code of parting tools
Code des Stech-werkzeuges
Number of cutting edge
Anzahl Schneiden
S
Single cutting edge
Eine Schneide
D
Double cutting edges
Zwei Schneiden
Size of blade holders
Abmessung des Blockhalters
Height of blade
Höhe des Blocks
QZ S 32 32


Code of grooving holder
Code des Einstechhalters
Code of insert size
Plattensitzgrößen
Clamping system
Spannsystem
Diameter
Durchmesser
Number of cutting edge
Anzahl Schneiden
Hand of tool
Halterausführung
C 32 S - Q G D R 11 - 44
Length
Länge
Maximum
cutting depth
Max. Schnitttiefe
Minimum of material
Min. interner Durchmesser
des Materials

External parting, grooving and turning tools · Einstech- & Drehwerkzeuge (Außen)

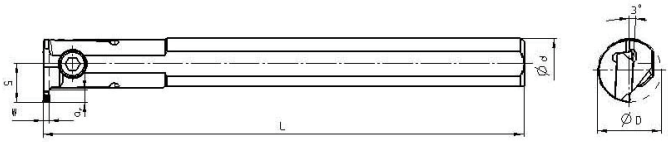




Type · Typ		Stock		Dimension (mm) Abmessung					Inserts Stechplatte	Screw Schraube	Wrench Schlüssel
		R	L	H×B	L	S	W	ar max			
QEBD	2020R/L07	●	●	20×20	150	20.17	2	7	ZTBD02002	M5×16	WH40L
	1616R/L04	●	●	16×16	150	16.17	2	4	ZTBD02002		

External parting, grooving and turning tools · Einstech- & Drehwerkzeuge (Außen)

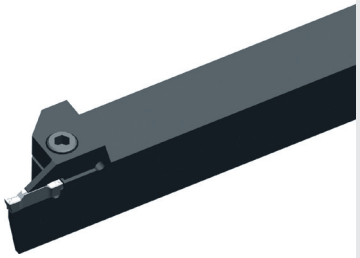


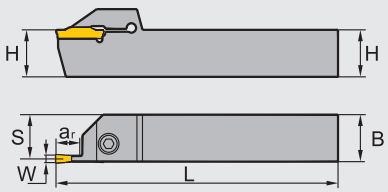


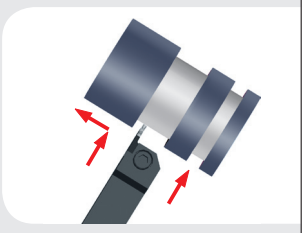
Type · Typ	Stock		Dimension (mm) Abmessung					Inserts Stechplatte	Screw Schraube	Wrench Schlüssel
	R	L	d	L	S	W	ar max			
C16M-QBDR04-20	●	●	16	150	12	2	4	ZTBD02002-MG	M5×10	WH40L
C16M-QBDL04-20	●	●	16	150	12	2	4	ZTBD02002-MG		

● ex stock · ab Lager ○ on demand · auf Anfrage

External parting, grooving and turning tools · Einstech- & Drehwerkzeuge (Außen)



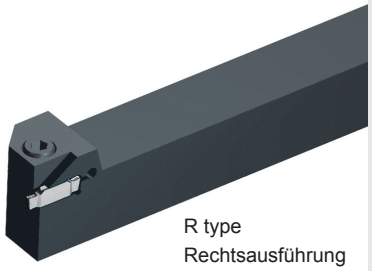




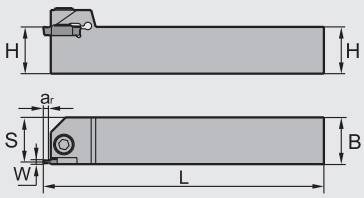
Type · Typ		Stock		Dimension (mm) Abmessung					Inserts Stechplatten	Screw Schraube	Wrench Schlüssel
		R	L	H×B	L	S	W	$a_{r\,max}$			
QEED	**1616R/L10**	●	●	16×16	125	15	2.5	10	Z*ED025**	GB70-85-M5×20	WH40L
	1616R/L17	●	●	16×16	125	15	2.5	17	Z*ED025**		
	2020R/L10	●	●	20×20	15	10	2.5	10	Z*ED025**	GB70-85-M6×20	WH50L
	2020R/L17	●	●	20×20	25	19	2.5	17	Z*ED025**		
	225R/L10	●	●	25×25	150	19	2.5	10	Z*ED025**		
	2525R/L17	●	●	25×25	150	19	2.5	17	Z*ED025**		
QEFD	**1616R/L10**	●	●	16×16	125	14.8	3	10	Z*FD03**	GB70-85-M5×20	WH40L
	1616R/L17	●	●	16×16	125	14.8	3	17	Z*FD03**		
	2020R/L10	●	●	20×20	125	18.8	3	10	Z*FD03**	GB70-85-M6×20	WH50L
	2020R/L17	●	●	20×20	125	18.8	3	17	Z*FD03**		
	2525R/L10	●	●	25×25	150	3.8	3	10	Z*FD03**		
	2525R/L17	●	●	25×25	150	23.8	3	17	Z*FD03**		
QEGD	**2020R/L13**	●	●	20×20	140	18.5	4	13	Z*FD04**	GB70-85-M6×20	WH50L
	2020R/L22	●	●	20×20	140	18.5	4	22	Z*GD04**		
	252*R/L13	●	●	25×25	150	23.5	4	13	Z*GD04**		
	2525R/L22	●	●	25×25	150	23.5	4	22	Z*GD04**		
	3232R/L13	●	●	32×32	170	30.5	4	13	Z*GD04**		
	3232R/L22	●	●	32×32	170	30.	4	22	Z*GD04**		
QEHD	**2525R/L13**	●	●	25×25	150	23	5	13	Z*HD05**	GB70-85-M6×20	WH50L
	2525R/L22	●	●	25×25	15	23	5	22	Z*HD05**		
QEHS	**2525N30**	○		25×25	150	12.5	5	30	Z*HS05**		
QEHD	**3232R/L13**	●	●	32×32	170	30.5	5	13	Z*HD05**		
	3232R/L22	●	●	32×32	170	30.5	5	22	Z*HD05**		
QEHS	**3232N30**	○		32×32	170	16	5	30	Z*HS05**		
QEKD	**2525R/L13**	●	●	25×25	150	22.6	6	13	Z*KD06**	GB70-85-M6×20	WH50L
	2525R/L22	●	●	25×25	150	22.6	6	22	Z*KD06**		
QEKS	**2525N30**	○		25×25	15	12.5	6	30	Z*KS06**		
QEKD	**3232R/L13**	●	●	32×32	170	29.6	6	13	Z*KD06**		
	3232R/L22	●	●	32×32	170	29.6	6	22	Z*KD06**		
QEKS	**3232N30**	○		32×32	170	16	6	30	Z*KS06**		

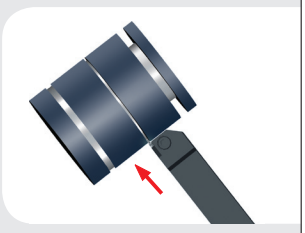
● ex stock · ab Lager ○ on demand · auf Anfrage

Precise grooving and turning tools · Präzisions Einstech- & Drehwerkzeuge



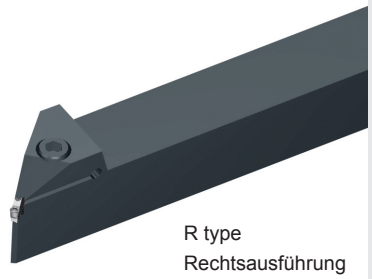
R type
Rechtsausführung



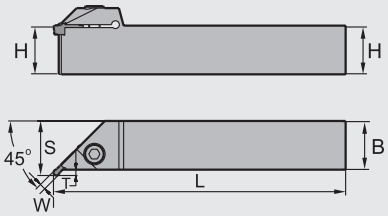


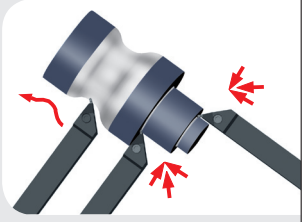
Type · Typ		Stock		Dimension (mm) Abmessung					Inserts Stechplatten	Screw Schraube	Wrench Schlüssel
		R	L	H×B	L	S	W	a_r max			
QECD	1616R/L025	○	○	16×16	125	14.75		2.5	ZT**D***-EG	GB70-85-M5×20	WH40L
	2020R/L025	○	○	20×20	125	18.75				GB70-85-M6×20	WH50L
	2525R/L025	○	○	25×25	150	23.75					

External recess and profiling turning tools · Hinterdrehstech- & Profildrehwerkzeuge (Außen)



R type
Rechtsausführung

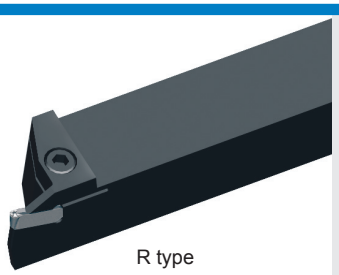




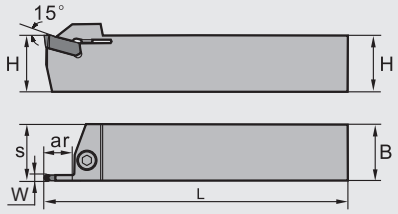
Type · Typ		Stock		Dimension (mm) Abmessung					Inserts Stechplatten	Screw Schraube	Wrench Schlüssel
		R	L	H×B	L	S	W	a_r max			
QXFD	2020R/L03-45	○	○	20×20	125	23	3.0	3.0	ZR(T)FD03-EG ZR(T)FD03-MG	GB70-85-M6×20	WH50L
	2525R/L03-45	○	○	25×25	150	28					
	3232R/L03-45	○	○	32×32	170	35					
QXGD	2020R/L03-45	○	○	20×20	125	23	4.0	3.0	ZR(T)GD04-EG ZR(T)GD04-MG		
	2525R/L03-45	○	○	25×25	150	28					
	3232R/L03-45	○	○	32×32	170	35					
QXHD	2020R/L04-45	○	○	20×20	125	24	5.0	4.0	ZR(T)HD05-EG ZR(T)HD05-MG		
	2525R/L04-45	○	○	25×25	150	29					
	3232R/L04-45	○	○	32×32	170	36					
QXKD	2020R/L04-45			20×20	125	24	6.0	4.0	ZR(T)KD06-EG ZR(T)KD06-MG		
	2525R/L04-45	○	○	25×25	150	29					
	3232R/L04-45	○	○	32×32	170	36					

● ex stock · ab Lager ○ on demand · auf Anfrage

External grooving tools for difficult machining
Stechdrehwerkzeug für die schwierige Bearbeitung (Außen)



R type
Rechtsausführung

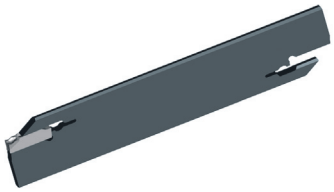


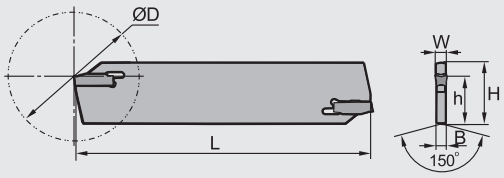


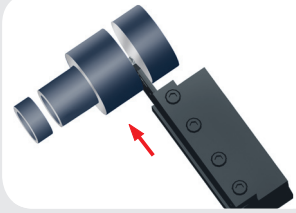
Type · Typ		Stock		Dimension (mm) Abmessung					Inserts Stechplatten	Screw Schraube	Wrench Schlüssel
		R	L	H×B	L	S	W	ar max			
QEFS	2525R/L12-3N	○	○	25×25	150	25.3	3	12	ZIGQ3N-NM ZIMF304N-NM	GB70-85-M6×20	WH50L
	3232R/L22-3N	○	○	32×32	170	32.3	3	22			
QEGS	2525R/L12-4N	○	○	25×25	150	25.3	4	12	ZIGQ4N-NM ZIMF406N-NM		
	3232R/L22-4N	○	○	32×32	170	32.3	4	22			
QEHS	2525R/L12-5N	○	○	25×25	150	25.4	5	12	ZIGQ5N-NM ZIMF506N-NM		
	3232R/L22-5N	○	○	32×32	170	32.4	5	22			
QEKS	2525R/L12-6N	○	○	25×25	150	25.4	6	12	ZIGQ6N-NM ZIMF608N-NM		
	3232R/L22-6N	○	○	32×32	170	32.4	6	22			

● ex stock · ab Lager ○ on demand · auf Anfrage

Blade for external parting · Abstechschwert zur Außenbearbeitung

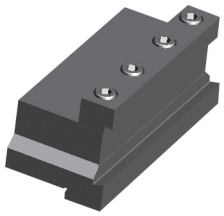


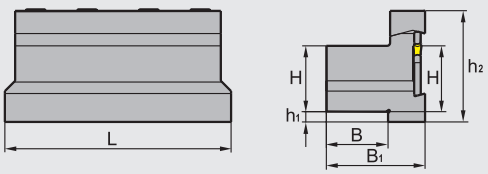


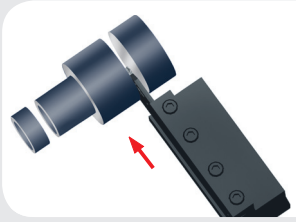


Type · Typ	Stock	Dimension (mm) Abmessung						Inserts Stechplatten	Wrench Schlüssel
		L	H	h	B	W	ØD max		
QEES26N	●	110	26	19	2	2.5	60	ZPES02502-MG	W50RL
QEFS26N	●	110	26	19	2.4	3	60	ZPFS0302-MG	
QEGS26N	●	110	26	19	3.2	4	70	ZPGS0402-MG	
QEHS26N	○	110	26	19	4	5	70	ZPHS0503-MG	
QEKS26N	○	110	26	19	5	6	70	ZPKS0604-MG	
QEES32N	●	150	32	24.6	2	2.5	100	ZPES02502-MG	
QEFS32N	●	150	32	24.6	2.4	3	100	ZPFS0302-MG	
QEGS32N	●	150	32	24.6	3.2	4	120	ZPGS0402-MG	
QEHS32N	●	150	32	24.6	4	5	120	ZPHS0503-MG	
QEKS32N	●	150	32	24.6	5	6	120	ZPKS0604-MG	

Holder for external parting · Spannblock zur Außenbearbeitung



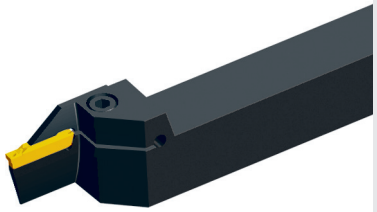




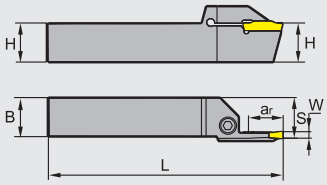
Type · Typ	Stock	Dimension (mm) Abmessung						Clamp Klemme	Screw Schraube	Wrench Schlüssel
		L	H	h_1	h_2	B	B_1			
QZS2026	●	86	20	10	46.6	19	38	QZC26	GB70-85-M6×20	WH50L
QZS2526	●	86	25	5	46.6	23	42	QZC26		
QZS3226	●	86	30	3	51.6	30	48	QZC26		
QZS2032	○	110	20	13	50	19	38	QZC32		
QZS2532	●	110	25	8	50	23	42	QZC32		
QZS3232	●	110	32	5	54	30	48	QZC32		

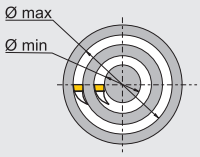
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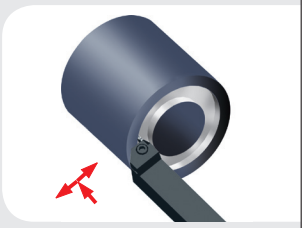


R type
Rechtsausführung





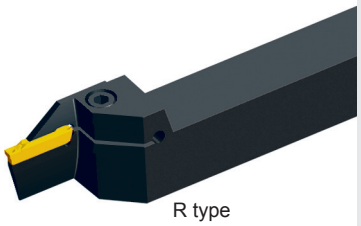
ØD= Range of entering
ØD= Bereich



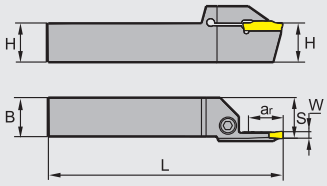
Type · Typ		Stock		Dimension (mm) Abmessung						Inserts Stechplatten	Screw Schraube	Wrench Schlüssel
		R	L	H×B	L	S	W	ar max	ØD (min-max)			
QFFD	2020R/L7-48H	○	○	20×20	150	21	3	7	48-66	ZTFD0303-MG	GB70-85-M6×20	WH50L
	2020R/L10-48H	○	○	20×20	150	21	3	10	48-66			
	2525R/L10-48H	●	●	25×25	150	26	3	10	48-66			
	2525R/L17-48H	●	●	25×25	150	26	3	17	48-66			
	2020R/L7-60H	○	○	20×20	150	21	3	7	60-80			
	2020R/L10-60H	○	○	20×20	150	21	3	10	60-80			
	2525R/L10-60H	●	●	25×25	150	26	3	10	60-80			
	2525R/L17-60H	●	●	25×25	150	26	3	17	60-80			
	2020R/L7-74H	○	○	20×20	150	21	3	7	74-110			
	2020R/L10-74H	○	○	20×20	150	21	3	10	74-110			
	2525R/L10-74H	●	●	25×25	150	26	3	10	74-110			
	2525R/L17-74H	●	●	25×25	150	26	3	17	74-110			
	2020R/L7-100H	○	○	20×20	150	21	3	7	100-150			
	2020R/L10-100H	○	○	20×20	150	21	3	10	100-150			
	2525R/L10-100H	●	●	25×25	150	26	3	10	100-150			
	2525R/L17-100H	●	●	25×25	150	26	3	17	100-150			
QFGD	2020R/L10-52H	○	○	20×20	150	21	4	10	52-72	ZTGD0404-MG		
	2525R/L13-52H	●	●	25×25	150	26	4	13	52-72			
	2020R/L15-52H	○	○	20×20	150	21	4	15	52-72			
	2525R/L22-52H	●	●	25×25	150	26	4	22	52-72			
	2020R/L10-64H	○	○	20×20	150	21	4	10	64-100			
	2525R/L13-64H	●	●	25×25	150	26	4	13	64-100			
	2020R/L15-64H	○	○	20×20	150	21	4	15	64-100			
	2525R/L22-64H	●	●	25×25	150	26	4	22	64-100			
	2020R/L10-90H	○	○	20×20	150	21	4	10	90-140			
	2525R/L13-90H	●	●	25×25	150	26	4	13	90-140			
	2020R/L15-90H	○	○	20×20	150	21	4	15	90-140			
	2525R/L22-90H	●	●	25×25	150	26	4	22	90-140			
	2020R/L10-130H	○	○	20×20	150	21	4	10	130-230			
	2525R/L13-130H	●	●	25×25	150	26	4	13	130-230			
	2020R/L15-130H	○	○	20×20	150	21	4	15	130-230			
	2525R/L22-130H	●	●	25×25	150	26	4	22	130-230			

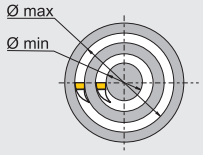
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R type
Rechtsausführung





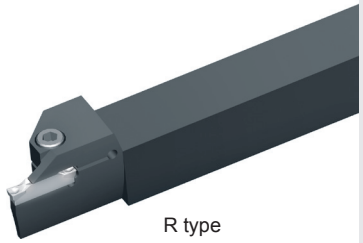
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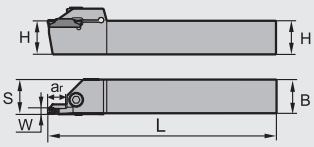
Type · Typ		Stock		Dimension (mm) Abmessung						Inserts Stechplatten	Screw Schraube	Wrench Schlüssel
		R	L	H×B	L	S	W	$a_{r\,max}$	ØD (min-max)			
QFHD	**2525R/L13-58H**	●	●	25×25	150	26	5	13	58-96	ZTHD0504-MG	GB70-85-M6×20	WH50L
	2525R/L22-58H	●	●	25×25	150	26	5	22	58-96			
	2525R/L13-86H	●	●	25×25	150	26	5	13	86-140			
	2525R/L22-86H	●	●	25×25	150	26	5	22	86-140			
	2525R/L13-130H	●	●	25×25	150	26	5	13	130-200			
	2525R/L22-130H	●	●	25×25	150	26	5	22	130-200			
	2525R/L13-185H	●	●	25×25	150	26	5	13	185-400			
	2525R/L22-185H	●	●	25×25	150	26	5	22	185-400			
QFHS	**2525R/L30-185H**	●	●	25×25	150	26	5	30	185-400	ZTHS0504-MG		
QFKD	**2525R/L13-60H**	●	●	25×25	150	26	6	13	60-100	ZTKD0608-MG	GB70-85-M6×20	WH50L
	2525R/L22-60H	●	●	25×25	150	26	6	22	60-100			
	2525R/L13-88H	○	●	25×25	150	26	6	13	88-180			
	2525R/L22-88H	●	●	25×25	150	26	6	22	88-180			
	2525R/L13-160H	●	●	25×25	150	26	6	13	160-400			
	2525R/L22-160H	●	●	25×25	150	26	6	22	160-400			
QFKS	**2525R/L30-160H**	●	●	25×25	150	26	6	30	160-400	ZTKS0608-MG		

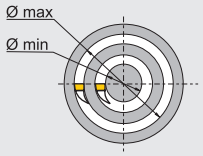
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R type
Rechtsausführung





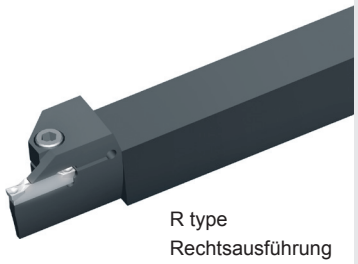
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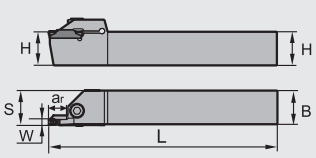
Type · Typ		Stock		Dimension (mm) Abmessung						Inserts Stechplatten	Screw Schraube	Wrench Schlüssel
		R	L	H×B	L	S	W	ar max	ØD (min-max)			
QFFD	2020RR7-48H	○	○	20×20	150	21	3	7	48-66	ZTFD0303-MG	GB70-85-M6×20	WH50L
	2020RR10-48H	○	○	20×20	150	21	3	10	48-66			
	2525RR10-48H	○	○	25×25	150	26	3	10	48-66			
	2525RR17-48H	○	○	25×25	150	26	3	17	48-66			
	2020RR7-60H	○	○	20×20	150	21	3	7	60-80			
	2020RR10-60H	○	○	20×20	150	21	3	10	60-80			
	2525RR10-60H	○	○	25×25	150	26	3	10	60-80			
	2525RR17-60H	○	○	25×25	150	26	3	17	60-80			
	2020RR7-74H	○	○	20×20	150	21	3	7	74-110			
	2020RR10-74H	○	○	20×20	150	21	3	10	74-110			
	2525RR10-74H	○	○	25×25	150	26	3	10	74-110			
	2525RR17-74H	○	○	25×25	150	26	3	17	74-110			
	2020RR7-100H	○	○	20×20	150	21	3	7	100-150			
	2020RR10-100H	○	○	20×20	150	21	3	10	100-150			
	2525RR10-100H	○	○	25×25	150	26	3	10	100-150			
	2525RR17-100H	○	○	25×25	150	26	3	17	100-150			
QFGD	2020RR10-52H	○	○	20×20	150	21	4	10	52-72	ZTGD0404-MG		
	2020RR15-52H	○	○	20×20	150	26	4	15	52-72			
	2525RR13-52H	○	○	25×25	150	21	4	13	52-72			
	2525RR22-52H	○	○	25×25	150	26	4	22	52-72			
	2020RR10-64H	○	○	20×20	150	21	4	10	64-100			
	2020RR15-64H	○	○	20×20	150	26	4	15	64-100			
	2525RR13-64H	○	○	25×25	150	21	4	13	64-100			
	2525RR22-64H	○	○	25×25	150	26	4	22	64-100			
	2020RR10-90H	○	○	20×20	150	21	4	10	90-140			
	2020RR15-90H	○	○	20×20	150	26	4	15	90-140			
	2525RR13-90H	○	○	25×25	150	21	4	13	90-140			
	2525RR22-90H	○	○	25×25	150	26	4	22	90-140			
	2020RR10-130H	○	○	20×20	150	21	4	10	130-230			
	2020RR15-130H	○	○	20×20	150	26	4	15	130-230			
	2525RR13-130H	○	○	25×25	150	21	4	13	130-230			
	2525RR22-130H	○	○	25×25	150	26	4	22	130-230			

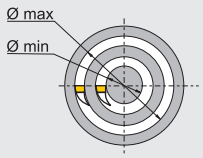
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R type
Rechtsausführung





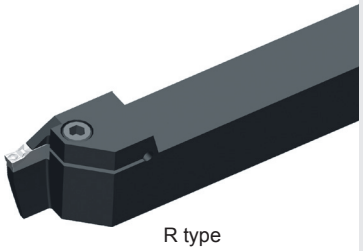
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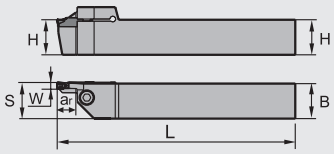
Type · Typ		Stock		Dimension (mm) Abmessung						Inserts Stechplatten	Screw Schraube	Wrench Schlüssel
		R	L	H×B	L	S	W	$a_{r\,max}$	ØD (min-max)			
QFHD	**2525RR13-58H**	○	○	25×25	150	26	5	13	58-96	ZTHD0504-MG	GB70-85-M6×20	WH50L
	2525RR22-58H	○	○	25×25	150	26	5	22	58-96			
	2525RR13-86H	○	○	25×25	150	26	5	13	86-140			
	2525RR22-86H	○	○	25×25	150	26	5	22	86-140			
	2525RR13-130H	○	○	25×25	150	26	5	13	130-200			
	2525RR22-130H	○	○	25×25	150	26	5	22	130-200			
	2525RR13-185H	○	○	25×25	150	26	5	13	185-400			
	2525RR22-185H	○	○	25×25	150	26	5	22	185-400			
QFHS	**2525RR30-185H**	○	○	25×25	150	26	5	30	185-400	ZTHS0504-MG		
QFKD	**2525RR13-60H**	○	○	25×25	150	26	6	13	60-100	ZTKD0608-MG	GB70-85-M6×20	WH50L
	2525RR22-60H	○	○	25×25	150	26	6	22	60-100			
	2525RR13-88H	○	○	25×25	150	26	6	13	88-180			
	2525RR22-88H	○	○	25×25	150	26	6	22	88-180			
	2525RR13-160H	○	○	25×25	150	26	6	13	160-400			
	2525RR22-160H	○	○	25×25	150	26	6	22	160-400			
QFKS	**2525RR30-160H**	○	○	25×25	150	26	6	30	160-400	ZTKS0608-MG		

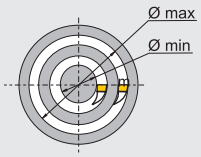
● ex stock · ab Lager ○ on demand · auf Anfrage

Axial grooving and turning tools · Axialstech- & Drehwerkzeug

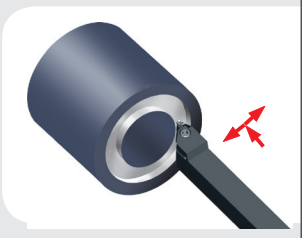


R type
Rechtsausführung





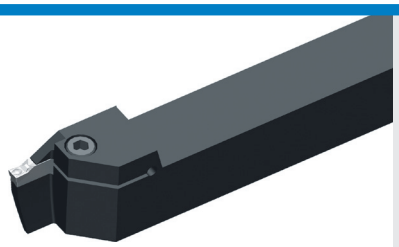
ØD= Range of entering
ØD= Bereich



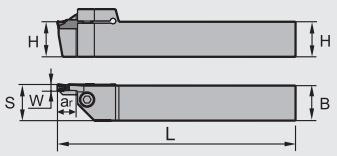
Type · Typ		Stock		Dimension (mm) Abmessung						Inserts Stechplatten	Screw Schraube	Wrench Schlüssel
		R	L	H×B	L	S	W	ar max	ØD (min-max)			
QFFD	2020LL7-48H	○	○	20×20	150	21	3	7	48-66	ZTFD0303-MG	GB70-85-M6×20	WH50L
	2020LL10-48H	○	○	20×20	150	21	3	10	48-66			
	2525LL10-48H	○	○	25×25	150	26	3	10	48-66			
	2525LL17-48H	○	○	25×25	150	26	3	17	48-66			
	2020LL7-60H	○	○	20×20	150	21	3	7	60-80			
	2020LL10-60H	○	○	20×20	150	21	3	10	60-80			
	2525LL10-60H	○	○	25×25	150	26	3	10	60-80			
	2525LL17-60H	○	○	25×25	150	26	3	17	60-80			
	2020LL7-74H	○	○	20×20	150	21	3	7	74-110			
	2020LL10-74H	○	○	20×20	150	21	3	10	74-110			
	2525LL10-74H	○	○	25×25	150	26	3	10	74-110			
	2525LL17-74H	○	○	25×25	150	26	3	17	74-110			
	2020LL7-100H	○	○	20×20	150	21	3	7	100-150			
	2020LL10-100H	○	○	20×20	150	21	3	10	100-150			
	2525LL10-100H	○	○	25×25	150	26	3	10	100-150			
	2525LL17-100H	○	○	25×25	150	26	3	17	100-150			
QFGD	2020LL10-52H	○	○	20×20	150	21	4	10	52-72	ZTGD0404-MG		
	2020LL15-52H	○	○	20×20	150	26	4	15	52-72			
	2525LL13-52H	○	○	25×25	150	21	4	13	52-72			
	2525LL22-52H	○	○	25×25	150	26	4	22	52-72			
	2020LL10-64H	○	○	20×20	150	21	4	10	64-100			
	2020LL15-64H	○	○	20×20	150	26	4	15	64-100			
	2525LL13-64H	○	○	25×25	150	21	4	13	64-100			
	2525LL22-64H	○	○	25×25	150	26	4	22	64-100			
	2020LL10-90H	○	○	20×20	150	21	4	10	90-140			
	2020LL15-90H	○	○	20×20	150	26	4	15	90-140			
	2525LL13-90H	○	○	25×25	150	21	4	13	90-140			
	2525LL22-90H	○	○	25×25	150	26	4	22	90-140			
	2020LL10-130H	○	○	20×20	150	21	4	10	130-230			
	2020LL15-130H	○	○	20×20	150	26	4	15	130-230			
	2525LL13-130H	○	○	25×25	150	21	4	13	130-230			
	2525LL22-130H	○	○	25×25	150	26	4	22	130-230			

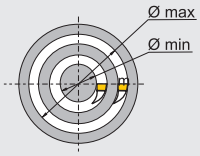
● ex stock · ab Lager ○ on demand · auf Anfrage

Axial grooving and turning tools · Axialstech- & Drehwerkzeug

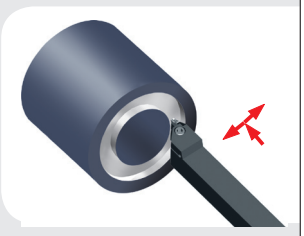


R type
Rechtsausführung





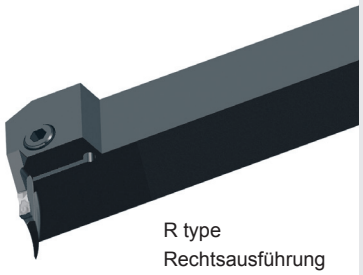
ØD= Range of entering
ØD= Bereich



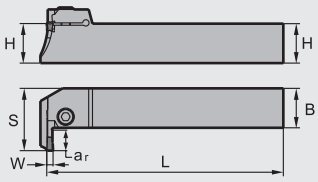
Type · Typ		Stock		Dimension (mm) Abmessung						Inserts Stechplatten	Screw Schraube	Wrench Schlüssel
		R	L	H×B	L	S	W	ar max	ØD (min-max)			
QFHD	2525LL13-58H	○	○	25×25	150	26	5	13	58-96	ZTHD0504-MG	GB70-85-M6×20	WH50L
	2525LL22-58H	○	○	25×25	150	26	5	22	58-96			
	2525LL13-86H	○	○	25×25	150	26	5	13	86-140			
	2525LL22-86H	○	○	25×25	150	26	5	22	86-140			
	2525LL13-130H	○	○	25×25	150	26	5	13	130-200			
	2525LL22-130H	○	○	25×25	150	26	5	22	130-200			
	2525LL13-185H	○	○	25×25	150	26	5	13	185-400			
	2525LL22-185H	○	○	25×25	150	26	5	22	185-400			
QFHS	2525LL30-185H	○	○	25×25	150	26	5	30	185-400	ZTHS0504-MG		
QFKD	2525LL13-60H	○	○	25×25	150	26	6	13	60-100	ZTKD0608-MG	GB70-85-M6×20	WH50L
	2525LL22-60H	○	○	25×25	150	26	6	22	60-100			
	2525LL13-88H	○	○	25×25	150	26	6	13	88-180			
	2525LL22-88H	○	○	25×25	150	26	6	22	88-180			
	2525LL13-160H	○	○	25×25	150	26	6	13	160-400			
	2525LL22-160H	○	○	25×25	150	26	6	22	160-400			
QFKS	2525LL30-160H	○	○	25×25	150	26	6	30	160-400	ZTKS0608-MG		

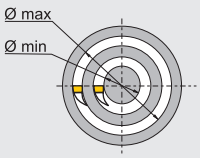
● ex stock · ab Lager ○ on demand · auf Anfrage

L type tools for Axial grooving and turning · L Typ Axialstech- & Drehwerkzeug



R type
Rechtsausführung





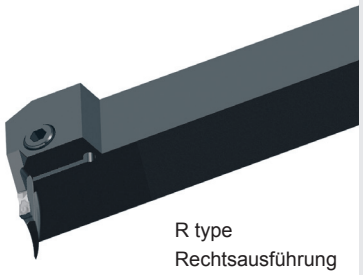
ØD= Range of entering
ØD= Bereich



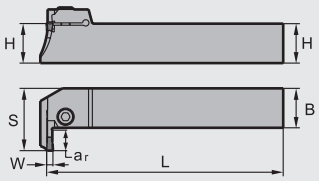
Type · Typ		Stock		Dimension (mm) Abmessung						Inserts Wendeschneidplatten	Screw Schraube	Wrench Schlüssel
		R	L	H×B	L	S	W	ar max	ØD (min-max)			
QFFD	2020R/L7-48L	○	○	20×20	150	28.5	3	7	48-66	ZTFD0303-MG	GB70-85-M6×20	WH50L
	2020R/L10-48L	○	○	20×20	150	31.5	3	10	48-66			
	2525R/L10-48L	○	○	25×25	150	36.5	3	10	48-66			
	2525R/L17-48L	○	○	25×25	150	43.5	3	17	48-66			
	2020R/L7-60L	○	○	20×20	150	28.5	3	7	60-80			
	2020R/L10-60L	○	○	20×20	150	31.5	3	10	60-80			
	2525R/L10-60L	○	○	25×25	150	36.5	3	10	60-80			
	2525R/L17-60L	○	○	25×25	150	43.5	3	17	60-80			
	2020R/L7-74L	○	○	20×20	150	28.5	3	7	74-110			
	2020R/L10-74L	○	○	20×20	150	31.5	3	10	74-110			
	2525R/L10-74L	○	○	25×25	150	36.5	3	10	74-110			
	2525R/L17-74L	○	○	25×25	150	43.5	3	17	74-110			
	2020R/L7-100L	○	○	20×20	150	28.5	3	7	100-150			
	2020R/L10-100L	○	○	20×20	150	31.5	3	10	100-150			
	2525R/L10-100L	○	○	25×25	150	36.5	3	10	100-150			
	2525R/L17-100L	○	○	25×25	150	43.5	3	17	100-150			
QFGD	2020R/L10-52L	○	○	20×20	150	31.5	4	10	52-72	ZTGD0404-MG		
	2525R/L13-52L	○	○	25×25	150	39.5	4	13	52-72			
	2020R/L15-52L	○	○	20×20	150	36.5	4	15	52-72			
	2525R/L22-52L	○	○	25×25	150	48.5	4	22	52-72			
	2020R/L10-64L	○	○	20×20	150	31.5	4	10	64-100			
	2525R/L13-64L	○	○	25×25	150	39.5	4	13	64-100			
	2020R/L15-64L	○	○	20×20	150	36.5	4	15	64-100			
	2525R/L22-64L	○	○	25×25	150	48.5	4	22	64-100			
	2020R/L10-90L	○	○	20×20	150	31.5	4	10	90-140			
	2525R/L13-90L	○	○	25×25	150	39.5	4	13	90-140			
	2020R/L15-90L	○	○	20×20	150	36.5	4	15	90-140			
	2525R/L22-90L	○	○	25×25	150	48.5	4	22	90-140			
	2020R/L10-130L	○	○	20×20	150	31.5	4	10	130-230			
	2525R/L13-130L	○	○	25×25	150	39.5	4	13	130-230			
	2020R/L15-130L	○	○	20×20	150	36.5	4	15	130-230			
	2525R/L22-130L	○	○	25×25	150	48.5	4	22	130-230			

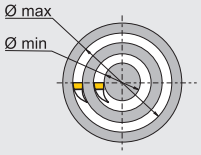
● ex stock · ab Lager ○ on demand · auf Anfrage

L type tools for Axial grooving and turning · L Typ Axialstech- & Drehwerkzeug



R type
Rechtsausführung





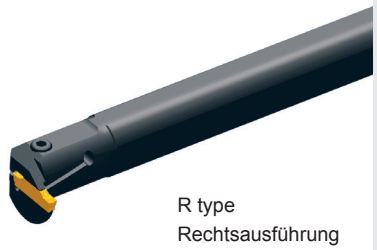
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ØD= Bereich



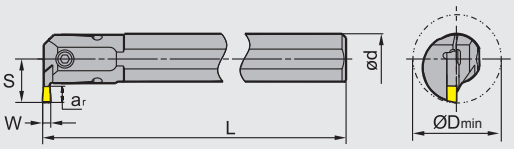
Type · Typ		Stock		Dimension (mm) Abmessung						Inserts Stechplatten	Screw Schraube	Wrench Schlüssel
		R	L	H×B	L	S	W	ar max	ØD (min-max)			
QFHD	2525R/L13-58L	○	○	25×25	150	39.5	5	13	58-96	ZTHD0504-MG	GB70-85-M6×20	WH50L
	2525R/L22-58L	○	○	25×25	150	48.5	5	22	58-96			
	2525R/L13-86L	○	○	25×25	150	39.5	5	13	86-140			
	2525R/L22-86L	○	○	25×25	150	48.5	5	22	86-140			
	2525R/L13-130L	○	○	25×25	150	39.5	5	13	130-200			
	2525R/L22-130L	○	○	25×25	150	48.5	5	22	130-200			
	2525R/L13-185L	○	○	25×25	150	39.5	5	13	185-400			
	2525R/L22-185L	○	○	25×25	150	48.5	5	22	185-400			
QFHS	2525R/L30-185L	○	○	25×25	150	56.5	5	30	185-400	ZTHS0504-MG		
QFKD	2525R/L13-60L	○	○	25×25	150	39.5	6	13	60-100	ZTKD0608-MG	GB70-85-M6×20	WH50L
	2525R/L22-60L	○	○	25×25	150	48.5	6	22	60-100			
	2525R/L13-88L	○	○	25×25	150	39.5	6	13	88-180			
	2525R/L22-88L	○	○	25×25	150	48.5	6	22	88-180			

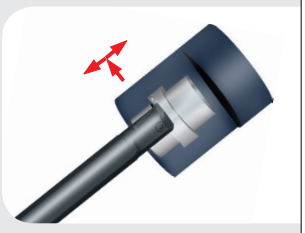
● ex stock · ab Lager ○ on demand · auf Anfrage

Internal grooving and turning tools · Einstech- & Drehwerkzeuge (Innen)



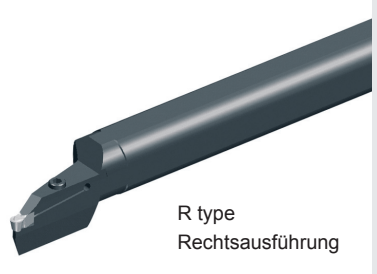
R type
Rechtsausführung



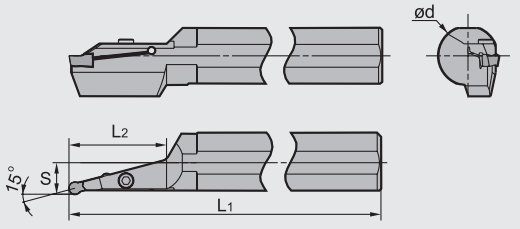


Type · Typ	Stock		Dimension (mm) Abmessung						Inserts Stechplatte	Screw Schraube	Wrench Schlüssel
	R	L	ød	L	S	W	ar max	ØDmin			
C20Q-QEDR/L05-27	●	○	20	180	15.2	2.5	5	27	ZTED02* ZRED025*	GB70-85-M4×12	WH30L
C25R-QEDR/L07-33	●	●	25	200	20.3	2.5	7	33		GB70-85-M5×16	WH40L
C32S-QEDR/L09-42	●	●	32	250	25.3	2.5	9	42		GB70-85-M5×20	
C20Q-QFDR/L05-27	●	●	20	0	15.2	3	5	27	ZTFD03* ZRFD03*	GB70-85-M4×12	WH30L
C25R-QFDR/L07-33	●	●	25	200	20.3	3	7	33		GB70-85-M5×16	WH40L
C32S-QFDR/L09-42	●	●	32	250	25.3	3	9	42		GB70-85-M5×20	
C25R-GDR/L08-35	●	●	25	200	21.5	4	8	35	ZTGD04* ZRFD04*	GB70-85-M5×16	WH40L
C32S-QGDR/L11-44	●	●	32	250	27.5	4	11	44		GB70-85-M6×20	WH50L
C40T-QGDR/L13-54	●	●	40	300	33.5	4	13	5		GB70-85-M6×20	
C25R-QHDR/L08-35	○	○	25	200	21.5	5	8	35	ZTHD05* ZRHD05*	GB70-85-M5×16	WH40L
C32S-QHDR/L11-44	●	●	32	250	27.5	5	11	44		GB70-85-M6×20	WH50L
C40T-QHDR/L13-54	●	○	40	300	33.5	5	13	54		GB70-85-M6×20	
C25R-QKDR/L08-35	○	○	25	200	21.5	6	8	35	ZTKD06* ZRKD06*	GB70-85-M5×16	WH40L
C32S-QKDR/L11-44	●	●	32	250	27.5	6	11	44		GB70-85-M6×20	WH50L
C40T-QKDR/L13-54	●	●	40	300	33.5	6	13	54		GB70-85-M6×20	

Profiling and turning tools for Al · Profildreh- & Einstechwerkzeuge für Alu (Innen)



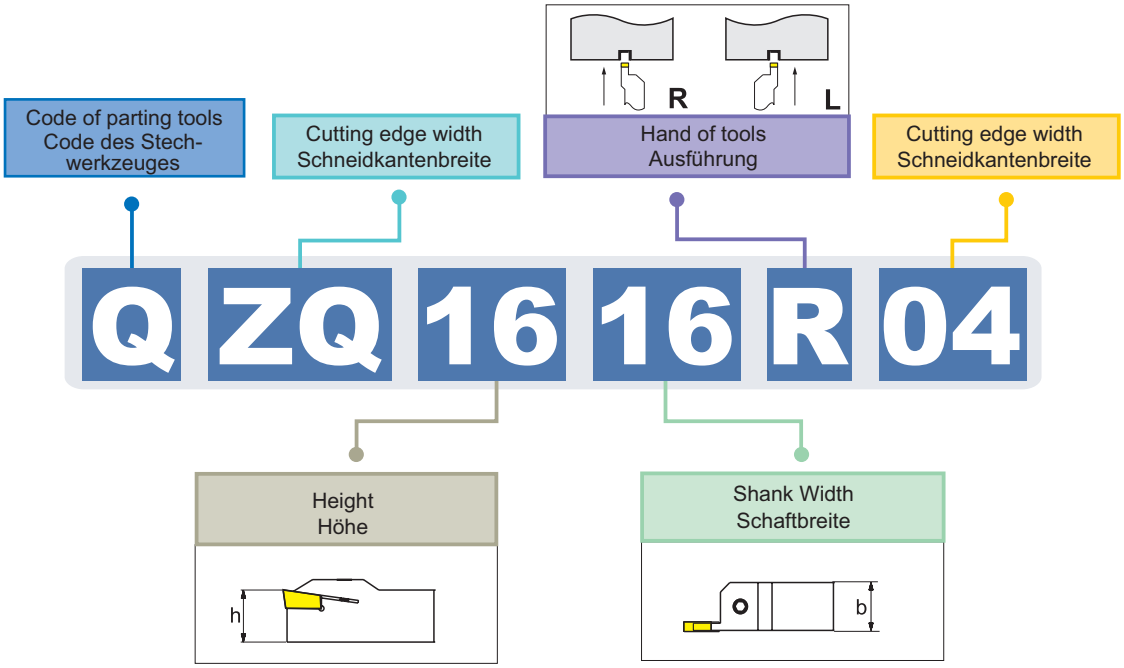
R type
Rechtsausführung

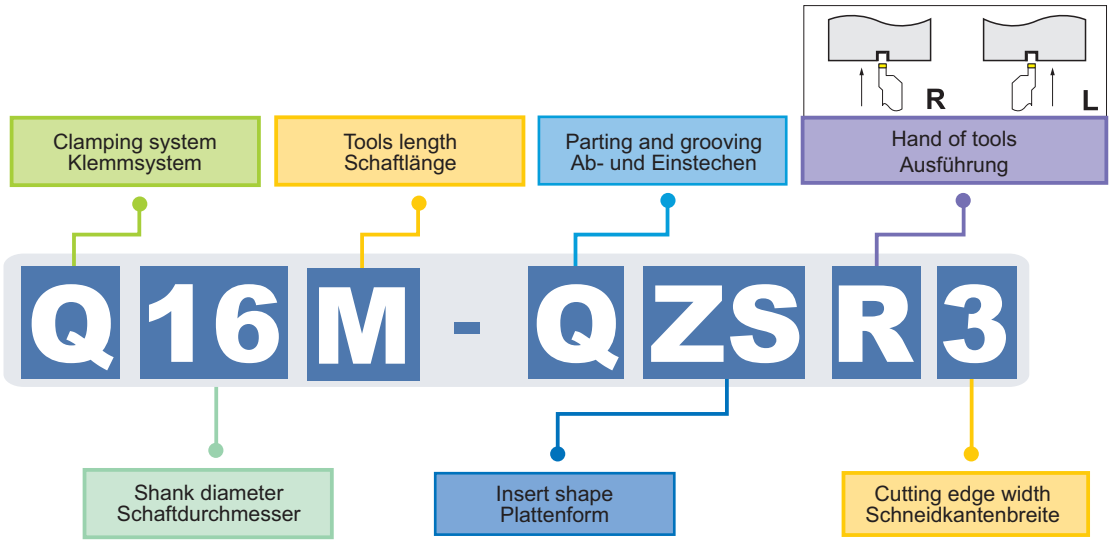




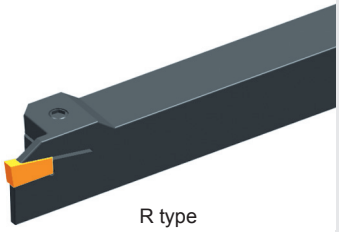
Type · Typ	Stock		Dimension (mm) Abmessung					Inserts Stechplatten	Screw Schraube	Wrench Schlüssel
	R	L	ØD ()	ød	S	L1	L2			
C40X-QLDR/L65-15A	●	●	160	40	21	320	65	ZRLD08-LH	GB70-85-M6×20	WH50L
C40X-QLDR/L80-15A	●	○	160	40	21	320	80	ZRLD08-LH		
C40X-QKDR/L60-15A	○	○	160	40	20	320	60	ZRKD06-LH		
C40X-QKDR/L75-15A	○	○	160	40	20	320	75	ZRKD06-LH		

● ex stock · ab Lager ○ on demand · auf Anfrage

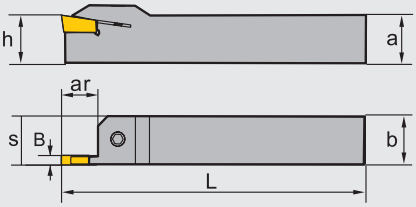

Code of parting tools
Code des Stech-
werkzeuges
Cutting edge width
Schneidkantenbreite
R
L
Hand of tools
Ausführung
Cutting edge width
Schneidkantenbreite
Q ZQ 16 16 R 04
Height
Höhe
h
Shank Width
Schaftbreite
b

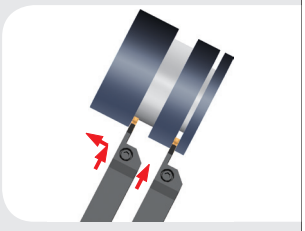

R
L
Clamping system
Klemmsystem
Tools length
Schaftlänge
Parting and grooving
Ab- und Einstechen
Hand of tools
Ausführung
Q 16 M - Q ZS R 3
Shank diameter
Schaftdurchmesser
Insert shape
Plattenform
Cutting edge width
Schneidkantenbreite

External parting and grooving · Ab- & Einstechwerkzeug (Außen): QZQ Series



R type
Rechtsausführung

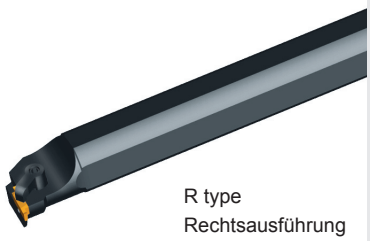




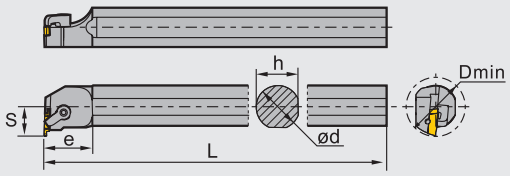
Type · Typ		Stock		Dimension (mm) Abmessung						Inserts Stechplatten	Screw Schraube	Wrench Schlüssel
		R	L	a=h	b	L	S	B	ar max			
QZQ	1616R/L03	●	●	16	16	100	16.4	3	16	ZQMX3N11-IE	GB70-85-M5×16	WH40L
	1616R/L04	○	○	16	16	100	16.4	4	18	ZQMX4N11-IE		
	2020R/L03	●	●	20	20	125	20.4	3	20	ZQMX3N11-IE	GB70-85-M6×20	WH50L
	2020R/L04	●	●	20	20	125	20.4	4	20	ZQMX4N11-IE		
	2525R/L03	●	●	25	25	150	25.4	3	20	ZQMX3N11-IE		
	2525R/L04	●	●	25	25	150	25.4	4	20	ZQMX4N11-IE		
	2525R/L05	●	●	25	25	150	25.4	5	25	ZQMX5N11-IE		
	2525R/L06	●	●	25	25	150	25.7	6	32	ZQMX6N11-IE		
	3225R/L03	●	○	32	25	170	25.4	3	25	ZQMX3N11-IE		
	3225R/L04	●	○	32	25	170	25.4	4	25	ZQMX4N11-IE		
	3225R/L05	●	○	32	25	170	25.4	5	25	ZQMX5N11-IE		
	3225R/L06	●	●	32	25	170	25.7	6	35	ZQMX6N11-IE		

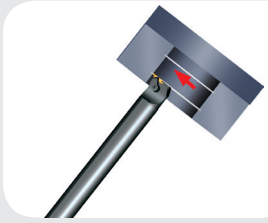
● ex stock · ab Lager ○ on demand · auf Anfrage

Internal parting and grooving · Ab- & Einstechwerkzeug (Innen): QZS Series



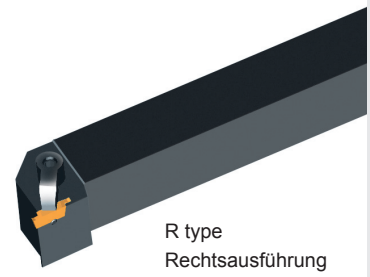
R type
Rechtsausführung



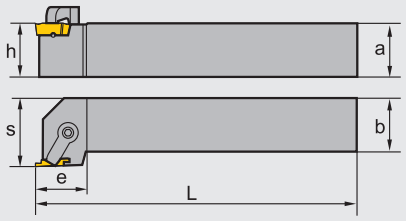


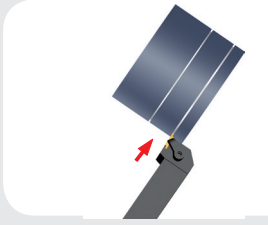
Type · Typ	Stock		Dimension (mm) Abmessung						Inserts Stechplatten	Screw Schraube	Wrench Schlüssel	Clamp Klemme
	R	L	L	h	S	e	ØD	ød				
C16M-QZSR3	○		150	15	11	17	20	16	ZS**3**L	DM5x14	WH25L	C4RD
C20M-QZSR3	○		150	18	13.5	22	26	20				
C25R-QZSR3	○		200	23	17	22	32	25				
C40T-QZSR3	○		300	37	27	32	50	40				
C25R-QZSR5	○		200	23	17	2	20	25	ZSM*5**L			
C40T-QZSR5	○		300	37	27	32	50	40				
C16M-QZSL3		○	10	15	11	17	32	16	ZSM*3*R			
C20M-QZSL3		○	150	18	13.5	22	26	20				
C25R-QZSL3		○	200	23	17	22	32	25				
C40T-QZSL3		○	300	37	27	32	50	40				
C25R-QZSL5		○	200	23	17	22	32	25	ZSM*5*R			
C40T-QZSL5		○	300	37	27	32	50	40				

External parting and grooving · Ab- & Einstechwerkzeug (Außen) : QZS Series



R type
Rechtsausführung

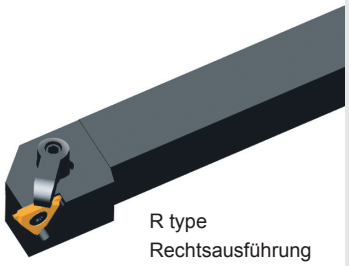




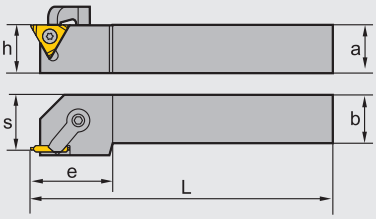
Type · Typ	Stock		Dimension (mm) Abmessung						Inserts Stechplatten	Screw Schraube	Wrench Schlüssel	Clamp Klemme
	R	L	a	b	L	h	s	e				
QZS2525R3	○		25	25	150	25	32	23.5	ZS**3***R	DM6x25	WH30L	C2RD
QZS2525R5	○		25	25	150	25	32	23.5	ZSM*5***R			
QZS2525L3		○	25	25	150	25	32	23.5	ZSM*3***L			
QZS2525L5		○	25	25	150	25	32	23.5	ZSM*5***L			

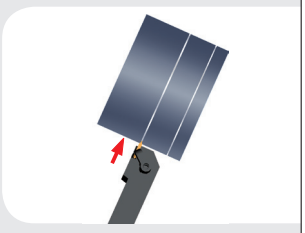
● ex stock · ab Lager ○ on demand · auf Anfrage

External parting and grooving · Ab- & Einstechwerkzeug (Außen) : QT Series



R type
Rechtsausführung

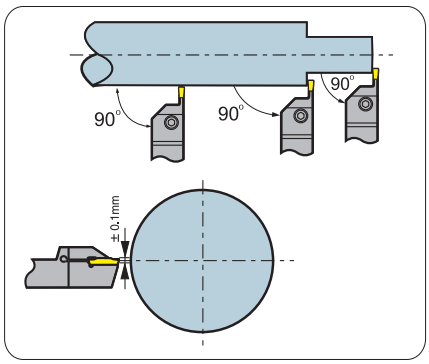




Type · Typ	Stock		Dimension (mm) Abmessung					Inserts Stechplatten	Screw Schraube	Screw Schraube	Wrench Schlüssel	Clamp Klemme
	R	L	a	b	L	h	s					
QT2020R3	●		20	20	125	20	22	154.3-161	I90M3.5x8	DM6x25	WT09IP WH30L	C2RD
QT2020R4	●		20	20	125	20	21	154.3-162				
QT2525R3	●		25	25	150	25	27	154.3-163				
QT2525R4	●		25	25	150	25	26	154.3-164				

● ex stock · ab Lager ○ on demand · auf Anfrage

Center height controlling of parting and grooving tools
Einstellung der Schneidenhöhe beim Ab- & Einstechen



● No matter what kind of parting and grooving cutting tools you choose, you should keep 90° between the insert and the center line of the work-piece material to get perfect machined surface, and to reduce liberation during machining.

● Bitte montieren Sie den Werkzeughalter so, dass er im 90° Winkel zur Mittelachse des Werkstücks steht. Dadurch erhalten Sie eine bessere Oberflächengüte und verringern das Risiko von Schwingungen.

● Height tolerance between the cutting edge of an insert and the center of work piece should be kept ± 0.1mm, especially for the parting of rods and grooving of materials with a small diameter. You achieve a longer tool lifetime and reduce cutting resistance and burrs.

● Bitte montieren Sie Ihren Werkzeughalter so, dass er beim Abstechen oder Einstechen speziell bei Werkstücken mit kleineren Durchmessern im Toleranzbereich von ± 0,1 mm zur Mittelachse steht. Sie erreichen dadurch eine längere Standzeit, reduzieren die Schnittkräfte und Butzenbildung.

Parting · Abstechen

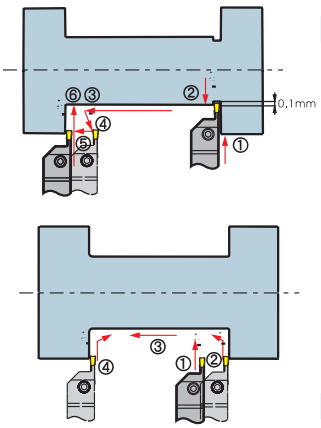
● A reduction of the feedrate by 30% is preferred when the inserts approach the centre of workpiece, prolonging the life-time of the inserts.

● Eine Reduzierung des Vorschubs um 30% bei der Annäherung der Schneide an die Mittelachse des Werkstücks verlängert die Standzeit der Stechplatte.

● A tool holder overhang with as little as possible to insure good stability.

● Werkzeughalter mit kleinstmöglichem Überhang wählen, um Vibrationen und Werkzeugablenkung zu vermeiden.

External grooving, turning and profile turning · Längsdrehen,Profildrehen



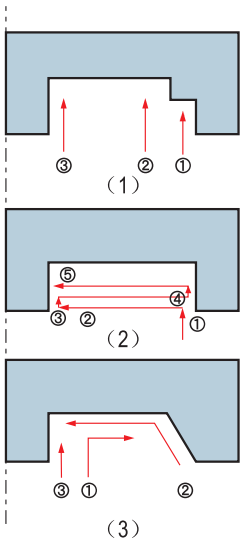
● Cutting sequences: As the cutting depth is bigger than 0.5mm, radial cutting (biggest cutting depth 0.75 x edge width of insert) radial backing 0.1mm axial feed oblique back axial cutting radial cutting to the depth require.

● Bearbeitungsfolge 0,5mm: Radialer Vorschub auf erforderliche Schnitttiefe(ap max. 0.75 x Schneidplattenbreite) radiales Zurücksetzen um 0.1 mm Längsdrehen zur gegenüberliegenden Schulter diagonales Zurücksetzen um 0.5mm nach außen axial Vorschub bis zum Startpunkt radialer Vorschub auf erforderliche Schnitttiefe usw.

● When cutting bottom border or chamfering, do what the sketch show, reducing liberation by the friction of cutting tools with chippings.

● Beim Drehen des Nutgrundes oder der Fase befolgen Sie die nebenstehenden Arbeitsschritte. Dies reduziert die Auslenkung des Werkzeuges und verhindert Schneidkantenausbrüche.

Surface grooving and turning · Axialeinstechen



Roughing · Schruppen

● Infeed from largest Ø inwards insert offset slightly from inner side of groove when retracting as shown in sketch (1).

● Bearbeitung vom größten Ø zur Achse hin. Beim Zurückfahren des Werkzeugs empfiehlt es sich, diese leicht abzuwinkeln.

Flute turning · Nutendrehen

● Depth of axial turning less than 0.75 x S (Width of insert)
width > depth of breaker, suggest to do as shown in sketch (2)
depth > width of breaker, suggest to cut with a lot breaker.

● Spantiefe bei axialem Vorschub kleiner als 0.75 x S (Breite des Schneideinsatzes) Wenn die Kammerbreite größer ist als die Tiefe, folgen Sie den abgebildeten Arbeitsschritten. Wenn die Kammertiefe größer ist als die Breite, empfehlen wir in einzelnen Schritten auf den geforderten Ø zu stechen (2).

Finishing · Schlichten

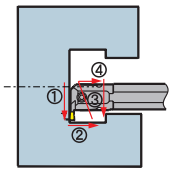
● Finish machining external Ø and bottom firstly, then machining the internal Ø to the size reqired as shown in sketch (3).

● Zum Schlichten bearbeiten Sie zuerst den äußeren Ø und den Grund. Anschließend bearbeiten Sie den inneren Ø bis zur erforderlichen Größe Skizze (3).

Internal grooving · Innenbearbeitung

● Follow the machining sequence as shown in the picture.
Good for chip flow, always feed along the direction of moving from the deepest in the hole to outside.

● Bearbeitungsfolge gemäß Skizze. Bei der Bearbeitung von Sackbohrungen, sollte zur besseren Spanabfuhr von innen nach außen gearbeitet werden.



Recommended cutting parameters · Empfohlene Schnittparameter

Inserts Size Stechplatte Größe	Recommended feed rate (mm/rev) · Empfohlener Vorschub (mm/U)			
Inserts width(mm) Stechplatte Breite	Parting Abstechen	Grooving Einstechen	Turning Drehen	Profiling Profildrehen
2.5	0.05—0.15	0.05—0.15	0.05—0.15	0.05—0.15
3	0.05—0.15	0.05—0.15	0.07—0.15	0.1—0.2
4	0.05—0.2	0.05—0.2	0.07—0.25	0.1—0.2
5	0.07—0.2	0.07—0.22	0.1—0.25	0.15—0.3
6	0.1—0.3	0.07—0.25	0.1—0.3	0.15—0.3

Workpiece Material Werkstück Material		Hardness Härte	YBG302	YBG202	YBC151	YBC251	YD101	YD201	YBG102	YC10	YC40
P	Carbon steel Kohlenstoffstahl	125≤HB≤170	120-260	150-280	140-280	150-280				130-280	110-260
	Low alloy steel niedrig legierter Stahl	180≤HB≤275	80-175	110-200	100-240	110-200				90-200	70-175
	High alloy steel Hoch legierter Stahl	180≤HB≤325	80-160	110-190	100-220	110-190				90-190	70-160
	Cast steel Stahlguss	180≤HB≤250	75-140	100-170	80-160	100-170				80-170	60-140
M	Ferrite Martensite	200≤HB≤300	70-170	100-200		100-200				80-200	60-170
	Austenite	180≤HB≤300	80-200	110-220		110-220				90-220	70-200
K	Malleable cast iron Temperguss	130≤HB≤230	100-200	130-220				90-160			
	Grey cast iron Grauguss	180≤HB≤220	90-170	120-200				80-140			
	Nodular cast iron	160≤HB≤250	80-150	110-180				60-140			
N	Al alloy Alu-Legierung	--					200-400				
S	Heat resistant alloy hitzebeständigen Legierungen	≤400					20-50		30-60		

The cutting parameters recommended are suitable for wet machining.
Die angegebenen Schnittparameter werden für die Berabeitung mit Kühlflüssigkeit empfohlen.
Advice: internal machining and Axial machining, The cutting speed should be reduced by 30%-40%.
Hinweis: Bei Innen- und Axialstechen, sollte die Schnittgeschwindigkeit um 30%-40% reduziert werden.

Turning · Drehen

Threading Tools · Gewindedreh Werkzeuge

Threading tools Overview · **Klemmhalter zum Gewindedrehen Übersicht** **A292-A293**

Introduction of threading inserts grade and chipbreaker
Sortenbeschreibung und Spanbrecher der Gewinde WSP **A294**

Threading inserts· Gewindedrehplatten **A295-A302**

Threading inserts code key · Gewindedrehplatten ISO Kennzeichen A295

ISO metric external thread ISO metrische Außengewinde A296

ISO metric internal thread ISO metrische Innengewinde A297

General pitch thread "General pitch" Gewinde A298

Whitworth thread "Whitworth" Gewinde A299

Unified thread "Unified" Gewinde A300

British standard taper piper thread "British standard" Gewinde A301

American standard taper piper thread "American standard" Gewinde A302

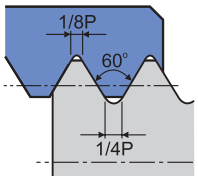
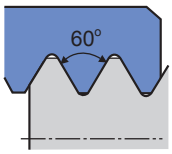
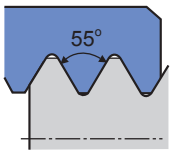
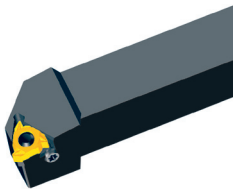
Threading tools · Gewindedrehwerkzeuge **A303-A305**

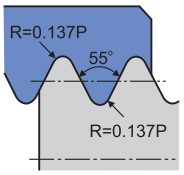
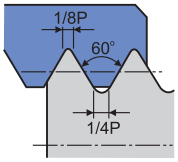
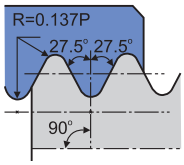
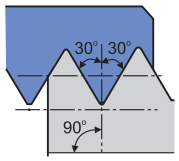
Threading tools code key · Gewindedrehwerkzeuge ISO Kennzeichen A303

External threading tools · Gewindedrehwerkzeuge (Außen) A304

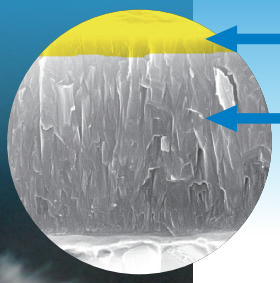
Internal threading tools · Gewindedrehwerkzeuge (Innen) A305

Application information of threading
Anwendungsinformationen für das Gewindedrehen **A306-316**

Applications Anwendungen		For general Allgemein		
Cutline				
Thread name · Gewindebezeichnung		ISO metric thread Full profile Vollprofil	General pitch thread Partial profile Teilprofil	General pitch thread Partial profile Teilprofil
Profil		**GM**	**60°**	**55°**
Shape of insert WSP Abmessung (length/ Länge: 11, 16, 22mm)		Illustration: external thread right hand. Illustration: Außengewinde in Rechtsausführung.  A296-A297	Illustration: external thread right hand. Illustration: Außengewinde in Rechtsausführung.  A298	Illustration: external thread right hand. Illustration: Außengewinde in Rechtsausführung.  A298
Toolholder / Werkzeughalter — Pitch / Steigung	Dimensions (mm) (H×W×L) (Dia.× Length × Min.Diameter)	Pitch/mm Steigung/mm (pitch/Inch)	Pitch/mm Steigung/mm (pitch/Inch)	Pitch/mm Steigung/mm (pitch/Inch)
External thread · Außengewinde	 A290	16×16×100 20×20×125 25×25×150 32×25×170 32×32×170 40×40×250	1.0~6.0	0.5~5.0 (5~48)	0.5~5.0 (5~48)
Internal thread · Innengewinde	 A291	16×125×12 16×150×16 16×150×20 20×150×25 20×180×25 25×150×32 32×200×40 32×250×40 40×300×50 50×350×63	1.0~6.0	0.5~5.0 (5~48)	0.5~5.0 (5~48)

Applications Anwendung	For general Allgemein	For aerospace and aviation industries Luft- & Raumfahrt	Pipe thread for heater, gas and water Rohrgewinde für: Dampf, Gas & Heizung	For connecting between pipe fitting and coupling of gas and water Für Gas & Wasser Fittinge und Kupplungen
Cutline				
Thread name Gewindebez.	Whitworth thread /Gewinde	Unified thread (American standard threads)	British standard taper piper threads	American standard taper pipe threads
Profil	**W**	**UN**	**BSPT**	**NPT**
Shape of insert WSP Abmessung (length/Länge: 11, 16, 22mm)	Illustration: external thread right hand. Illustration: Außengewinde in Rechtsausführung.  A299	Illustration: external thread right hand. Illustration: Außengewinde in Rechtsausführung.  A300	Illustration: external thread right hand. Illustration: Außengewinde in Rechtsausführung.  A301	Illustration: external thread right hand. Illustration: Außengewinde in Rechtsausführung.  A302
Dimensions (mm) (H×W×L) (Dia.× Length × Min.Diameter)	Pitch/mm Steigung/mm (pitch/Inch)	Pitch/mm Steigung/mm (pitch/Inch)	Pitch/mm Steigung/mm (pitch/Inch)	Pitch/mm Steigung/mm (pitch/Inch)
External thread · Außengewinde 16×16×100 20×20×125 25×25×150 32×25×170 32×32×170 40×40×250	8~16	8~20	11~28	8~27
Internal thread · Innengewinde 16×125×12 16×150×16 16×150×20 20×150×25 20×180×25 25×150×32 32×200×40 32×250×40 40×300×50 50×350×63	8~16	8~20	11~28	8~27





The golden TiN Coating reduces friction and provides wear identification.
Die goldene TiN Beschichtung reduziert die Reibung und ermöglicht die Verschleiß Identifikation.

Inner layer nc-TiAlN coating provides an excellent wear resistance.
Die innere Beschichtung nc-TiAlN ermöglicht eine exzellente Verschleißfestigkeit.

YBG201

PVD coating alloy has good toughness and wear resistance, it´s the **unique** threading grade for machining of carbon steel, stainless steel and cast iron etc.

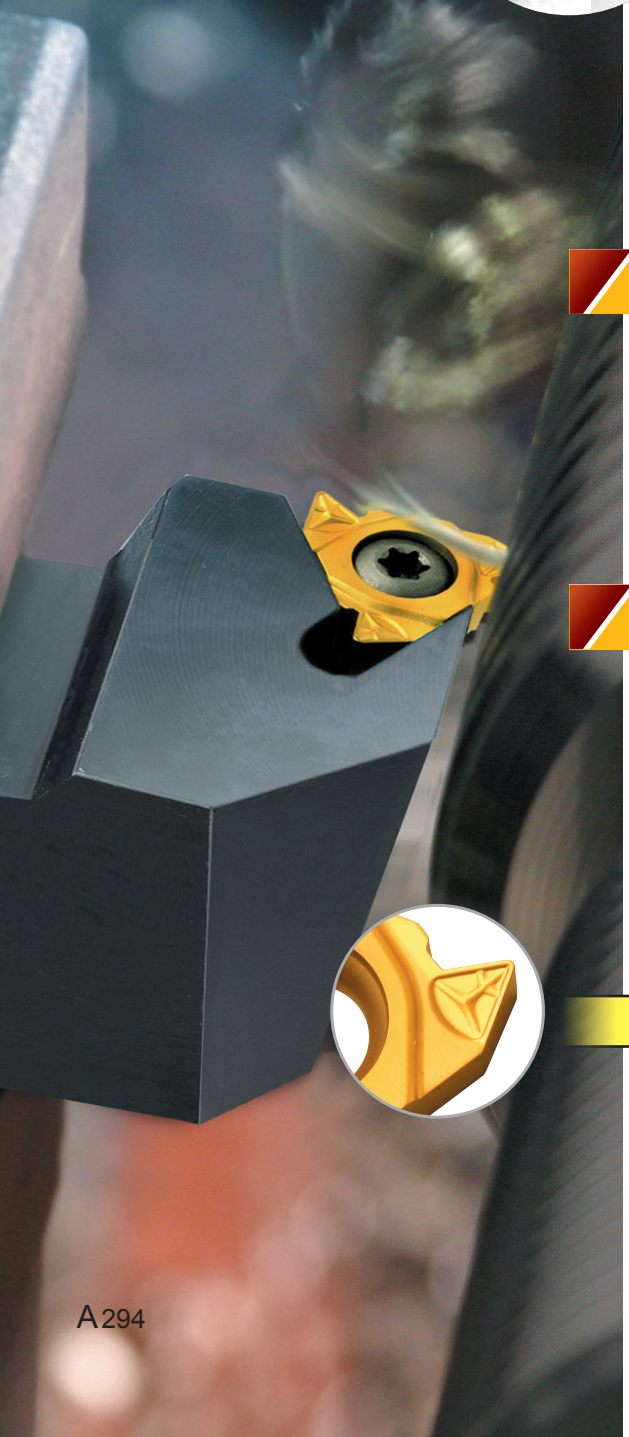
PVD Multibeschichtung mit hoher Härte und Verschleißfestigkeit. Es ist die ZCC Gewindesorte für die Bearbeitung von Kohlenstoff-, rostfreien Stahl und Grauguss. etc.

The functions and applications of Wiper for threading inserts
Die Funktionen und Anwendungen der Wiper Schneidplatten

Reduction of machining processes.
The threading diameter will be machined during threading operation. Good qualitiy and dimensions.

Reduziert die Bearbeitungsschritte.
Der Gewindedurchmesser wird während des Gewinde-schneidens in einem Arbeitsgang bearbeitet. Gute Oberfläche und Maßhaltigkeit.

Design characteristics chip breaker
Spezielle Spanbrecherform



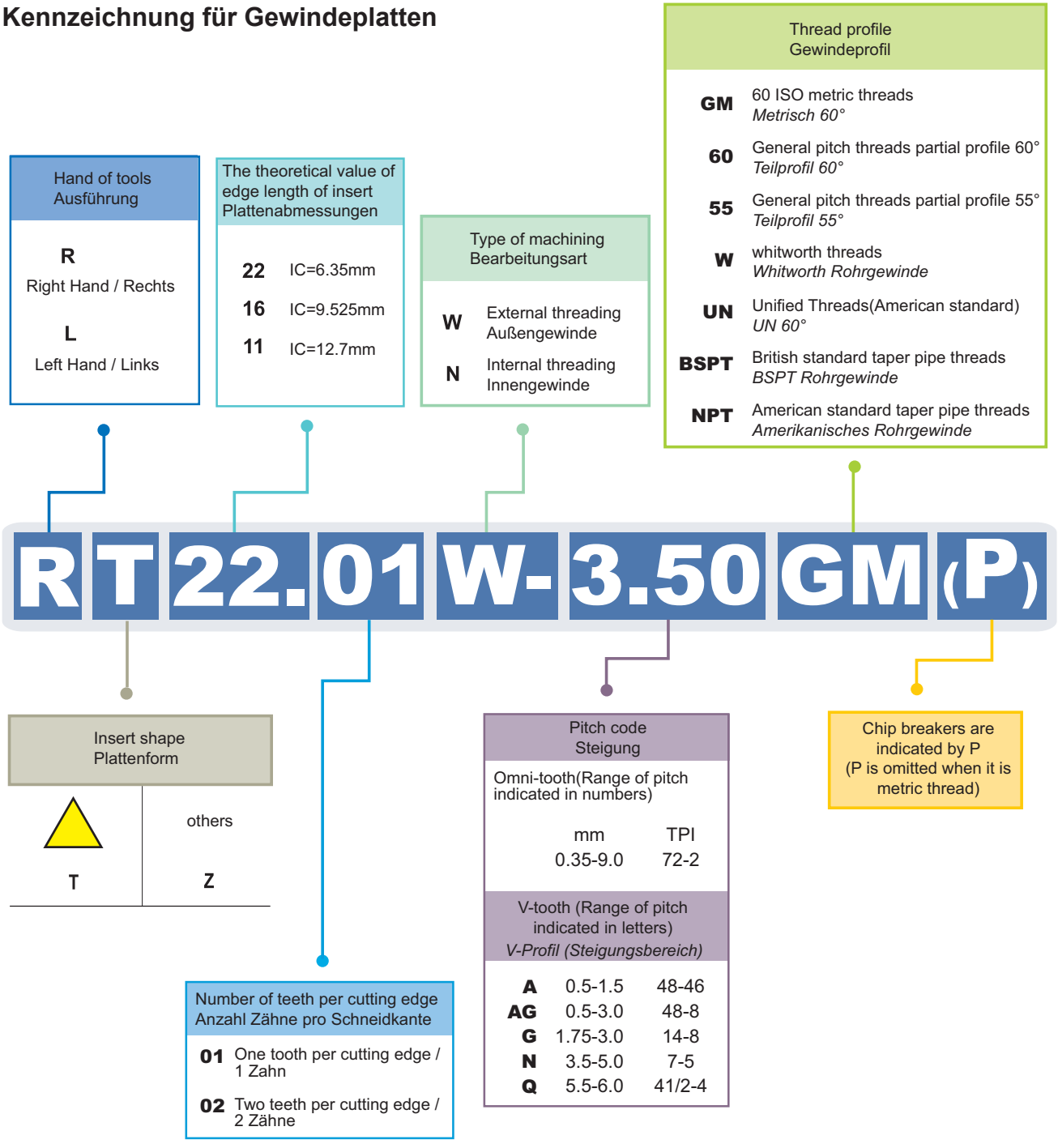
The ZCC CT Chip-breaker

The special chip breaker design ensured an excellent chip controled, during machining **different** materials.

Der ZCC CT Spanbrecher

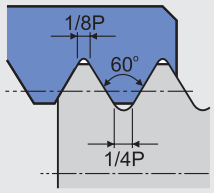
Der speziell entwickelter Spanbrecher formt und kontrolliert die Spanbildung in der Form, dass auch bei der Bearbeitung unterschiedlicher Werkstückstoffe, eine exzellente Spankontrolle entsteht.

Threading inserts code key
Kennzeichnung für Gewindeplatten



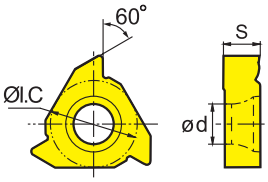
ISO metric thread insert (full profil)
Allgemeiner Einsatz (Vollprofil)

ISO 965-1980 DIN 13
GB·T 197-2003 tolerances: 6g·6H



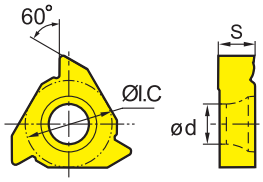


R



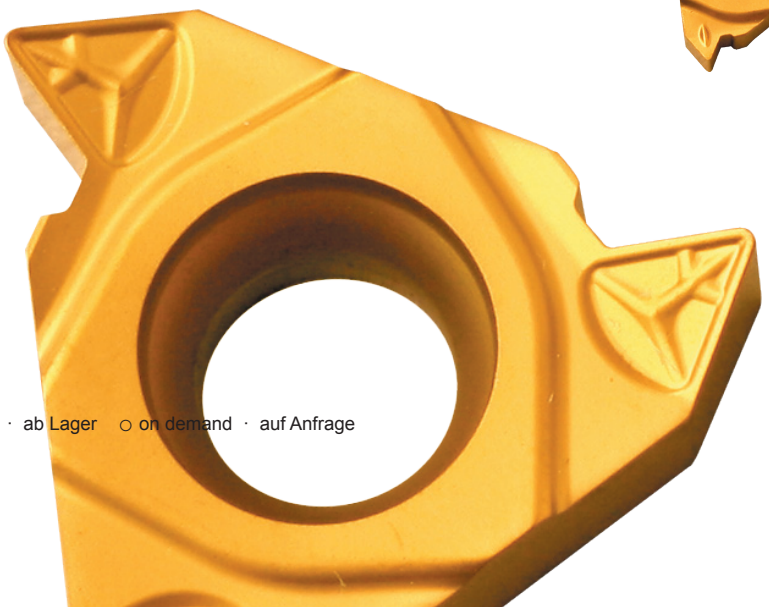


L



	Type · Typ		Dimension (mm) Abmessung				Grade · Sorte	
	Right hand Rechtsausführung	Left hand Linksausführung	Pitch · Steigung (T.P.i)	S	ØI.C	ød	YBG201	
							R	L
External · Außen	**RT16.01W-1.00GM**	**LT16.01W-1.00GM**	1.00	3.97	9.525	4.4	●	●
	RT16.01W-1.25GM	**LT16.01W-1.25GM**	1.25	3.97	9.525	4.4	●	●
	RT16.01W-1.50GM	**LT16.01W-1.50GM**	1.50	3.97	9.525	4.4	●	●
	RT16.01W-1.75GM	**LT16.01W-1.75GM**	1.75	3.97	9.525	4.4	●	●
	RT16.01W-2.00GM	**LT16.01W-2.00GM**	2.00	3.97	9.525	4.4	●	●
	RT16.01W-2.50GM	**LT16.01W-2.50GM**	2.50	3.97	9.525	4.4	●	●
	RT16.01W-3.00GM	**LT16.01W-3.00GM**	3.00	3.97	9.525	4.4	●	●
	RT22.01W-3.50GM	**LT22.01W-3.50GM**	3.50	5.56	12.7	5.5	●	●
	RT22.01W-4.00GM	**LT22.01W-4.00GM**	4.00	5.56	12.7	5.5	●	●
	RT22.01W-4.50GM	**LT22.01W-4.50GM**	4.50	5.56	12.7	5.5	●	○
	RT22.01W-5.00GM	**LT22.01W-5.00GM**	5.00	5.56	12.7	5.5	●	●
	RT22.01W-5.50GM	**LT22.01W-5.50GM**	5.50	5.56	12.7	5.5	●	○
	RT22.01W-6.00GM	**LT22.01W-6.00GM**	6.00	5.56	12.7	5.5	●	●





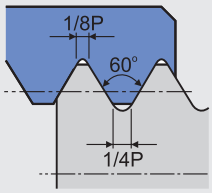


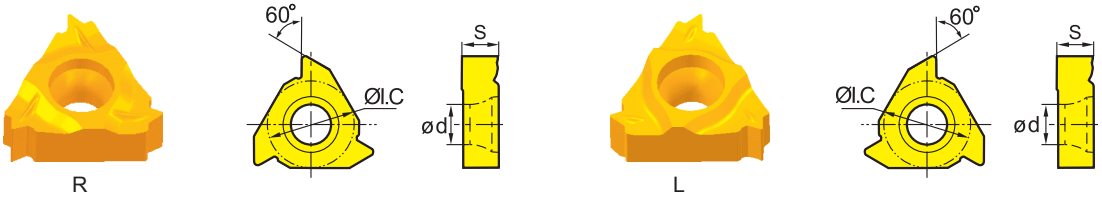


● ex stock · ab Lager ○ on demand · auf Anfrage

ISO metric thread insert (full profil)
Allgemeiner Einsatz (Vollprofil)

ISO 965-1980 DIN 13
GB·T 197-2003 tolerances: 6g·6H

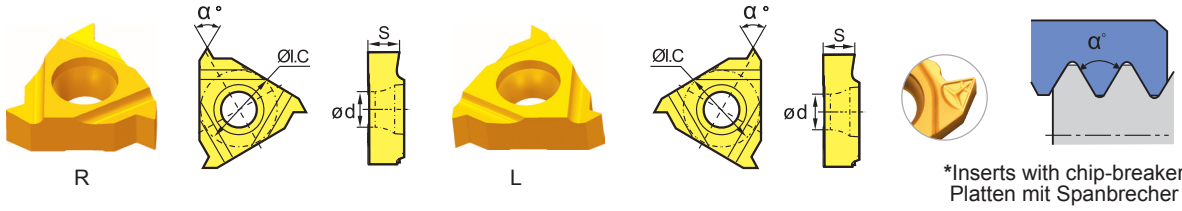




	Type · Typ		Dimension (mm) Abmessung				Grade · Sorte	
	Right hand Rechtsausführung	Left hand Linksausführung	Pitch·Steigung (T.P.i)	S	ØI.C	ød	YBG201	
							R	L
Internal·Innen	**RT11.01N-1.00GM**	**LT11.01N-1.00GM**	1.00	3.18	6.35	2.8	●	●
	RT11.01N-1.25GM	**LT11.01N-1.25GM**	1.25	3.18	6.35	2.8	●	●
	RT11.01N-1.50GM	**LT11.01N-1.50GM**	1.50	3.18	6.35	2.8	●	●
	RT11.01N-1.75GM	**LT11.01N-1.75GM**	1.75	3.18	6.35	2.8	●	○
	RT11.01N-2.00GM	**LT11.01N-2.00GM**	2.00	3.18	6.35	2.8	●	●
	RT16.01N-1.00GM	**LT16.01N-1.00GM**	1.00	3.97	9.525	4.4	●	●
	RT16.01N-1.25GM	**LT16.01N-1.25GM**	1.25	3.97	9.525	4.4	●	●
	RT16.01N-1.50GM	**LT16.01N-1.50GM**	1.50	3.97	9.525	4.4	●	●
	RT16.01N-1.75GM	**LT16.01N-1.75GM**	1.75	3.97	9.525	4.4	●	●
	RT16.01N-2.00GM	**LT16.01N-2.00GM**	2.00	3.97	9.525	4.4	●	●
	RT16.01N-2.50GM	**LT16.01N-2.50GM**	2.5	3.97	9.525	4.4	●	●
	RT16.01N-3.00GM	**LT16.01N-3.00GM**	3.00	3.97	9.525	4.4	●	●
	RT22.01N-3.50GM	**LT22.01N-3.50GM**	3.50	5.56	12.7	5.5	●	●
	RT22.01N-4.00GM	**LT22.01N-4.00GM**	4.00	5.56	12.7	5.5	●	●
	RT22.01N-4.50GM	**LT22.01N-4.50GM**	4.50	5.56	12.7	5.5	●	●
	RT22.01N-5.00GM	**LT22.01N-5.00GM**	5.00	5.56	12.7	5.5	●	●
	RT22.01N-5.50GM	**LT22.01N-5.50GM**	5.50	5.56	12.7	5.5	●	○
	RT22.01N-6.00GM	**LT22.01N-6.00GM**	6.00	5.56	12.7	5.5	●	●

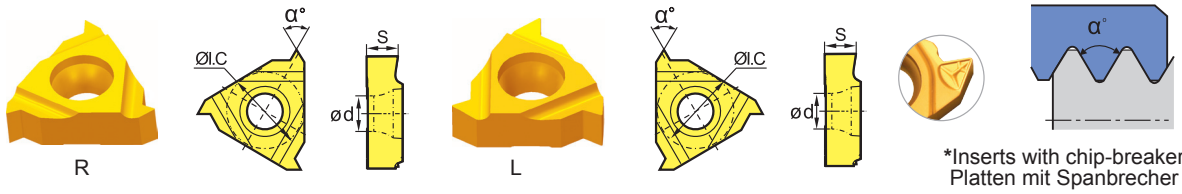
● ex stock · ab Lager ○ on demand · auf Anfrage

General pitch thread insert (partical profil)
Allgemeiner Einsatz (Teilprofil)



*Inserts with chip-breakers
Platten mit Spanbrecher

		Type · Typ		Dimension (mm) Abmessung					Grade · Sorte	
		Right hand Rechtsausführung	Left hand Linksausführung	Pitch·Steigung (T.P.i)	S	ØI.C	ød	α°	YBG201	
									R	L
External · Außen	60°	**RT16.01W-A60**	**LT16.01W-A60**	0.5-1.5(48-16)	3.97	9.525	4.4	60°	●	●
		RT16.01W-G60	**LT16.01W-G60**	1.75-3.0(14-8)	3.97	9.525	4.4	60°	●	●
		RT16.01W-G60P*	**LT16.01W-G60P***	1.75-3.0(14-8)	3.97	9.525	4.4	60°	○	●
		RT16.01W-AG60	**LT16.01W-AG60**	0.5-3.0(48-8)	3.97	9.525	4.4	60°	●	●
		RT22.01W-N60	**LT22.01W-N60P***	3.5-5.0(7-5)	5.56	12.7	5.5	60°	●	○
	55°	**RT16.01W-A55**	**LT16.01W-A55**	0.5-1.5(48-16)	3.97	9.525	4.4	55°	○	●
		RT16.01W-G55	**LT16.01W-G55**	1.75-3.0(14-8)	3.97	9.525	4.4	55°	●	●
		RT16.01W-G55P*	**LT16.01W-G55P***	1.75-3.0(14-8)	3.97	9.525	4.4	55°	●	●
		RT16.01W-AG55	**LT16.01W-AG55**	0.5-3.0(48-8)	3.97	9.525	4.4	55°	●	○
		RT22.01W-N55P*	**LT22.01W-N55**	3.5-5.0(7-5)	5.56	12.7	5.5	55°	○	○



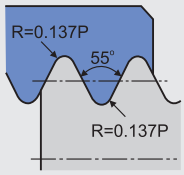
*Inserts with chip-breakers
Platten mit Spanbrecher

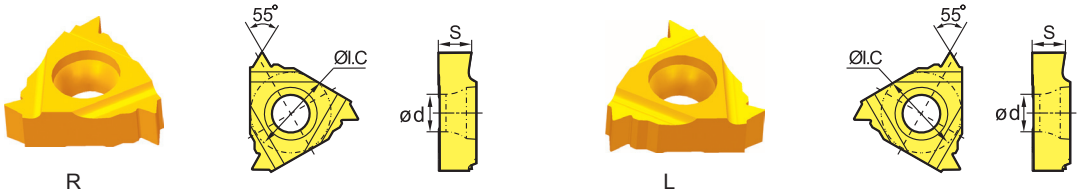
		Type · Typ		Dimension (mm) Abmessung					Grade · Sorte	
		Right hand Rechtsausführung	Left hand Linksausführung	Pitch·Steigung (T.P.i)	S	ØI.C	ød	α°	YBG201	
									R	L
Internal·Innen	60°	**RT16.01N-A60**	**LT16.01N-A60**	0.5-1.5 (48-16)	3.97	9.525	4.4	60°	●	○
		RT16.01N-G60	**LT16.01N-G60**	1.75-3.0	3.97	9.525	4.4	60°	●	○
		RT16.01N-G60P*	**LT16.01N-G60P***	1.75-3.0	3.97	9.525	4.4	60°	○	○
		RT16.01N-AG60	**LT16.01N-AG60**	0.5-3.0 (48-8)	3.97	9.525	4.4	60°	●	○
		RT22.01N-N60	**LT22.01N-N60**	3.5-5.0 (7-5)	5.56	12.7	5.5	60°	○	○
	55°	**RT16.01N-A55**	**LT16.01N-A55**	0.5-1.5(48-16)	3.97	9.525	4.4	55°	○	○
		RT16.01N-G55	**LT16.01N-G55**	1.75-3.0(14-8)	3.97	9.525	4.4	55°	●	○
		RT16.01N-G55P*	**LT16.01N-G55P***	1.75-3.0(14-8)	3.97	9.525	4.4	55°	●	●
		RT16.01N-AG55	**LT16.01N-AG55**	0.5-3.0(48-8)	3.97	9.525	4.4	55°	○	●
		RT22.01N-N55	**LT22.01N-N55**	3.5-5.0(7-5)	5.56	12.7	5.5	55°	○	○

● ex stock · ab Lager ○ on demand · auf Anfrage

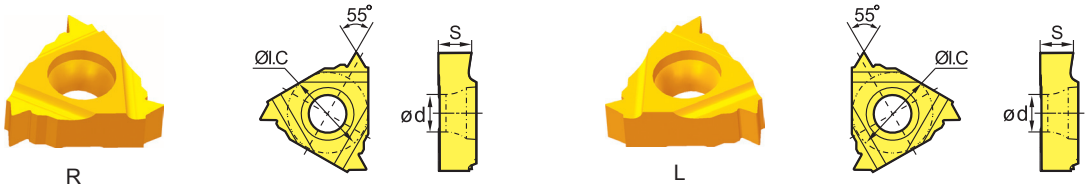
Withworth thread insert
Withworth Rohrgewinde

ISO 228·1:1982,
DIN 259, B.S.84:1956
tolerances:Medium class A





	Type · Typ		Dimension (mm) Abmessung				Grade · Sorte	
	Right hand Rechtsausführung	Left hand Linksausführung	Pitch·Steigung (T.P.i)	S	ØI.C	ød	YBG201 R	YBG201 L
External · Außen	**RT16.01W-8W**	**LT16.01W-8W**	8	3.97	9.525	4.4	●	●
	RT16.01W-9W	**LT16.01W-9W**	9	3.97	9.525	4.4	●	●
	RT16.01W-10W	**LT16.01W-10W**	10	3.97	9.525	4.4	●	●
	RT16.01W-11W	**LT16.01W-11W**	11	3.97	9.525	4.4	●	●
	RT16.01W-12W	**LT16.01W-12W**	12	3.97	9.525	4.4	●	●
	RT16.01W-14W	**LT16.01W-14W**	14	3.97	9.525	4.4	●	●
	RT16.01W-16W	**LT16.01W-16W**	16	3.97	9.525	4.4	●	●

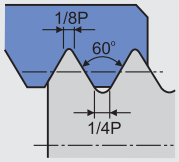


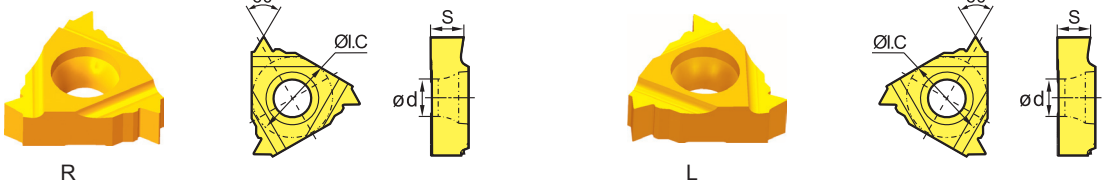
	Type · Typ		Dimension (mm) Abmessung				Grade · Sorte	
	Right hand Rechtsausführung	Left hand Linksausführung	Pitch·Steigung (T.P.i)	S	ØI.C	ød	YBG201 R	YBG201 L
Internal·Innen	**RT16.01N-8W**	**LT16.01N-8W**	8	3.97	9.525	4.4	●	●
	RT16.01N-9W	**LT16.01N-9W**	9	3.97	9.525	4.4	●	●
	RT16.01N-10W	**LT16.01N-10W**	10	3.97	9.525	4.4	●	●
	RT16.01N-11W	**LT16.01N-11W**	11	3.97	9.525	4.4	●	●
	RT16.01N-12W	**LT16.01N-12W**	12	3.97	9.525	4.4	●	●
	RT16.01N-14W	**LT16.01N-14W**	14	3.97	9.525	4.4	●	●
	RT16.01N-16W	**LT16.01N-16W**	16	3.97	9.525	4.4	●	●

● ex stock · ab Lager ○ on demand · auf Anfrage

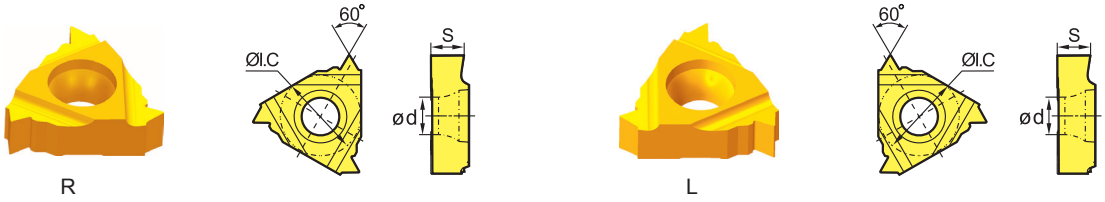
UN full profile · UN Vollprofil

ASME B1.1-1989
tolerances:2A·2B





	Type · Typ		Dimension (mm) Abmessung				Grade · Sorte	
	Right hand Rechtsausführung	Left hand Linksausführung	Pitch·Steigung (T.P.i)	S	ØI.C	ød	YBG201	
							R	L
External · Außen	**RT16.01W-8UN**	**LT16.01W-8UN**	8	3.97	9.525	4.4	○	○
	RT16.01W-10UN	**LT16.01W-10UN**	10	3.97	9.525	4.4	●	●
	RT16.01W-12UN	**LT16.01W-12UN**	12	3.97	9.525	4.4	●	●
	RT16.01W-14UN	**LT16.01W-14UN**	14	3.97	9.525	4.4	●	●
	RT16.01W-16UN	**LT16.01W-16UN**	16	3.97	9.525	4.4	●	●
	RT16.01W-18UN	**LT16.01W-18UN**	18	3.97	9.525	4.4	●	●
	RT16.01W-20UN	**LT16.01W-20UN**	20	3.97	9.525	4.4	●	●

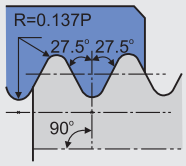


	Type · Typ		Dimension (mm) Abmessung				Grade · Sorte	
	Right hand Rechtsausführung	Left hand Linksausführung	Pitch·Steigung (T.P.i)	S	ØI.C	ød	YBG201	
							R	L
Internal · Innen	**RT16.01N-8UN**	**LT16.01N-8UN**	8	3.97	9.525	4.4	○	○
	RT16.01N-10UN	**LT16.01N-10UN**	10	3.97	9.525	4.4	●	●
	RT16.01N-12UN	**LT16.01N-12UN**	12	3.97	9.525	4.4	●	●
	RT16.01N-14UN	**LT16.01N-14UN**	14	3.97	9.525	4.4	●	●
	RT16.01N-16UN	**LT16.01N-16UN**	16	3.97	9.525	4.4	●	●
	RT16.01N-18UN	**LT16.01N-18UN**	18	3.97	9.525	4.4	●	●
	RT16.01N-20UN	**LT16.01N-20UN**	20	3.97	9.525	4.4	●	●

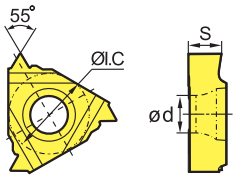
● ex stock · ab Lager ○ on demand · auf Anfrage

British standard taper pipe thread insert
Rohrgewinde für Dampf-, Gas- und Wasserleitungen

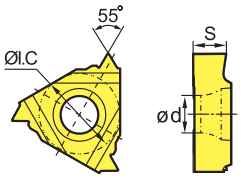
ISO 7·1:1994
B.S.21:1985
Standard BSPT




R

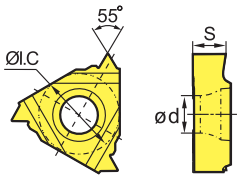



L

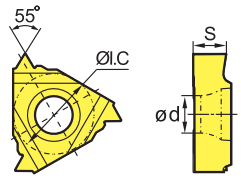


	Type · Typ		Dimension (mm) Abmessung				Grade · Sorte	
	Right hand Rechtsausführung	Left hand Linksausführung	Pitch·Steigung (T.P.i)	S	ØI.C	ød	YBG201	
							R	L
External · Außen	**RT16.01W-11 BSPT**	**LT16.01W-11 BSPT**	11	3.97	9.525	4.4	●	●
	RT16.01W-14 BSPT	**LT16.01W-14 BSPT**	14	3.97	9.525	4.4	●	●
	RT16.01W-19 BSPT	**LT16.01W-19 BSPT**	19	3.97	9.525	4.4	●	●
	RT16.01W-28 BSPT	**LT16.01W-28 BSPT**	28	3.97	9.525	4.4	●	●


R




L

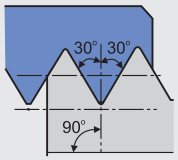


	Type · Typ		Dimension (mm) Abmessung				Grade · Sorte	
	Right hand Rechtsausführung	Left hand Linksausführung	Pitch·Steigung (T.P.i)	S	ØI.C	ød	YBG201	
							R	L
Internal · Innen	**RT16.01N-11 BSPT**	**LT16.01N-11 BSPT**	11	3.97	9.525	4.4	●	●
	RT16.01N-14 BSPT	**LT16.01N-14 BSPT**	14	3.97	9.525	4.4	●	●
	RT16.01N-19 BSPT	**LT16.01N-19 BSPT**	19	3.97	9.525	4.4	●	●
	RT16.01N-28 BSPT	**LT16.01N-28 BSPT**	28	3.97	9.525	4.4	●	●

● ex stock · ab Lager ○ on demand · auf Anfrage

NPT American standard taper pipe with a shoulder
Amerikanisches kegeliges Rohrgewinde

ASME B1.20.1-1983
Standard NPT





	Type · Typ		Dimension (mm) Abmessung				Grade · Sorte	
	Right hand Rechtsausführung	Left hand Linksausführung	Pitch·Steigung (T.P.i)	S	ØI.C	ød	YBG201	
							R	L
External · Außen	**RT16.01W-8 NPT**	**LT16.01W-8NPT**	8	3.97	9.525	4.4	○	○
	RT16.01W-11.5 NPT	**LT16.01W-11.5NPT**	11.5	3.97	9.525	4.4	○	○
	RT16.01W-14 NPT	**LT16.01W-14NPT**	14	3.97	9.525	4.4	○	○
	RT16.01W-18 NPT	**LT16.01W-18NPT**	18	3.97	9.525	4.4	○	○
	RT16.01W-27 NPT	**LT16.01W-27NPT**	27	3.97	9.525	4.4	○	○



	Type · Typ		Dimension (mm) Abmessung				Grade · Sorte	
	Right hand Rechtsausführung	Left hand Linksausführung	Pitch·Steigung (T.P.i)	S	ØI.C	ød	YBG201	
							R	L
Internal·Innen	**RT16.01N-8 NPT**	**LT16.01N-8 NPT**	8	3.97	9.525	4.4	○	○
	RT16.01N-11.5 NPT	**LT16.01N-11.5 NPT**	10	3.97	9.525	4.4	○	○
	RT16.01N-14 NPT	**LT16.01N-14 NPT**	12	3.97	9.525	4.4	○	○
	RT16.01N-18 NPT	**LT16.01N-18 NPT**	18	3.97	9.525	4.4	○	○
	RT16.01N-27 NPT	**LT16.01N-27 NPT**	20	3.97	9.525	4.4	○	○

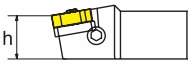
● ex stock · ab Lager ○ on demand · auf Anfrage

Threading toolholders code key
Kennzeichnung für Gewindehalter

Type of screw / Bearbeitungsart

W	External threading / Außengewinde
N	Internal threading / Innengewinde

Height / Höhe



Integers to be proceeded by 0
eg: h=8 indicated by 08

Tool length / Schaftlänge

Code	Length / Länge
H	100
K	125
M	150
P	170
Q	180
R	200
S	250
T	300
U	350

S W R 20 20 K 16

Clamping system / Klemmsystem



C

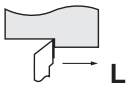
Top clamping



S

Screw on

Hand of tools / Ausführung

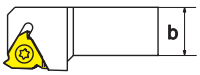


L lefthand / Links



R Righthand / Rechts

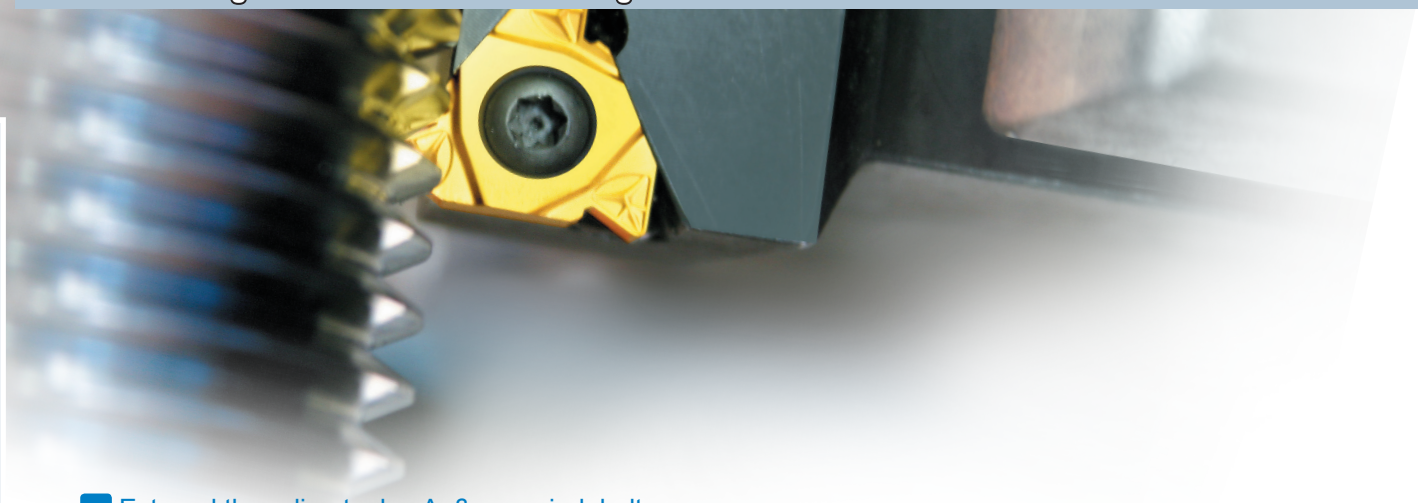
Shank width / Schaftbreite



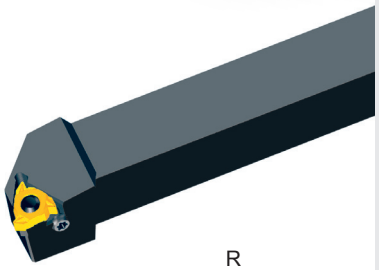
Integers to be proceeded by 0
eg: h=8 indicated by 08

Insert Dimension / Plattenabmessung

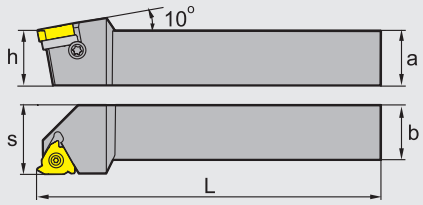
Cutting edge length	IC (mm)
22	6.35
16	9.525
11	12.7



External threading tools · Außengewindehalter



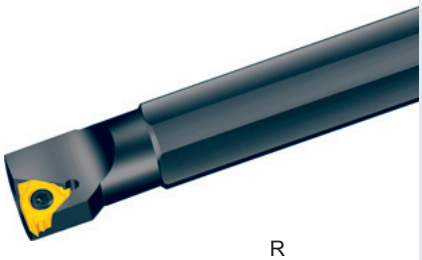
R



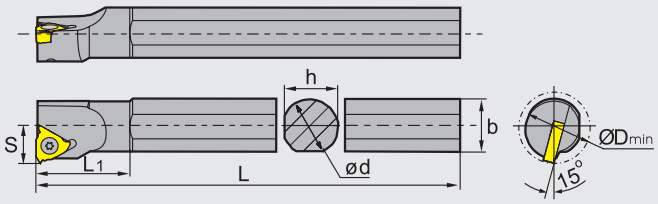
Type · Typ		Stock Lager	Dimension (mm) Abmessung a	h	b	L	s	Inserts Wendeschneidplatten	Screw Schraube	Shim Unterlage	Shim screw Schraube	Wrench Schlüssel
												
SWR	1616H16	●	16	16	16	100	20	RT16.01W-****	I60M3.5×12	MT16-**M	SM4×8C	WT15IP
	2020K16	●	20	20	20	125	25					
	2525M16	●	25	25	25	150	32					
	3225P16	●	32	32	25	170	32					
	3232P16	●	32	32	32	170	40					
	2525M22	●	25	25	25	150	32	RT22.01W-****	I60M5×17	MT22-**M	SM4×8C	WT15IP WT20IP
	3225P22	○	32	32	25	170	32					
	3232P22	●	32	32	32	170	40					
	4040S22	○	40	40	40	250	50					
SWL	1616H16	●	16	16	16	100	20	LT16.01W-****	I60M3.5×12	MT16-**M	SM4×8C	WT15IP
	2020K16	●	20	20	20	125	25					
	2525M16	●	25	25	25	150	32					
	3225P16	●	32	32	25	170	32					
	3232P16	○	32	32	32	170	40					
	2525M22	●	25	25	25	150	32	LT22.01W-****	I60M5×17	MT22-**M	SM4×8C	WT15IP WT20IP
	3225P22	○	32	32	25	170	32					
	3232P22	●	32	32	32	170	40					
	4040S22	○	40	40	40	250	50					

● ex stock · ab Lager ○ on demand · auf Anfrage

Internal threading tools · Innengewindehalter



R



Type · Typ		Stock Lager	Dimension (mm) Abmessung							Inserts Wendeschneidplatten	Screw Schraube	Shim Unterlage	Shim screw Schraube	Wrench Schlüssel
			d	L	b	DmIn	s	h	L1					
SNR	0016K11	●	16	125	16	12	10	15	20.9	RT11.01N-****	I60 M2.5×6.5	---	---	WT07IP
	0016M11	●	16	150	15.5	16	10.5	15	25.9					
	0016M16	●	16	150	15.5	20	12	15	27	RT16.01N-****	I60 M3.5×8	---	---	WT15IP
	0020M16	●	20	150	19	25	14	18	28.7		I60 M3.5×12	MT16-**M	SM4×8C	WT15IP
	0020Q16	●	20	180	19	25	14	18	34					
	0025M16	●	25	150	24	32	17	23	28.8					
	0032R16	●	32	200	31	40	22	30	30.9					
	0032S16	●	32	250	31	40	22	30	30.9					
	0040T16	●	40	300	38.5	50	27	37	31.5					
	0050U16	○	50	350	49.5	63	35	49	40.2					
	0020Q22	○	20	180	21.5	25	15	18	35	RT22.01W-****	I60 M5×10			WT20IP
	0025R22	●	25	200	24	32	19	23	39		I60 M5×17	MT22-**M	SM4×8C	WT15IP WT20IP
	0032S22	●	32	250	31	40	22	30	36.4					
	0040T22	○	40	300	38.5	50	27	37	37.2					
	0050U22	●	50	350	48.5	63	35	47	42.6					
SNL	0016K11	●	16	125	16	12	10	15	20.9	RT11.01N-****	I60 M2.5×6.5	---	---	WT07IP
	0016M11	●	16	150	15.5	16	10.5	15	25.9					
	0016M16	●	16	150	15.5	20	12	15	27	RT16.01N-****	I60 M3.5×8	---	---	WT15IP
	0020M16	○	20	150	19	25	14	18	28.7		I60 M3.5×12	MT16-**M	SM4×8C	WT15IP
	0020Q16	●	20	180	19	25	14	18	34					
	0025M16	●	25	150	24	32	17	23	28.8					
	0032R16	○	32	200	31	40	22	30	30.9					
	0032S16	○	32	250	31	40	22	30	30.9					
	0040T16	●	40	300	38.5	50	27	37	31.5					
	0050U16	○	50	350	49.5	63	35	49	40.2					
	0020Q22	○	20	180	21.5	25	15	18	35	RT22.01W-****	I60 M5×10	---	---	WT20IP
	0025R22	○	25	200	24	32	19	23	39		I60 M5×17	MT22-**M	SM4×8C	WT15IP WT20IP
	0032S22	○	32	250	31	40	22	30	36.4					
	0040T22	○	40	300	38.5	50	27	37	37.2					
	0050U22	●	50	350	48.5	63	35	47	42.6					

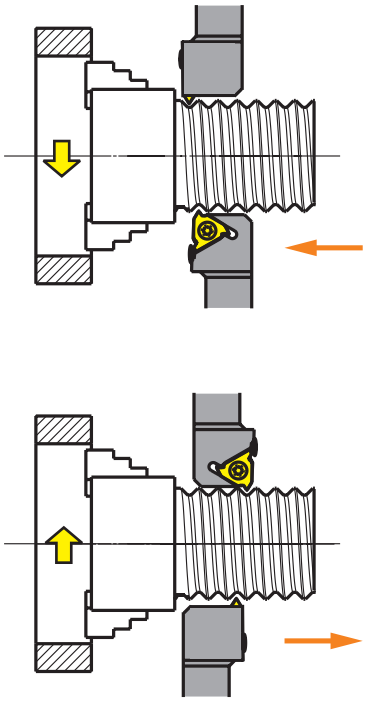
● ex stock · ab Lager ○ on demand · auf Anfrage

Steps to get the best threading result:
Bearbeitungsfolge für beste Ergebnisse beim Geschwindeschneiden:

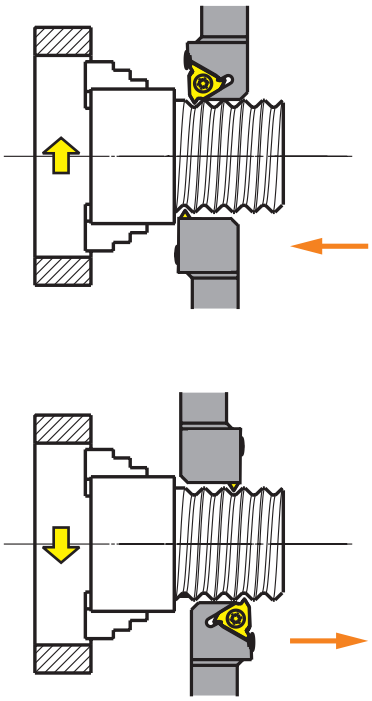
1. **Select thread machining method**
   Wahl der Gewindedrehmethode
2. **Decide helical angle, select shim**
   Auswahl des Winkels und der Unterlage
3. **Choose insert and toolholder size**
   Auswahl der Halter und Platten
4. **By checking reference table of standard threading program, select feasible cutting parameters.**
   Auswahl der Schnittparameter
5. **Select feed way**
   Auswahl der Schnittrichtung

Thread machining method · Gewindedrehmethode

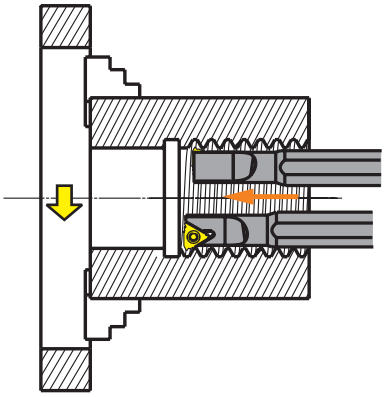
External threading machining (Right thread)
Außenbearbeitung (Rechtsausführung)



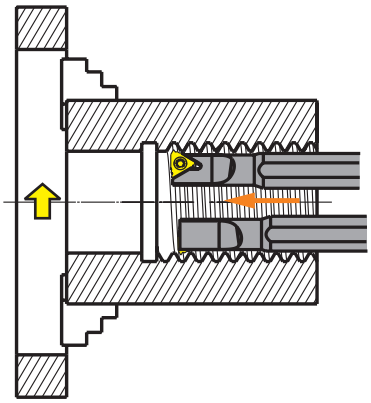
External threading machining (Left thread)
Außenbearbeitung (Linksausführung)



Internal threading machining (Right thread)
Innenbearbeitung (Rechtsausführung)



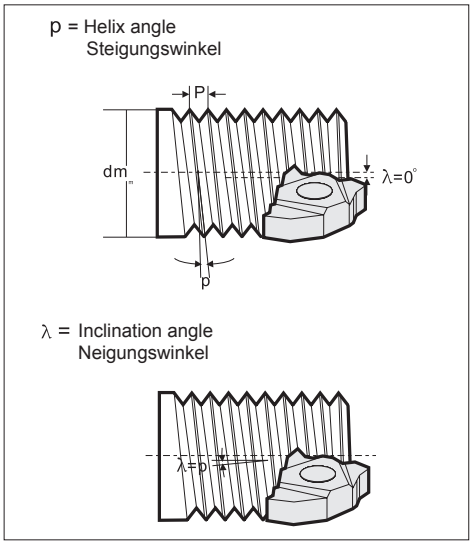
Internal threading machining (Left thread)
Innenbearbeitung (Linksausführung)



Decide helical angle, select shim · Auswahl des Winkels und der Unterlage

The flank clearance angles of the thread profile is dependent on the helix angle of the thread. The helix angle of the thread must coincide with the insert's angle of inclination angle as far as possible to get the ideal profile, to avoid longer unfavourable wear on one of the flanks and thus to ensure tool life.

Die Flankenfreiwinkel des Gewindeprofils sind vom Steigungswinkel des Gewindes abhängig.
Der Steigungswinkel des Gewindes muss mit dem Neigungswinkel der Gewindeplatte soweit wie möglich übereinstimmen, um Profil-Genauigkeit zu erzielen, ungleichmäßigen Freiflächenverschleiß der Gewindeplatte zu vermeiden und eine längere Standzeit zu gewährleisten.



$$\lambda = \arctan \frac{p}{d_2 \times \pi}$$

p = Pitch
Steigung
d_2= Effective diameter of thread
Flankendurchmesser
λ = Inclination angle
Neigungswinkel

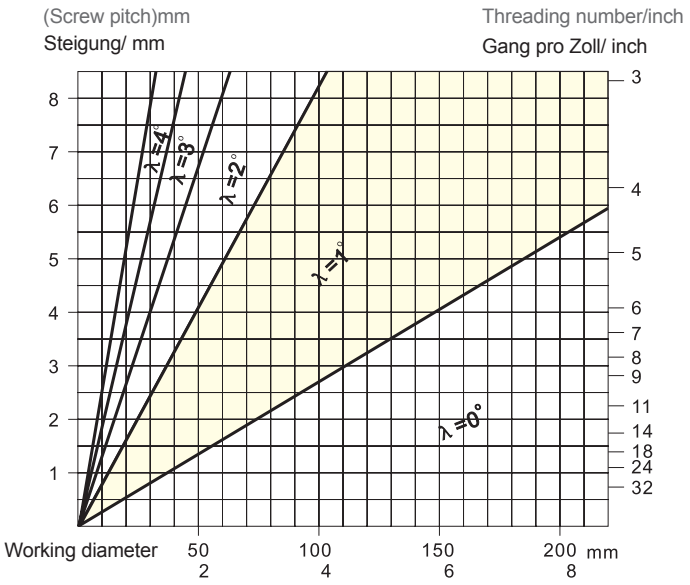
Shim specification table are as following:
Wahl der Unterlegplatte

Screw pitch range Steigungs-bereich	Insert dimensions Abmessung	Inclined angle Neigungs-winkel	Shim Unterlage
0.5-3.0	16	0 1 2 3	MT16-00M MT16-01M MT16-02M MT16-03M
3.5-6.0	22	0 1 2 3	MT22-00M MT22-01M MT22-02M MT22-03M

Shim for λ= 1° is as the standard shim with the toolholder.

Die Unterlage λ=1° wird mit dem Halter geliefert.

Select shim:
Wahl der richtigen Unterlage:



Select proper inserts and size of toolholder (Please refer to detailed table of threading tools and inserts)
Ausgewählt zweckmäßige Gewindeplatten und Haltergrößen

Parameter table for threading machining program under different conditions
Parametertabelle für das Gewindedrehprogramm für unterschiedliche Bedingungen

Table of recommended infeed for metric **ISO external threading with wiper edge**
Empfohlene Zustellungswerte für metrische **ISO Außengewinde mit Wiper**

Pitch(mm) / Steigung	1.0	1.25	1.5	1.75	2.0	2.5	3.0	4.0	5.0
Total feed (a) Gesamtzustellung	0.72	0.86	1.02	1.17	1.33	1.63	1.94	2.58	3.21
Cutting times(nap) Anzahl der Schnitte	5	6	7	8	9	11	13	15	17
Cutting order Schnittaufteilung	Radial X · Axial Z								
	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z
1	0.20/-	0.20/-	0.21/-	0.22/-	0.24/-	0.25/-	0.26/-	0.35/-	0.40/-
2	0.18/0.10	0.18/0.10	0.18/0.10	0.20/0.12	0.22/0.13	0.24/0.14	0.24/0.14	0.30/0.17	0.35/0.20
3	0.16/0.09	0.14/0.09	0.18/0.10	0.18/0.10	0.20/0.12	0.21/0.12	0.20/0.12	0.25/0.14	0.30/0.17
4	0.10/0.06	0.10/0.08	0.15/0.09	0.15/0.09	0.15/0.09	0.18/0.10	0.20/0.12	0.20/0.12	0.28/0.16
5	0.08/-	0.08/0.06	0.12/0.07	0.13/0.08	0.12/0.07	0.15/0.09	0.18/0.10	0.18/0.10	0.25/0.14
6			0.10/0.06	0.11/0.06	0.12/0.07	0.12/0.07	0.15/0.09	0.18//0.10	0.20/0.12
7			0.08/-	0.10/0.06	0.10/0.06	0.12/0.07	0.13/0.08	0.16/0.09	0.18/0.10
8				0.08/-	0.10/0.06	0.10/0.06	0.12/0.07	0.15/0.09	0.16/0.09
9					0.08/-	0.10/0.06	0.10/0.06	0.15/0.09	0.15/0.09
10						0.08/0.05	0.10/0.06	0.13/0.08	0.15/0.09
11						0.08/-	0.08/0.06	0.12/0.07	0.13/0.08
12							0.08/0.05	0.12/0.07	0.13/0.08
13								0.11/0.06	0.12/0.07
14								0.10/0.06	0.12/0.07
15								0.08/-	0.11/0.06
16									0.10/0.06
17									0.08/-

Table of recommended infeed for metric **ISO internal threading with wiper edge**
Empfohlene Zustellungswerte für metrische **ISO Innengewinde mit Wiper**

Pitch(mm) / Steigung	1.00	1.25	1.5	1.75	2.0	2.5	3.0	4.0	5.0
Total feed (a) Gesamtzustellung	0.62	0.77	0.92	1.06	1.21	0.15	1.79	2.36	2.95
Cutting times(nap) Anzahl der Schnitte	5	6	7	8	9	11	13	15	17
Cutting order Schnittaufteilung	Radial X · Axial Z								
	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z
1	0.18/-	0.20/-	0.22/-	0.23/-	0.24/-	0.25/-	0.26/-	0.30/-	0.32/-
2	0.14/0.08	0.15/0.09	0.16/0.09	0.16/0.09	0.18/0.10	0.20/0.12	0.20/0.12	0.25/0.14	0.28/0.16
3	0.12/0.07	0.12/0.07	0.14/0.08	0.14/0.08	0.15/0.09	0.15/0.09	0.20/0.12	0.22/0.13	0.25/0.14
4	0.10/0.06	0.12/0.07	0.12/0.07	0.13/0.08	0.14/0.08	0.15/0.09	0.18/0.10	0.20/0.12	0.22/0.13
5	0.08/-	0.10/0.06	0.11/0.06	0.12/0.07	0.12/0.07	0.13/0.08	0.15/0.09	0.18/0.10	0.21/0.12
6			0.09/0.05	0.10/0.06	0.11/0.06	0.12/0.07	0.12/0.07	0.15/0.09	0.20/0.12
7			0.08/-	0.10/0.06	0.10/0.06	0.12/0.07	0.12/0.07	0.15/0.09	0.18/0.10
8				0.08/-	0.09/0.05	0.10/0.06	0.10/0.06	0.15/0.09	0.18/0.10
9					0.08/-	0.10/0.06	0.10/0.06	0.12/0.07	0.15/0.09
10						0.09/0.05	0.10/0.06	0.12/0.07	0.15/0.09
11						0.08/-	0.10/0.06	0.12/0.07	0.15/0.09
12							0.08/0.05	0.11/0.06	0.15/0.09
13								0.11/0.06	0.12/0.07
14								0.10/0.06	0.11/0.06
15								0.08/-	0.10/0.06
16									0.10/0.06
17									0.08/-



Table of recommended infeed for **American unified standard external threading inserts**
Empfohlene Zustellungswerte für **American unified standard Außengewinde Schneidplatten**

Pitch (mm) Steigung	24	20	18	16	14	12	11	10	9	8	7	6	5
Total feed (a)/ Gesamtzustellung	0.649	0.779	0.866	0.974	1.113	1.299	1.416	1.558	1.731	1.948	2.226	2.597	3.116
Cutting times(nap) Anzahl der Schnitte	5	6	6	7	9	9	10	11	12	13	14	15	16
Cutting order Schnittaufteilung	Radial X · Axial Z												
	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z
1	0.206 / —	0.210 / —	0.233 / —	0.226 / —	0.196 / —	0.229 / —	0.220 / —	0.214 / —	0.210 / —	0.211 / —	0.213 / —	0.218 / —	0.229 / —
2	0.148 / 0.086	0.163 / 0.094	0.181 / 0.104	0.188 / 0.109	0.189 / 0.110	0.222 / 0.128	0.228 / 0.132	0.240 / 0.139	0.256 / 0.148	0.276 / 0.160	0.304 / 0.176	0.343 / 0.198	0.399 / 0.230
3	0.114 / 0.066	0.125 / 0.072	0.139 / 0.080	0.145 / 0.083	0.146 / 0.084	0.170 / 0.098	0.176 / 0.102	0.184 / 0.106	0.196 / 0.113	0.212 / 0.122	0.234 / 0.135	0.263 / 0.152	0.306 / 0.177
4	0.096 / 0.055	0.105 / 0.061	0.117 / 0.068	0.122 / 0.070	0.123 / 0.071	0.143 / 0.083	0.148 / 0.086	0.155 / 0.090	0.165 / 0.095	0.179 / 0.103	0.197 / 0.114	0.222 / 0.128	0.258 / 0.149
5	0.085 / 0.049	0.093 / 0.054	0.103 / 0.059	0.107 / 0.062	0.108 / 0.062	0.126 / 0.073	0.131 / 0.075	0.137 / 0.079	0.146 / 0.084	0.158 / 0.091	0.173 / 0.100	0.195 / 0.113	0.227 / 0.131
6		0.084 / 0.048	0.093 / 0.054	0.097 / 0.056	0.098 / 0.056	0.114 / 0.066	0.118 / 0.068	0.124 / 0.072	0.132 / 0.076	0.142 / 0.082	0.157 / 0.091	0.177 / 0.102	0.205 / 0.119
7				0.089 / 0.052	0.090 / 0.052	0.105 / 0.061	0.109 / 0.063	0.114 / 0.066	0.121 / 0.070	0.131 / 0.076	0.144 / 0.083	0.163 / 0.094	0.189 / 0.109
8					0.084 / 0.048	0.098 / 0.056	0.101 / 0.058	0.106 / 0.061	0.113 / 0.065	0.122 / 0.070	0.134 / 0.078	0.151 / 0.087	0.176 / 0.101
9					0.079 / 0.045	0.092 / 0.053	0.095 / 0.055	0.100 / 0.057	0.106 / 0.061	0.114 / 0.066	0.126 / 0.073	0.142 / 0.082	0.165 / 0.095
10							0.090 / 0.052	0.094 / 0.054	0.100 / 0.058	0.108 / 0.063	0.119 / 0.069	0.134 / 0.078	0.156 / 0.090
11								0.090 / 0.052	0.095 / 0.055	0.103 / 0.059	0.113 / 0.065	0.128 / 0.074	0.149 / 0.086
12									0.091 / 0.053	0.098 / 0.057	0.108 / 0.063	0.122 / 0.071	0.142 / 0.082
13										0.094 / 0.054	0.104 / 0.060	0.117 / 0.068	0.136 / 0.079
14											0.100 / 0.058	0.113 / 0.065	0.131 / 0.076
15												0.109 / 0.063	0.126 / 0.073
16													0.122 / 0.071

Table of recommended infeed for **American unified standard internal threading inserts**
Empfohlene Zustellungswerte für **American unified standard Innengewinde Schneidplatten**

Pitch (mm) Steigung	24	20	18	16	14	12	11	10	9	8	7	6	5
Total feed (a)/ Gesamtzustellung	0.573	0.687	0.764	0.860	0.982	1.146	1.250	1.375	1.528	1.719	1.964	2.291	2.750
Cutting times(nap) Anzahl der Schnitte	5	6	6	7	8	9	9	10	11	12	13	14	15
Cutting order Schnittaufteilung	Radial X · Axial Z												
	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z
1	0.193 / —	0.200 / —	0.222 / —	0.219 / —	0.220 / —	0.228 / —	0.250 / —	0.247 / —	0.246 / —	0.252 / —	0.262 / —	0.278 / —	0.302 / —
2	0.127 / 0.073	0.239 / 0.081	0.155 / 0.089	0.161 / 0.093	0.173 / 0.100	0.190 / 0.110	0.207 / 0.120	0.216 / 0.125	0.229 / 0.132	0.247 / 0.142	0.271 / 0.156	0.304 / 0.176	0.353 / 0.204
3	0.098 / 0.056	0.107 / 0.062	0.119 / 0.069	0.124 / 0.072	0.132 / 0.076	0.146 / 0.084	0.159 / 0.092	0.166 / 0.096	0.176 / 0.101	0.189 / 0.109	0.208 / 0.120	0.234 / 0.135	0.271 / 0.156
4	0.082 / 0.048	0.090 / 0.052	0.100 / 0.058	0.104 / 0.060	0.112 / 0.064	0.123 / 0.071	0.134 / 0.077	0.140 / 0.081	0.148 / 0.086	0.160 / 0.092	0.175 / 0.101	0.197 / 0.114	0.228 / 0.132
5	0.073 / 0.042	0.079 / 0.046	0.088 / 0.051	0.092 / 0.053	0.098 / 0.057	0.108 / 0.062	0.118 / 0.068	0.123 / 0.071	0.130 / 0.075	0.141 / 0.081	0.1543 / 0.089	0.173 / 0.100	0.201 / 0.116
6		0.072 / 0.041	0.080 / 0.046	0.083 / 0.048	0.089 / 0.051	0.098 / 0.056	0.107 / 0.062	0.111 / 0.064	0.118 / 0.068	0.127 / 0.073	0.140 / 0.081	0.157 / 0.091	0.182 / 0.105
7				0.077 / 0.044	0.082 / 0.047	0.090 / 0.052	0.098 / 0.057	0.102 / 0.059	0.108 / 0.063	0.117 / 0.067	0.128 / 0.074	0.144 / 0.083	0.167 / 0.097
8					0.076 / 0.044	0.084 / 0.048	0.091 / 0.053	0.095 / 0.055	0.101 / 0.058	0.109 / 0.063	0.119 / 0.069	0.134 / 0.078	0.156 / 0.090
9						0.079 / 0.045	0.086 / 0.050	0.090 / 0.052	0.095 / 0.055	0.102 / 0.059	0.112 / 0.065	0.126 / 0.073	0.146 / 0.084
10								0.085 / 0.049	0.090 / 0.052	0.097 / 0.056	0.106 / 0.061	0.119 / 0.069	0.138 / 0.080
11									0.085 / 0.049	0.092 / 0.053	0.101 / 0.058	0.113 / 0.065	0.131 / 0.076
12										0.088 / 0.051	0.096 / 0.056	0.108 / 0.063	0.126 / 0.073
13											0.092 / 0.053	0.101 / 0.060	0.121 / 0.070
14												0.100 / 0.058	0.116 / 0.067
15													0.112 / 0.065

Table of recommended infeed for **British standard internal and external threading inserts**
Empfohlene Zustellungswerte für **British Standard Innen- und Außengewinde Schneidplatten**

Pitch(mm) Steigung	28	20	19	16	14	12	11	10	9	8	7	6	5
Total feed (a) Gesamtzustellung	0.581	0.813	0.856	1.017	1.162	1.355	1.479	1.626	1.807	2.033	2.324	2.711	3.253
Cutting times(nap) Anzahl der Schnitte	5	6	6	8	8	9	9	10	11	12	14	15	16
Cutting order Schnittaufteilung	Radial X · Axial Z												
	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z
1	0.179 / —	0.211 / —	0.223 / —	0.196 / —	0.223 / —	0.226 / —	0.246 / —	0.236 / —	0.230 / —	0.255 / —	0.195 / —	0.197 / —	0.204 / —
2	0.134 / 0.070	0.172 / 0.089	0.181 / 0.094	0.186 / 0.097	0.213 / 0.111	0.234 / 0.122	0.255 / 0.133	0.226 / 0.139	0.282 / 0.147	0.304 / 0.158	0.322 / 0.167	0.361 / 0.189	0.421 / 0.219
3	0.104 / 0.054	0.132 / 0.069	0.139 / 0.072	0.143 / 0.074	0.163 / 0.085	0.180 / 0.093	0.197 / 0.102	0.206 / 0.106	0.216 / 0.113	0.233 / 0.121	0.247 / 0.128	0.278 / 0.145	0.323 / 0.168
4	0.087 / 0.045	0.111 / 0.058	0.117 / 0.061	0.120 / 0.063	0.138 / 0.072	0.151 / 0.079	0.165 / 0.086	0.172 / 0.090	0.182 / 0.095	0.197 / 0.102	0.208 / 0.108	0.234 / 0.122	0.272 / 0.142
5	0.077 / 0.040	0.098 / 0.051	0.103 / 0.054	0.106 / 0.055	0.121 / 0.063	0.133 / 0.069	0.145 / 0.076	0.152 / 0.079	0.161 / 0.084	0.1738 / 0.090	0.183 / 0.095	0.207 / 0.108	0.240 / 0.125
6		0.089 / 0.046	0.093 / 0.049	0.096 / 0.050	0.110 / 0.057	0.121 / 0.063	0.131 / 0.068	0.137 / 0.071	0.145 / 0.076	0.157 / 0.082	0.166 / 0.086	0.187 / 0.097	0.217 / 0.113
7				0.088 / 0.046	0.101 / 0.052	0.111 / 0.058	0.121 / 0.063	0.126 / 0.066	0.134 / 0.070	0.144 / 0.075	0.152 / 0.079	0.172 / 0.089	0.200 / 0.104
8				0.082 / 0.043	0.093 / 0.049	0.103 / 0.054	0.113 / 0.059	0.117 / 0.061	0.124 / 0.065	0.134 / 0.070	0.142 / 0.074	0.160 / 0.083	0.186 / 0.097
9						0.097 / 0.050	0.106 / 0.055	0.110 / 0.057	0.117 / 0.061	0.126 / 0.066	0.133 / 0.069	0.150 / 0.078	0.174 / 0.091
10								0.104 / 0.054	0.111 / 0.058	0.119 / 0.062	0.126 / 0.066	0.142 / 0.074	0.165 / 0.086
11									0.105 / 0.055	0.113 / 0.059	0.120 / 0.062	0.135 / 0.070	0.157 / 0.082
12										0.108 / 0.056	0.114 / 0.060	0.129 / 0.067	0.150 / 0.078
13											0.110 / 0.055	0.124 / 0.064	0.144 / 0.075
14												0.119 / 0.062	0.138 / 0.072
15												0.115 / 0.060	0.133 / 0.069

Table of recommended infeed for **NPT internal and external threading inserts**
Empfohlene Zustellungswerte für **NPT Innen- und Außengewinde Schneidplatten**

Pitch (mm) / Steigung	27	18	14	11.5	8
Total feed (a)/ Gesamtzust.	0.75	1.129	1.451	1.767	2.54
Cutting times(nap) Anzahl der Schnitte	6	8	10	12	14
Cutting order Schnittaufteilung	Radial X · Axial Z				
	X/Z	X/Z	X/Z	X/Z	X/Z
1	0.19/-	0.22/-	0.240/-	0.24/-	0.255/-
2	0.15/0.087	0.181/0.104	0.200/0.115	0.208/0.120	0.250/0.144
3	0.13/0.075	0.152/0.088	0.170/0.098	0.182/0.105	0.245/0.141
4	0.11/0.063	0.141/0.081	0.150/0.086	0.168/0.097	0.230/0.133
5	0.09/0.052	0.131/0.075	0.140/0.081	0.155/0.089	0.210/0.121
6	0.08/0.46	0.121/0.070	0.130/0.075	0.145/0.084	0.195/0.112
7		0.101/0.058	0.120/0.069	0.138/0.079	0.180/0.104
8		0.082/0.047	0.110/0.063	0.124/0.072	0.175/0.101
9			0.100/0.058	0.117/0.067	0.170/0.098
10			0.091/0.052	0.105/0.060	0.155/0.089
11				0.095/0.055	0.140/0.080
12				0.090/0.052	0.125/0.072
13					0.110/0.063
14					0.100/0.058

Table of recommended infeed for **BSPT internal and external threading inserts**
Empfohlene Zustellungswerte für **BSPT Innen- und Außengewinde Schneidplatten**

Pitch (mm) / Steigung	28	19	14	11
Total feed (a)/ Gesamtzust.	0.581	0.856	1.162	1.479
Cutting times(nap) Anzahl der Schnitte	5	6	8	10
Cutting order Schnittaufteilung	Radial X · Axial Z			
	X/Z	X/Z	X/Z	X/Z
1	0.179/-	0.223/-	0.222/-	0.214/-
2	0.134/0.070	0.181/0.094	0.213/0.111	0.242/0.126
3	0.103/0.054	0.139/0.072	0.163/0.085	0.186/0.097
4	0.087/0.045	0.117/0.061	0.138/0.072	0.157/0.082
5	0.078/0.040	0.103/0.054	0.121/0.063	0.138/0.072
6		0.093/0.049	0.110/0.057	0.125//0.065
7			0.101/0.052	0.115/0.060
8			0.094/0.049	0.107/0.056
9				0.100/0.052
10				0.095//0.049

Recommended Cutting parameters · Empfohlene Schnittparameter

ISO	Workpiece Material Werkstück Material			Hardness HB	Grade · Sorte YBG201 Cutting speed(m·min) Schnittgeschwindigkeit (m·min)
P	Carbon steel Kohlenstoffstahl	C=0.15% C=0.35% C=0.60%		125 150 200	150-175 140-155 130-145
	Alloy steel legierter Stahl	Anneal Hardened Hardened Hardened		180 275 300 350	110-130 80-100 70-90 60-80
	High alloy steel Hochlegierter Stahl	Anneal Hardened		200 325	90-115 70-90
	Cast steel Gussstahl	Non-alloy low alloy high alloy Martensite steel 12%Mn		180 200 225 250	180-210 90-115 90-115 40-50
M	Stainless steel Rostfreier Stahl	Austenite		180	110-130
		Martensite·Ferrite		200	130-170
K	Malleable cast iron Temperguss	Ferrite Pearlite		130 230	110-140 85-105
	Gray cast iron Grauguss	Low tensile-strength High tensile-strength		180 260	110-140 90-115
	Nodular cast iron	Ferrite Pearlite		160 250	110-130 80-100
N	Al alloy Aluminiumlegierung	Non-aging treatment Aging treatment		60 100	1300-1450 450-500
	Cast aluminum alloy Aluminium-gusslegierung	Non-aging treatment Aging treatment		75 90	430-470 250-290
S	Heat resistant alloy Hitzebeständige Legierung	Iron Base	Anneal Aging	200 280	35-50 25-35
		Ni- Or Co-base	Anneal Aging Casting	250 350 320	15-25 10-20 10-15
H	Hardened steel gehärteter Stahl	Hardened steel		HRC55	40-50

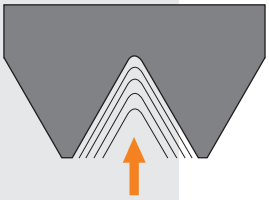
● ex stock · ab Lager ○ on demand · auf Anfrage

Infeed way of threading · Zustellarten beim Gewindedrehen

The Number of passes and infeed are the key points of threading operation. Please choose the cutting parameters with the recommended form according to experience data. In case of breakages or to much wear. Please have a look at page 302 (Troubleshooting).

Die Anzahl der Durchgänge und die Zustellungsgröße sind ein entscheidender Faktor bei der Gewindebearbeitung. Die empfohlenen Daten sind als Startwerte zu betrachten. Im Falle von erhöhten Verschleiß, schauen Sie bitte auf Seite 302 (Problemlösung).

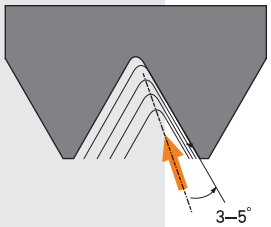
Radial infeed
Radiale Zustellung



Radial infeed requires low cutting depth, sharp cutting edge and tough grade. It is recommended when the pitch is smaller than 2mm, not ideal for material with long chips.

Radiale Zustellung fordert eine niedrige Schnitttiefe, scharfe Schneidkante und zähe Sorte.

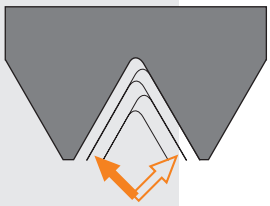
Modified flank infeed
Modifizierte Flankenzustellung



Infeed at an angle of 3-5° to the flank of the teeth. It is easy for chips flow. Suitable for long chip material and internal threading.

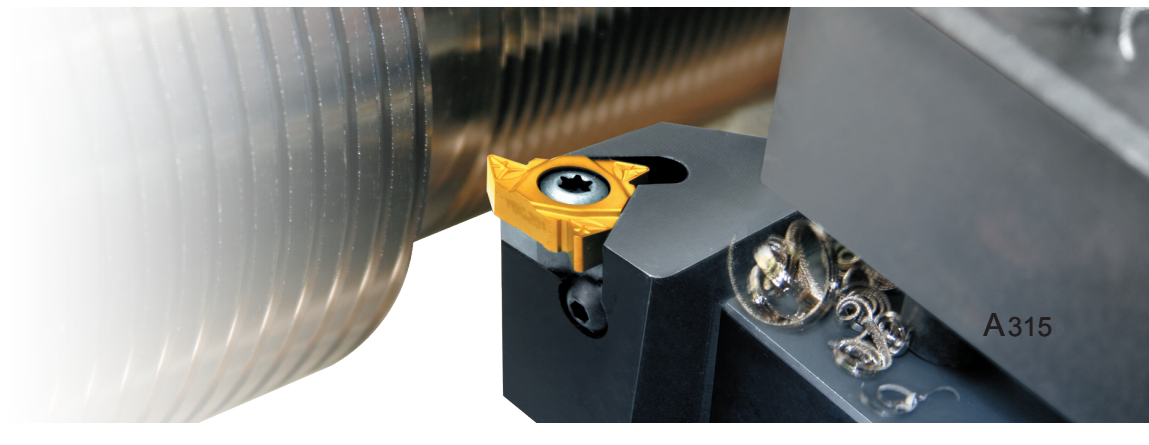
Zustellung unter einem Winkel von 3-5° zur Flanke des Gewindes, guter Spanablauf. Geeignet für langspanende Werkstoffe und Innengewinde.

Alternate flank infeed
Wechselseitige Zustellung



Alternating flank infeed is mainly used for large pitches and long chip materials. To get equal insert wear on both edges.

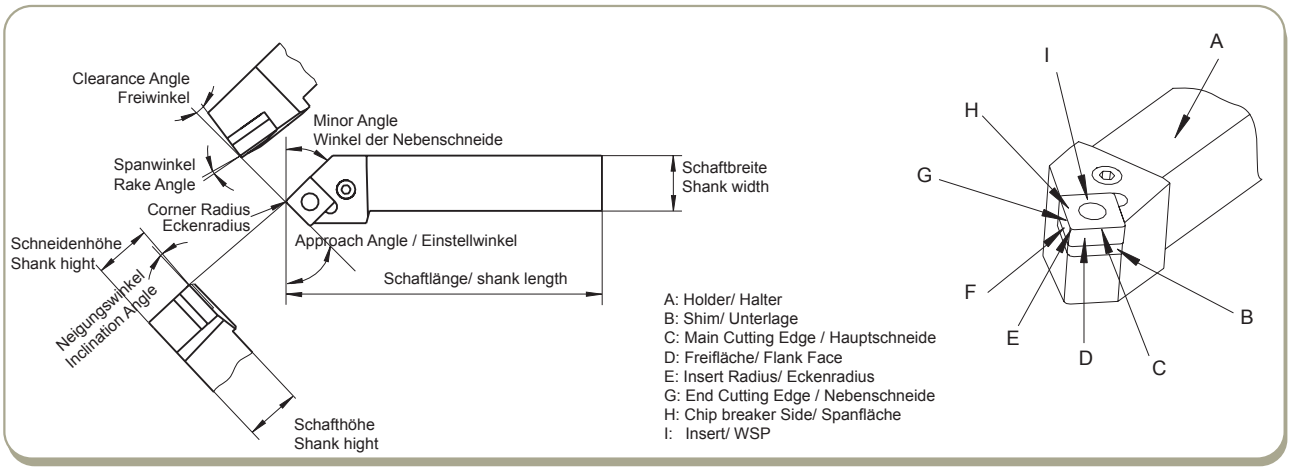
Wechselseitige Zustellung entlang beider Flanken. Anwendung bei großen Steigungen und langspanenden Werkstoffen. Gleichmäßiger Flankenverschleiß an beiden Schneidkanten.



Typical problem in threading and its solution
Typische Probleme bei der Gewindebearbeitung und Lösungsvorschläge

Problem / Problemstellung	Cause / Ursache	Solution / Lösung
Big flank wear Großer Freiflächenverschleiß	Cutting speed too high / Schnittgeschwindigkeit zu hoch	Reduce cutting speed / Schnittgeschwindigkeit verringern
	Infeed depth too small / Zustellung zu gering	Reduce number of infeeds /Anzahl der Zustellungen verringern
	Inserts is over centre line / Platte steht über Mitte	Adjust correct centre line / Plattenhöhe korrigieren
Asymmetric wear on left and right cutting edge Unterschiedliche Verschleißmarken an linker und rechter Seite	Incorrect method for flank infeed / Seitliche Zustellung nicht optimal	Change method of flank infeed / Seitliche Zustellung korrigieren
	Insert inclination angle does not correspont to the lead angle of the thread / Neigungswinkel und Hauptwinkel stehen nicht optimal zueinander	Change shim to obtain correct angle of inclination / Wechsel der Unterlage um korrekten Winkel zu erzeugen
Breakage / Bruch	Cutting speed too low / Schnittgeschwindigkeit zu niedrig	Increase cutting speed / Schnittgeschwindigkeit erhöhen
	Cutting force too big / Schnittkraft zu hoch	Increase number of infeeds. Reduce size of the largest infeeds / Anzahl der Zustellungen erhöhen, Zustellgröße verringern
	Unstable condition / Instabile Verhältnisse	Check and improve clamping and tool overhang to prevent vibration / Werkstückspannung und Auskraglänge verbessern, um Vibrationen zu verhindern
	Bad chip control	Increase pressure of cooling for better chip evacuation / Kühlmitteldruck erhöhen für bessere Spanabfuhr
Plastic deformation / Plastische Deformation	Cutting speed and temperature too high / Schnittgeschwindigkeit und Temperatur zu hoch	Decrease cutting speed / Schnittgeschwindigkeit verringern Increase number of infeeds. Reduce size of the largest infeeds / Anzahl der Zustellungen erhöhen, Zustellgröße verringern
	Insufficient cooling supply / Schlechte Kühlmittelzufuhr	Improve coolant supply / Kühlzufuhr verbessern
Thread surface quality is poor / Oberflächenqualität des Gewindes nicht gut	Cutting speed too low / Schnittgeschwindigkeit zu niedrig	Increase cutting speed / Schnittgeschwindigkeit erhöhen
	Inserts is over centre line / Platte steht über Mitte	Adjust correct centre line / Plattenhöhe korrigieren
	Bad chip control	Modified flank infeed / Zustellung verändern
Incorrect profile / Gewindeprofil nicht korrekt	Wrong centre height / Plattenhöhe nicht korrekt	Change centre height / Plattenhöhe verändern
	Toolholder not 90° to centre line / Halter steht nicht im 90° Winkel	Adjust tool holder / Halter neu ausrichten
	Pitch error in machine / Steigungsfehler der Maschine	Adjust machine / Maschine neu ausrichten
Shallow profile / Gewindeprofil	Wrong centre height / Plattenhöhe nicht korrekt	Change centre height / Plattenhöhe verändern
	Breakage of insert / Schneidkantenbruch	Change insert / Plattenwechsel
	Wear to big / Verschleiß zu groß	Change insert / Plattenwechsel
Build up edge / Aufbauschneidenbildung	Temperature on cutting edge too low / Temperatur an der Schneide zu gering	Increase cutting speed / Schnittgeschwindigkeit erhöhen
	Often occures in low carbon or stainless steel / Oft bei der Bearbeitung von Kohlensoffstahl oder rostfreiem Stahl	Choose grade with good toughness (PVD coated) / Sorte mit ausreichend Zähigkeit verwenden (PVD beschichtet)
Vibration / Vibrationen	Incorrect cutting parameter / Falsche Schnittparameter	Increase cutting speed or slow down cutting speed / Schnittgeschwindigkeit erhöhen oder stark verringern
	Wrong centre height / Plattenhöhe nicht korrekt	Change centre height / Plattenhöhe verändern
	Clamping of work piece not good / Werkstückspannung nicht ausreichend	Improve clamping system and minimize over hang / Spannsystem verbessern und Werkzeugauskragung minimieren

1. CUTTING TOOL GEOMETRIE · SCHNEIDENGEOMETRIE



2. RAKE ANGLE · SPANWINKEL

Rake angle is a cutting edge angle that has large effects on cutting resistance, chip disposal, cutting temperature and tool life. Increasing rake angle in positive direction improves sharpness of the cutting edge and the cutting force decreases but at the same time it lowers the strength. To increase the cutting resistance the rake angle must be increased in negative direction.

Eine Vergrößerung des Spanwinkels reduziert Schnittkräfte, weil der Span wenig aus seiner Fliessrichtung gelenkt wird. Hierdurch ist das Schneidensystem insgesamt schärfer und erzeugt dadurch eine geringere Schneidenbelastung, geringere Temperaturbelastung und insgesamt weniger Werkzeugverschleiß und somit eine hohe Zerspanungsleistung. Gleichzeitig bedeutet dies aber eine Schwächung des Schneidkeils, die Schneidenbelastung nimmt zu und die Gefahr von Schneidenausbrüchen steigt.

Selecting value	Auswahl	Specific machining situation	Anwendung
Small rake angle	Kleiner Spanwinkel	Machining of fragile and hard materials. Rough machining and interrupted cut	Bearbeitung von harten und spröden Werkstoffen Schruppbearbeitung und unterbrochener Schnitt
Big rake angle	Großer Spanwinkel	Machining of plastic materials and soft materials Precision machining	Bearbeitung von weichen und zähen Werkstoffen Präzisionsbearbeitung

3. RELIEF ANGLE · FREIWINKEL

Flank angle prevents friction between flank face and work piece resulting in smooth feed. Increasing flank angle decreases the cutting force and surface roughness becomes better but on the other hand this lowers the cutting edge strength and decrease the flank wear occurrence.

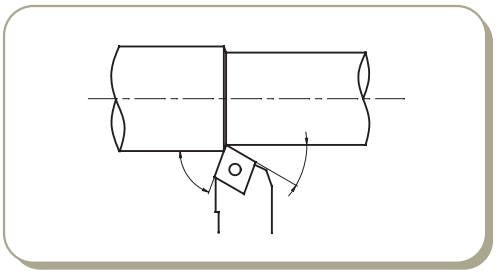
Eine Vergrößerung des Freiwinkels hat eine Verringerung der Reibung zwischen Werkstück und Werkzeug zur Folge. Die Schnittkräfte sind insgesamt geringer und es können bessere Oberflächengüten erreicht werden. Ein zu großer Freiwinkel schwächt allerdings die Schneidkantenstabilität. Je nach Anwendung liegen die Freiwinkel zwischen 3° und 12°.

Selecting value	Auswahl	Specific machining situation	Anwendung
Small flank angle	Kleiner Freiwinkel	Machining of hard and demure materials. For roughing operation with stable cutting edge	Bearbeitung von harten und spröden Werkstoffen Schruppbearbeitung mit stabiler Scheidkante
Big flank angle	Großer Freiwinkel	Precision machining with low cutting force Work pieces suffer from work hardening easily.	Für die Präzisionbearbeitung, mit geringen Schnittkräften. Material das schnell zu Gefügeveränderungen neigt

4. INCLINATION ANGLE · NEIGUNGSWINKEL

The positive and negative edge inclined angle decides the discharging direction of chips. In heavy cutting, the cutting edge receives extremely large shock at the beginning of cutting. Cutting edge inclination keeps the cutting edge from receiving this shock and prevents fracturing. On the other hand the back force increases and occurs vibration. A finishing operation a positive angle is more suitable.

Shown on page 305 Picture (1), when the edge inclined angle is negative, i.e. the cutting edge is located at the lowest point relative to the bottom plane of the tool holder, the chips flow to the machined surface of work piece. Shown on page 305 Picture (2), when the edge inclined angle is positive, i.e. the cutting edge is located at the highest point relative to the bottom plane of the tool holder, the chips flow to the un-machined surface of work piece.



Die positive oder negative Anstellung der Schneidkante hat maßgeblichen Einfluß auf die Fliessrichtung der Späne und die Belastung am Schneidpunkt.

Wie im Bild Seite 305 (1) dargestellt, bewirkt ein negativer Schneidkantenwinkel durch seinen zur Halteroberfläche niedrigeren Schneidpunkt einen Spanabfluß zur bereits bearbeiteten Werkstückoberfläche.

Wie im Bild Seite 305 (2) dargestellt bewirkt ein positiver Schneidkantenwinkel durch seinen zur Halteroberfläche höheren Schneidpunkt einen Spanabfluß zur unbearbeiteten Werkstückoberfläche.

Die Veränderung des Schneidkantenwinkels hat Einfluss auf die Stabilität der Schneide bzw. des Schneidenpunktes. Diese wird bei einem negativem Winkel erhöht und schützt somit das Werkzeug vor der Schlagbeanspruchung z.B. bei Schruppanwendungen oder Bearbeitungen mit unterbrochenem Schnitt.

Dabei wird aber auch die Gegenkraft erhöht, was zu Vibrationen führen kann.

Ein positiver Schneidkantenwinkel ist vorteilhaft bei der Schlichtbearbeitung, da die Späne von der bereits bearbeiteten Oberfläche weggeführt werden.

5. ENTERING ANGLE (APPROACH ANGLE) · EINSTELLWINKEL (HAUPTSCHNEIDE)

Reducing the lead angle increases the strength of the cutting edge. Heat dispersion is good and roughness of machining surface is small. Because lead angel is small, the cutting width is long, the force on the unit cutting edge length is small. At the same time, reducing the lead angle can increase the tool life.

Normally, when turn thin long shaft and ladder shaft, the lead angle adapts 90°. The lead angle is increased, radial force is reduced, cutting is stable, cutting thickness is increased and chip breaking performance is good.

Eine Reduzierung des Einstellwinkels erhöht die Stabilität der Schneide. Der Anteil der Schneide zur Spanbildung wird dabei vergrößert, die Belastung für die Schneide wird besser verteilt und die Wärme besser abgeführt. Ein kleiner Einstellwinkel wirkt sich positiv auf die Standzeit aus.

Ein großer Einstellwinkel von 90° wird bei der Bearbeitung von langen, dünnen Wellen benutzt, um eine Verbiegung des Werkstückes zu verhindern.

Selecting value	Auswahl	Specific machining situation	Anwendung
Small entering angle	kleiner Einstellw.	For material with high tensile strenght, high hardness or hardened layer on surface.	Für Materialien mit hoher Zugfestigkeit, hoher Härte oder gehärteter Oberfläche
Big entering angle	großer Einstellw.	For machine with low rigidity	Für Maschinen mit geringer Stabilität.

6. MINOR ANGLE · NEBENSCHEIDENWINKEL

The minor cutting edge angle is the main angle on influence surface roughness; its size is also influence strength of cutter. When the minor cutting edge angle is too small, the cutting force increases and results in chattering and vibration.
The selection principle for the minor cutting edge angle is, under the condition of rough machining, or un-influencing friction and producing vibration, the smaller angle should be chosen; the bigger angle can be used for precision machining.

Die Größe des Nebenschneidenwinkels beeinflusst die Oberflächengüte des Werkstücks und auch die Schneidkantenstabilität. Ist der Winkel zu klein können Vibrationen auftreten.
Ein kleiner Winkel sollte daher bei der Schruppbearbeitung angewendet werden, da die Schneide eine höhere Stabilität aufweist. Für die Präzisionsbearbeitung mit hohen Oberflächengüten sollte ein möglichst großer Winkel gewählt werden.

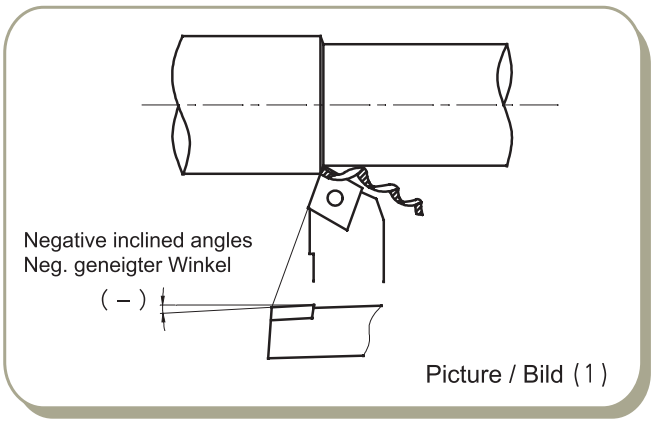
7. CORNER RADIUS · EINSTELLWINKEL

The corner radius effects the cutting edge strength and the finished surface.

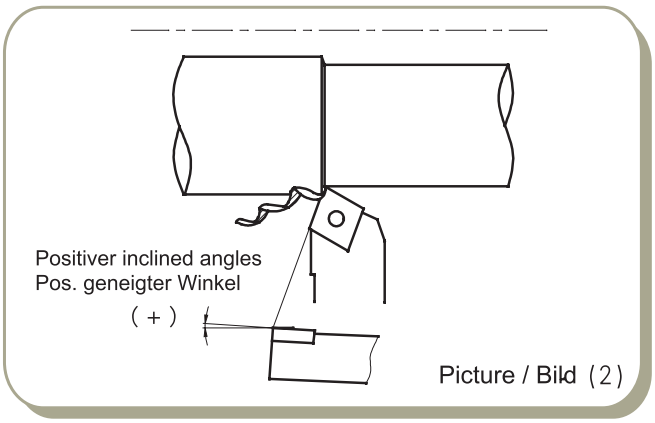
By increasing the corner radius the surface finish becomes better and the cutting edge strength improves. Flank and rake wear decreases. If the radius becomes to big cutting force increases and causes vibration. Also chip control becomes worth.

Die Größe des Nebenschneidenwinkels beeinflusst die Oberflächengüte des Werkstückes und auch die Schneidkantenstabilität. Ist der Winkel zu klein können Vibrationen auftreten. Ein kleiner Winkel sollte daher bei der Schruppbearbeitung angewendet werden, da die Schneide eine höhere Stabilität aufweist. Für die Präzisionsbearbeitung mit hohen Oberflächengüten sollte ein möglichst großer Winkel gewählt werden.

Selecting value	Auswahl	Specific machining situation	Anwendung
Small corner radius	Kleiner Radius	• Finishing with small cutting depth Machining thin long shafts • Rigidity of machine is insufficient	• Schlichtbearbeitung mit kleinen Schnitttiefen • Bearbeitung von langen, dünnen Wellen • Geringe Maschinenstabilität oder Spannung
Big corner radius	Großer Radius	• Rough machining, high cutting edge strength is required • Rigidity of machine is good • Machining harden materials and interrupted cut	• Schruppbearbeitung mit hoher Schneidkantenstabilität • Hoher Maschinenstabilität • Bearbeitung mit unterbrochenem Schnitt oder Schmiedehaut



Picture / Bild (1)



Picture / Bild (2)

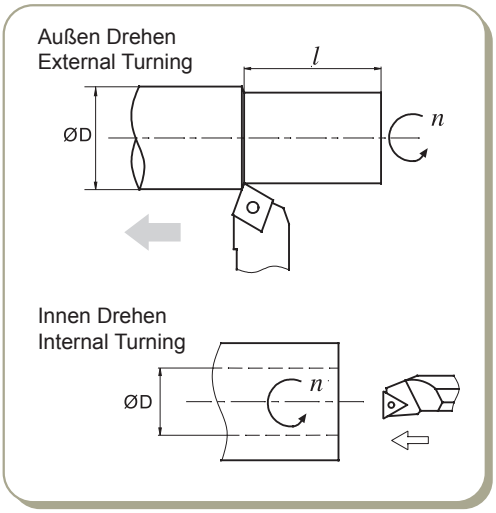
1. CUTTING SPEED · SCHNITTGESCHWINDIGKEIT

$$Vc = \frac{\pi \times D \times n}{1000} \ (m/min)$$

Vc: Cutting Speed/ Schnittgeschwindigkeit (m/min)
n: Revolution per min (rev/min)/ Drehzahl (U/min)
f: Feed per revolution (mm/rev)/ Vorschub pro Umdrehung (mm/U)

Example/Beispiel: n=250 U/min, f=0,2 mm/U, l=150mm

Result/Ergebnis: [hier dann die Formel Vc=...]



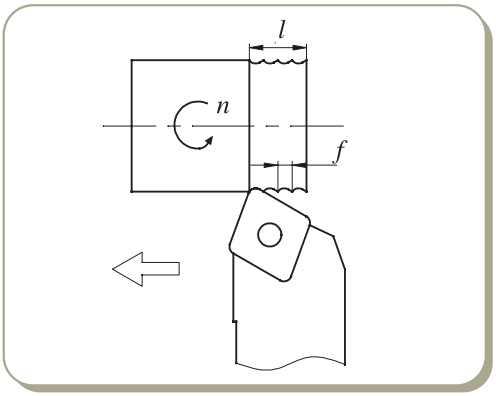
2. FEED RATE · VORSCHUBSGESCHWINDIGKEIT (F)

$$f = \frac{l}{n} \ (mm/rev)$$

f: Feed per Revolution/ Vorschub pro Umdrehung (mm/U)
l: Cutting length per Min/ Schnittlänge pro Minute (mm)
n: Revolution per min (rev/min)/Drehzahl (U/min)

Example/Beispiel: n=500 U/min, l=100 mm/min
Result/ Ergebnis: [hier dann die Formel f=.....]

$$f = \frac{l}{n} = \frac{100}{500} = 0.2(mm/rev)$$



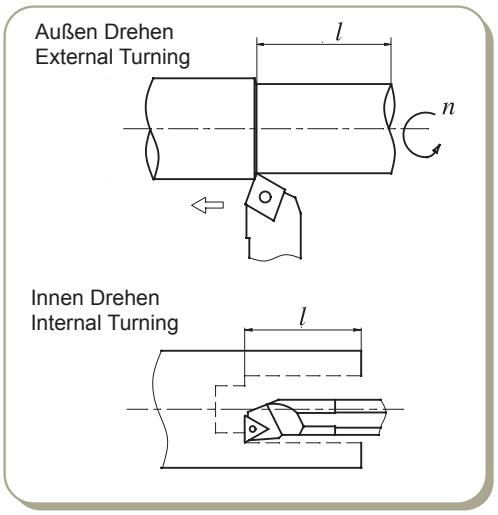
3. CUTTING TIME · SCHNITTZEIT

$$T_c = \frac{l}{f \times n} \ (min)$$

Tc: Cutting Time/ Schnittzeit (min)
l: Cutting length per Min/ Schnittlänge pro Minute (mm)
f: Feed per revolution (mm/rev)/ Vorschub pro Umdrehung (mm/U)
n: Revolution per min (rev/min)/ Drehzahl (U/min)

Example/Beispiel: n=250 U/min, f=0,2 mm/U, l=150mm

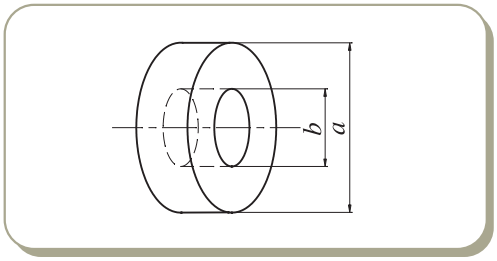
Result/Ergebnis: [hier dann die Formel Tc=...]



4. CUTTING TIME · SCHNITTZEIT FÜR PLANBEARBEITUNG

$$T_c = \frac{\pi \times (a^2 - b^2)}{4000 \times Vc \times f} \ (min)$$

Tc: Cutting Time/ Schnittzeit (min)
Vc: Cutting Speed/ Schnittgeschwindigkeit (m/min)
f: Feed per revolution (mm/rev)/
Vorschub pro Umdrehung (mm/U)

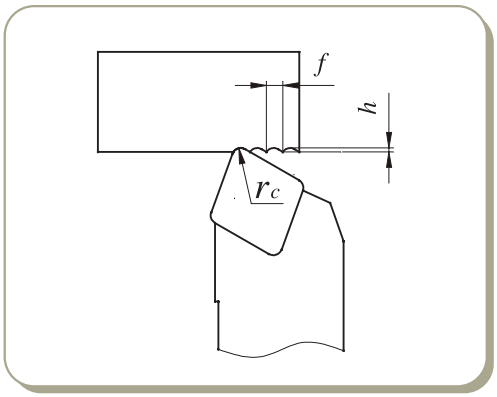


5. THEORETICAL SURFACE ROUGHNESS · THEORETISCHE OBERFLÄCHEN-RAUHIGKEIT (R)

$$R = \frac{f^2}{8 r_c} \times 1000 \ (\mu m)$$

R: Surface Roughness/Oberflächenrauhigkeit (µm)
f: Feed per revolution (mm/rev)/ Vorschub pro Umdrehung (mm/U)
rc: Insert Radius/ Radius des WSP (mm)

Example/Beispiel: f=0,2 mm/U, rc=0,4 mm

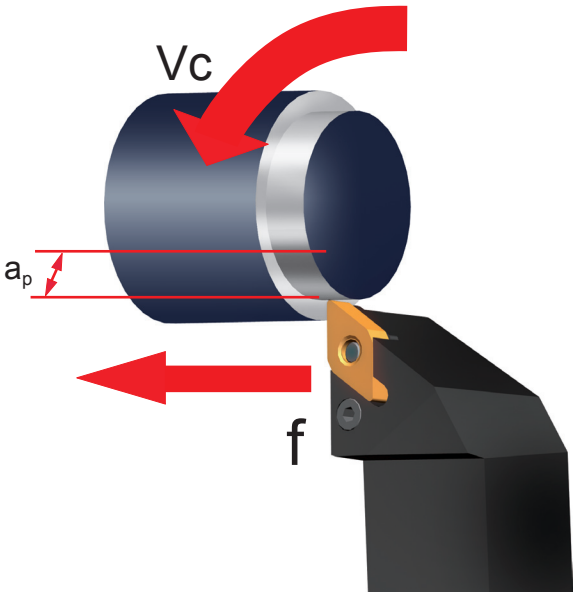


Three effects of cutting condition for turning
Einfluss der drei Schnittparameter beim Drehen

Three effects of cutting
Die drei Einflussgrößen

Today short machining time, long tool life and high machining accuracy is expected from modern tools. Based on the machine performance, material shape and hardness of the components the right choice of tool and cutting conditions are the premise for a successful machining process. Cutting speed, feed rate and depth of cut we call the "Three effects of cutting".

Die heutigen Anforderungen an moderne Zerspanungswerkzeuge sind in erster Linie kurze Bearbeitungszyklen, lange Werkzeugstandzeiten und hohe Bearbeitungsgenauigkeit.
In Abhängigkeit z.B. der Maschinenleistung, Material, Form und Härte des Werkstückes ist die Wahl der Werkzeuge und vor allem die richtigen Schnittparameter Voraussetzung für eine wirtschaftliche Zerspanung. Dieses nennen wir den „Einfluss der drei Schnittparameter beim Drehen"



Cutting speed · Schnittgeschwindigkeit (Vc)

Cutting speed is defined as the rate (or speed) that the material moves past the cutting edge of the tool. The unit for Vc is meter per minute [m/min].

Die Schnittgeschwindigkeit ist die Geschwindigkeit, mit der eine Werkzeugschneide in Schnittrichtung durch den zu bearbeitenden Werkstoff geführt wird und somit einen Span abnimmt. Die Einheit wird in Meter pro Minute [m/min] angegeben.

Cutting speed influence · Einfluss der Schnittgeschwindigkeit

Cutting speed is one of the three important effects of turning and has influence on tool life. Increasing the cutting speed also increases the cutting temperature and that decreases the tool life. Depending on the hardness and type of material the cutting speed varies. Therefore to choose a suitable grade for the cutting speed is necessary.
In general situation, when cutting speed is increased by 20% the tool life will be reduced ½; when the cutting speed is increased by 50% the tool life decreases 1/5
Lower cutting speed results in vibration which will shorten tool life.

Die Schnittgeschwindigkeit ist eine der wichtigsten Größen bei der Zerspanung, denn sie beeinflusst entscheidend die Fertigungszeit. Die Wahl der Schnittgeschwindigkeit hängt im Wesentlichen von der Zusammensetzung und Festigkeit des zu bearbeitenden Werkstoffes, der Zähigkeit und Härte des eingesetzten Schneidstoffes sowie

der gewünschten Maßgenauigkeit und Oberflächengüte ab. Sie beeinflusst aufgrund des parabolischen Anstiegs der Schneidentemperatur bei steigender Geschwindigkeit wesentlich den Verschleiß und somit die Standzeit des Werkzeuges. Die Schnittgeschwindigkeit ist daher so zu wählen, dass ein günstiges Verhältnis zwischen der Arbeits- und Schnittzeit und der für die Wiederinstandsetzung (Wechsel der Wendeschneidplatte) des Werkzeuges und Neueinrichten der Bearbeitungsmaschine erforderlichen Zeit entsteht.
Erhöhung Vc um 20% verringert die Standzeit auf die Hälfte; Erhöhung Vc um 50% beträgt die Standzeit nur noch ca. 1/5.
Geringes Vc führt zu Vibrationen und verkürzt die Standzeit.

Feed rate · Vorschub (f)

In turning application feed rate is the distance the tool holder moves per work piece revolution. That has influence to the surface quality. The unit for feed rate is millimetre per revolution [mm/rev]

Bei der Drehbearbeitung versteht man unter dem Vorschub den zurückgelegten Weg des Werkzeug(-halters) pro Umdrehung des Werkstückes und hat Einfluss auf die Oberflächengüte des Werkstückes. Die Einheit des Vorschubes ist Millimeter pro Umdrehung [mm/U]

Feed rate influence · Einfluss des Vorschubes

Decreasing the feed rate will increase flank wear and tool life will be shorten. Increasing feed rate increases the cutting temperature and also flank wear. On the other hand the efficiency will be improved.

Bei einer Reduzierung des Vorschubes steigt gleichzeitig der Freiflächenverschleiß an und die Standzeit des Werkzeuges wird herabgesetzt. Bei einer Erhöhung des Vorschubes steigt zwar die Wirtschaftlichkeit der Bearbeitung, allerdings auch die Schnitttemperatur und die Verschleißgröße.

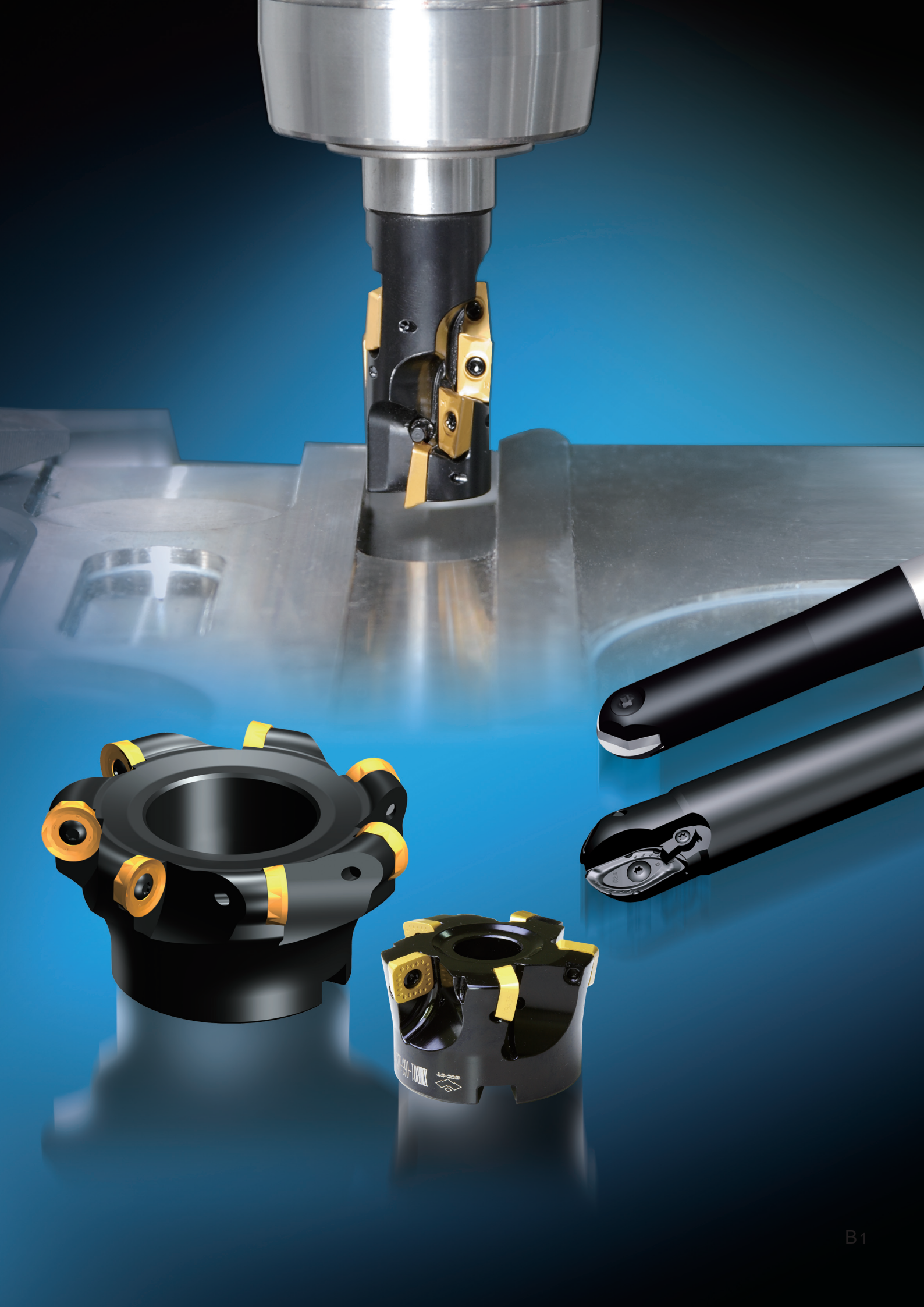
Depth of cut (doc) · Schnitttiefe (ap)

The depth of cut refers to the half different value between the diameter of the unmachined and machined work piece. The unit is millimeter [mm]
Die Schnitttiefe ist die halbe Differenz des Rohteildurchmessers zum gefertigten Durchmesser des Werkstückes. Die Einheit der Schnitttiefe ist Millimeter [mm].

Depth of cut influence · Einfluss der Schnitttiefe

Changing depth of cut has no big influence to the tool life. Machining hardened layer with small depth of cut results in friction and short tool life. Machining uncut surface or cast iron material, choose maximum depth of cut according to the machine power so that the cutting edge and corner radius is out of the hardened layer. That helps to prevent chipping and abnormal wear.

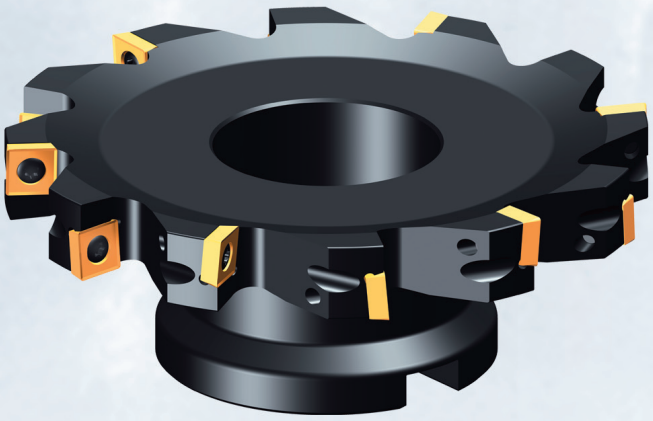
NOTIZEN:

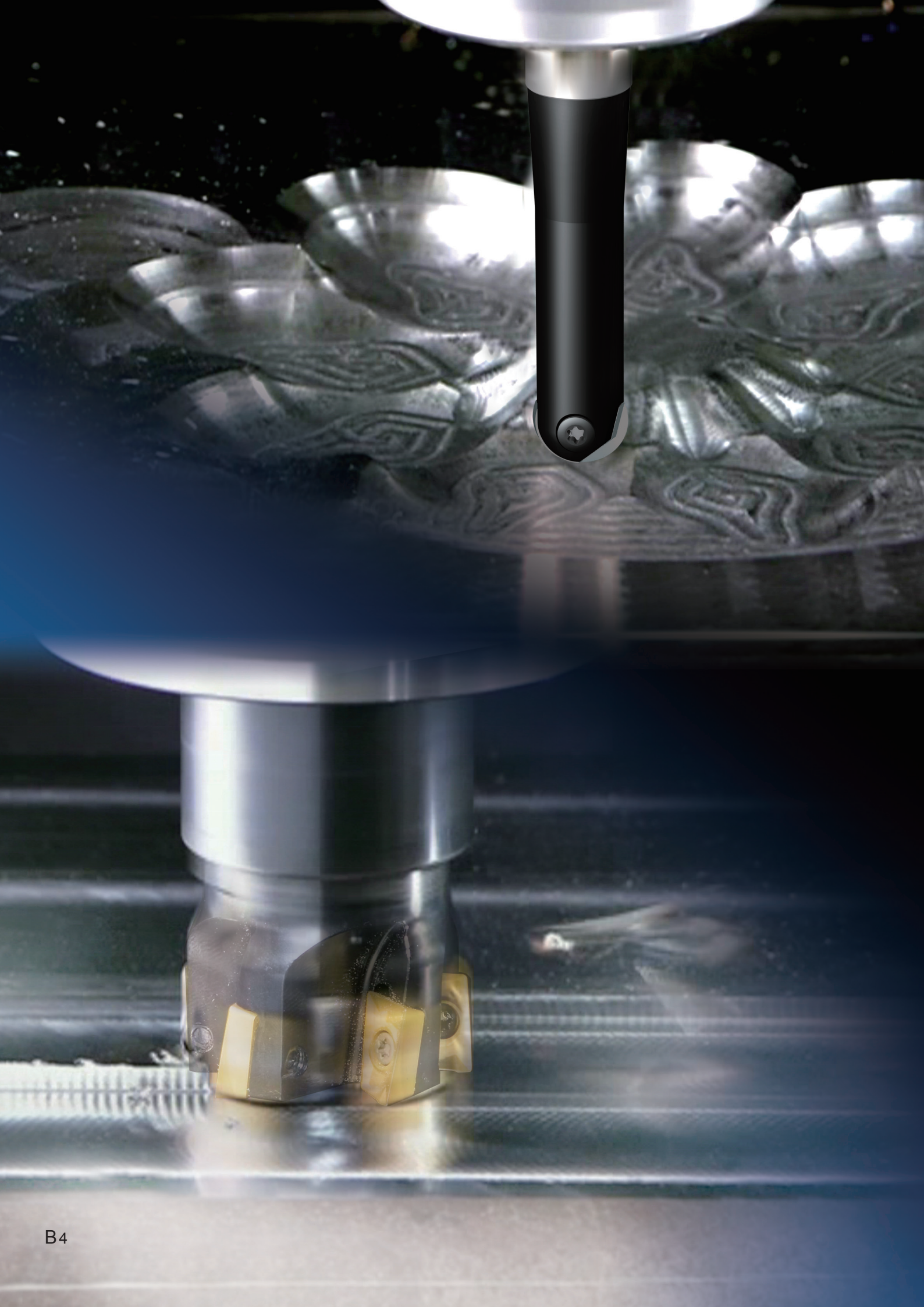



FMP02-050-A22-SE12-06
FMP02-125-140-SE12-06
1603.5×10 WTI5S

Milling · Fräsen

Indexable Milling Tools	**B1 - B187**	**Wendeschneidplatten Fräswerkzeuge**
Indexable milling tools	B2 - B150	Wendescheidplatten Fräswerkzeuge
Indexable milling inserts	B151 - B181	Fräswendescheidplatten
Technical information	B182 - B187	Technische Informationen
Solid Carbide End Mills	**B188-B374**	**Vollhartmetall Schaftfräser**
Solid carbide end mills	B188-B292	Vollhartmetall Schaftfräser
Technical information	B293-B374	Technische Information



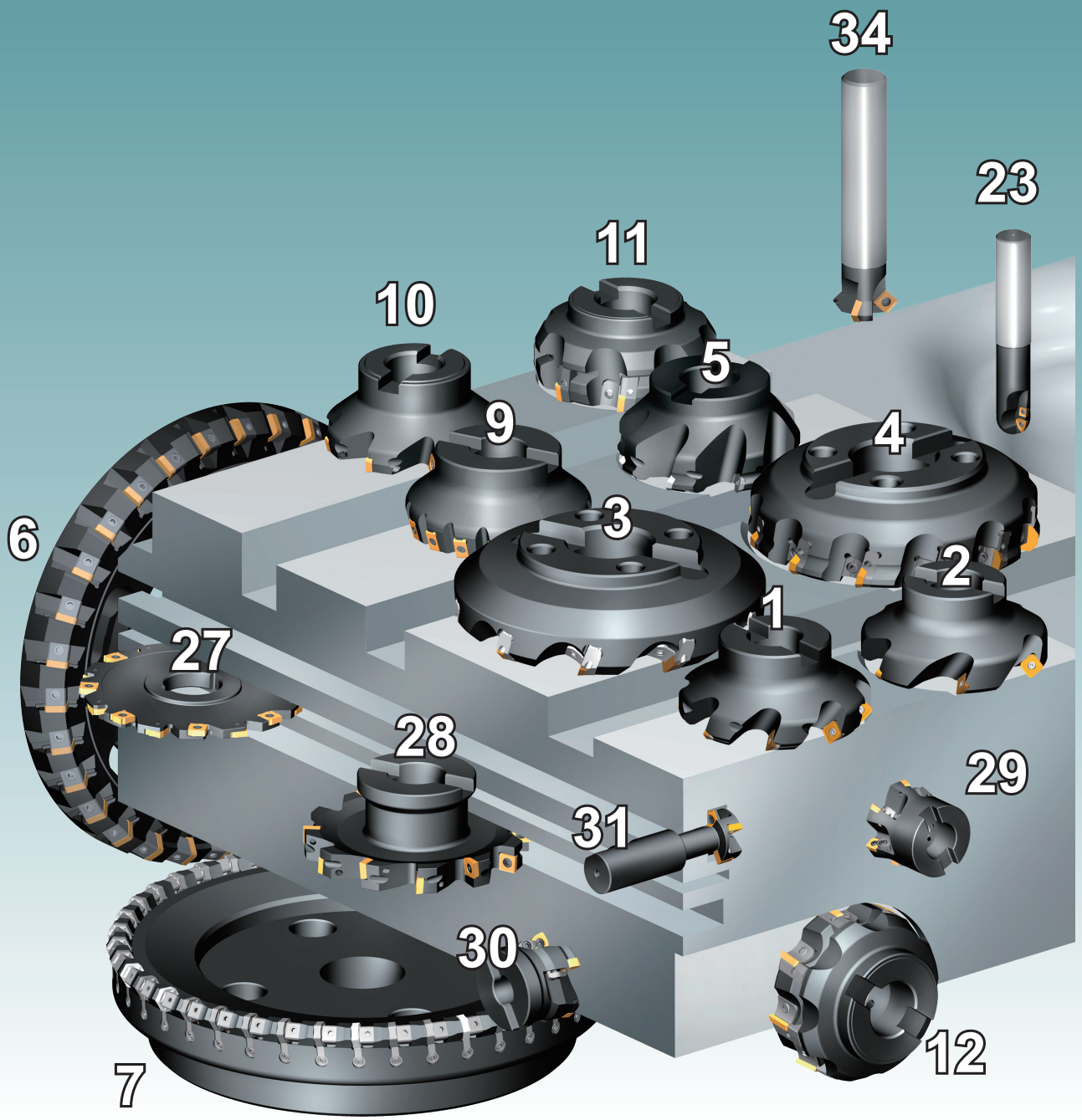


Milling · Fräsen

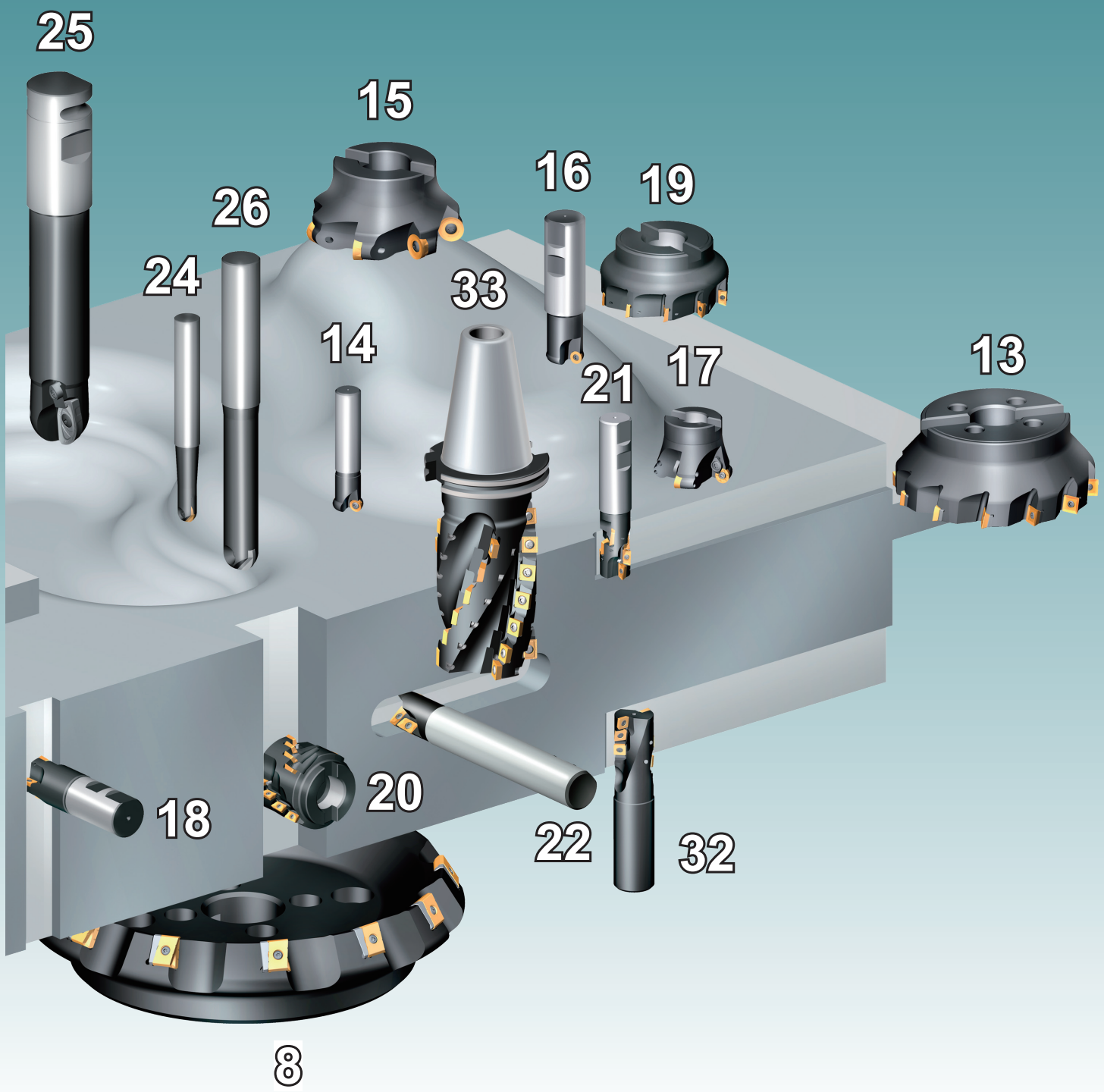
Indexable Milling Tools · Wendeplattenfräser

B6-B7	**Indexable milling tool family** **Wendeplattenfräsprogramm**
B9-B15	**Indexable milling tools overview** **Wendeplattenfräser Übersicht**
B17	**Milling insert grades overview** **Fräswendeplatten Sorten Übersicht**
B18-B23	**Grade classification for milling inserts** **Sortenbezeichnung für Fräswendeplatten**
B24-B25	**Indexable milling tools code key** **Wendeplattenfräswerkzeuge ISO Kennzeichen**
B26-B150	**Indexable milling tool** **Wendeplattenfräser**
B26-B82	Face milling Planfräsen
B83-B99	Square shoulder milling Eckfräsen
B100-B123	Profile milling Profilfräsen
B124-B131	Side and face milling Eck- und Planfräsen
B132-B139	Special milling (high feed) Spezial Hochvorschubfräsen
B140-B141	T-slot milling T-Nuten Fräsen
B142-B146	Helical end mills Spiral Schaftfräsen
B147-B150	Chamfer milling Fasfräsen
B151-B152	**Indexable milling inserts overview** **Fräswendeplatten Übersicht**
B153-B154	**Indexable milling inserts code key** **Fräswendeplatten ISO Kennzeichen**
B155-B181	**Milling inserts Specification** **Fräswendeplatten Spezifikation**
B182-B188	**Technical information** **Technische Information**

Indexable milling tool Program
Wendeplatten Fräsprogramm



No. Nr.	Tool category Werkzeug Kategorie	Page Seite	No. Nr.	Tool category Werkzeug Kategorie	Page Seite	No. Nr.	Tool category Werkzeug Kategorie	Page Seite
1	FMA01	B26	7	FMD02	B43-46	13	FMP02/03	B62/68
2	FMA02	B27	8	FMD03	B47-49	14	FMR01	B70
3	FMA03	B31	9	FME01	B50	15	FMR02	B73
4	FMA04 (OFKR07**)	B34	10	FME02	B52	16	FMR03	B75
5	FMA04 (OFKT05**)	B38	11	FME03/04	B53/54	17	FMR04	B78
6	FMA05	B41	12	FMP01	B60	18	EMP01	B83



No. Nr.	Tool category Werkzeug Kategorie	Page Seite	No. Nr.	Tool category Werkzeug Kategorie	Page Seite	No. Nr.	Tool category Werkzeug Kategorie	Page Seite
19	EMP02	B90	25	BMR03	B105-116	31	TMP01	B140
20	EMP03	B93	26	BMR04	B117-123	32	HMP01(Ø40-Ø50)	B141
21	EMP04	B94	27	SMP01	B124-128	33	HMP01(Ø50-Ø80)	B142-143
22	EMP05	B98	28	SMP03	B129-131		HMP01 EC(Ø50-Ø80)	B144
23	BMR01	B100	29	XMR01(SDMT**)	B132-134	34	CM*01	B147-150
24	BMR02	B103	30	XMR01(WPGT**)	B135-139			


R15

Face milling · Planfräsen

Serie	Approach Angle / max. depth of cut Einstellwinkel/ max. Schnitttiefe	Insert WSP	Application Anwendung	Features Merkmale
FMA01  B26	Kr=45° a_{pmax}=6.0	SEET12T3-DF/DM/DR SEET12T3-CF/CM/CR SEET12T3-EF/EM SEET12T3-LH SEET12T3-W	General face milling of: Steel, alloy steel, stainless steel, cast iron, aluminium alloy, high temperature alloy Allgemeines Planfräsen von: Stahl, leg. Stahl, rostfr. Stahl, Grauguss, Alu.-legierungen, hochtemperaturbeständige Legierungen	• Diameter range Ø50-Ø315 • Large rake angle makes cutting more light and fast • Wide applications by using available inserts with different chipbreaker • Adopting wiper inserts improve surface quality • Durchmesserbereich: 50 – 315 mm weichschneidende Fräser mit großer, positiver Schneidengeometrie. • Großes Anwendungsgebiet durch unterschiedliche Spanbrecherausführung • Wiper-Wendeschneidplatten für beste Oberflächenqualität
FMA02  B27	Kr=45° a_{pmax} =6.0	SEET12T3-DF/DM/DR SEET12T3-CF/CM/CR SEET12T3-EF/EM SEET12T3-LH SEET12T3-W	General face milling of: Steel, alloy steel, stainless steel, cast iron, aluminum alloy, high temperature alloy Allgemeines Planfräsen von: Stahl, leg. Stahl, rostfr. Stahl, Grauguss, Alu.-legierungen, hochtemperaturbeständige Legierungen	• Diameter range Ø50-Ø125 • Large rake angle makes cutting more light and fast • Wide applications by using available inserts with different chipbreaker • Coarse and differential pitch, reduce vibration. • Durchmesserbereich: 50 – 125 mm weichschneidende Fräser mit großer, positiver Schneidengeometrie. • Großes Anwendungsgebiet durch unterschiedliche Spanbrecherausführung • Weite und Differential Teilung zur Vermeidung von Vibrationen
FMA03  B31	Kr=45° a_{pmax}=5.5	SE**N1203AF** SE**R1203AF**	General face milling of steel, stainless steel, cast iron Allgemeine Planfräsbear. von Stahl, rostfr. Stahl und Grauguss	• Diameter range Ø80-Ø315 • Large rake angle makes cutting more light and fast • Top clamping reduces vibrations • Durchmesserbereich: 80 – 315 mm weichschneidende Fräser mit großer, positiver Schneidengeometrie. • Großes Anwendungsgebiet durch unterschiedliche Spanbrecherausführung stabile • Top Klemmung zur Vermeidung von Vibrationen
	Kr=45° a_{pmax}=7.5	SE**N1504AF** SE**R1504AF**		
FMA04  B34	Kr=45° a_{pmax}=3.5	OFKT05T3-DF/DM OFKT05T3-LH	Face milling of steel, alloy steel, cast iron, aluminum alloy Planfräsen von Stahl, leg. Stahl und Grauguss	• Diameter range Ø50-Ø160 • High economy milling tool with 8 cutting edges • Screw clamping, high precision • Durchmesserbereich: 125 – 315 mm • Hochwirtschaftlicher Fräser mit 8 Schneidkanten/ Wendeschneidplatten • Schraubenklemmung mit hoher Präzision. • Top Klemmung zum leichteren Plattenwechsel
 B38	Kr=45° a_{pmax} =5.0	OFKR0704-DF/DM	Face milling of steel, alloy steel and cast iron Planfräsen von Stahl, leg. Stahl und Grauguss	• Diameter range Ø125-Ø315 • High economy milling tool with 8 cutting edges • Top clamping is easy to assemble and disassemble • Durchmesserbereich: 125 – 315 mm • Hochwirtschaftlicher Fräser mit 8 Schneidkanten/ Wendeschneidplatten • Schraubenklemmung mit hoher Präzision. Top Klemmung zum leichteren Plattenwechsel
FMA05  B41	Kr=45° a_{pmax}=5.0	SNKN1204ENN	Face milling cast iron Planfräsen von Grauguss	• Diameter range Ø200-Ø450 • Extra close pitch milling tool, rapid feed rate • Double negative rake angle, high cutting edge strength • High economy milling tool with 8 cutting edges • Durchmesserbereich: 200 – 450 mm • Extra enge Teilung für hohe Vorschübe. Doppelt neg. Winkel für hohe Schneidkanten-Stabilität • Hochwirtschaftlicher Fräser mit 8 Schneidkanten/ Wendeschneidplatten • Schraubenklemmung mit hoher Präzision Hochwirtschaftlicher Fräser mit 8 Schneidkanten/ Wendeschneidplatten
	Kr=45° a_{pmax}=5.5	SNKN1504ENN		

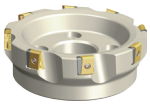
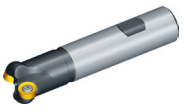
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Milling Tools · Fräser

Face milling · Planfräser

Serie	Approach Angle / max. depth of cut Einstellwinkel/ max. Schnitttiefe	Insert WSP	Application Anwendung	Features
FMD02  B43	Kr=58° a_{pmax}=4.0	HNEX090512-DF/DM HNEX090512-DR HNEX090516-DR	Face milling of cast iron Planfräsen von Grauguss	• Diameter range Ø80-Ø315 • New milling tool generation for higher feed rate • High economy milling tool with 12 cutting edges • Top clamping is easy to assemble and disassemble • Durchmesserbereich: 80 – 315 mm • Neue Fräsgeneration für hohe Vorschübe • Hochwirtschaftliche Fräser mit 12 Schneidkanten/ Wendeschneidplatten
FMD02  B45	Kr=67° a_{pmax}=3.5	PNEG110512R-CF PNEG110512R-CR	Face milling of cast iron Planfräsen von Grauguss	• Diameter range Ø50-Ø160 • Cutting edges for low cutting force • With wiper for good surface quality • High economy milling toolwith 10 cutting edges • Durchmesserbereich: 50 – 160 mm • Spezielle Schneidkante für niedrige Schnittkräfte • Mit Wiper-Fase für gute Oberflächengüten • Hoch wirtschaftlich durch doppelseite 10 Schneiden Platte
FMD03  B47	Kr=60° a_{pmax}=12.0	LNKT2007DN-ZR	Heavy-duty face milling of steel, alloy steel and cast iron Schwerzer-spanungsfräsen von Stahl, leg. Stahl und Grauguss	• Diameter rang Ø125-Ø400 • Double positive rake angle reduces the cutting force • Suitable for heavy machining with big cutting depth • Easy to assemble and clamp inserts • Durchmesserbereich: 125 – 400 mm • Doppelt positive Schneidwinkel zur Reduzierung der Schnittkräfte • Anwendung zur Schwerzerspanung bei hohen Schnitttiefen • Einfache und stabile Wendeschneidplatten-Klemmung
	Kr=60° a_{pmax}=17.0	LNKT2510-ZR		
FME01  B50	Kr=75° a_{pmax}=8.0	LNE32.534	Face milling of cast iron Planfräsen von Grauguss	• Diameter range Ø125-Ø315 • Close pitch milling tools • Suitable for face milling of cast iron parts on large-power machines. • Durchmesserbereich: 125 – 315 mm • Enge Teilung • Einsatz: zum Planfräsen von Grauguss Werkstücken auf stabilen Maschinen
FME02  B52	Kr=75° a_{pmax}=6.0	SPKW1204EDFR SPKW1204EDSR SPKT1204EDR	Face milling of steel, alloy of steel and cast iron Planfräsen von Stahl, leg. Stahl und Grauguss	• Diameter range Ø50-Ø125 • Kr 75°, general face milling • Wide applications by using inserts with different chipbreakers • Durchmesserbereich: 50 – 125 mm • Anstellwinkel 75 Grad, • allgemeines Planfräsen • weites Anwendungsgebiet durch Einsatz von Wendeschneidplatten mit unterschiedlichen Spanbrechern
FME03  B54	Kr=75° a_{pmax}=6.0	SP*N1203(1504)ED** SP*R1203(1504)ED**	General face milling of steel, alloy steel and cast iron Allgemeines Planfräsen von Stahl, leg. Stahl und Grauguss	• Diameter range Ø80-Ø315 • Kr 75°, general face milling • Top clamping is easy to assemble and disassemble • Durchmesserbereich: 80 – 315 mm • Einstellwinkel 75 Grad zum allgemeinen Planfräsen • Top Klemmsystem zum einfachen Wendeschneidplattenwechsel.
	Kr=75° a_{pmax}=8.0	SP*N1504ED** SP*R1504ED**		
FME04  B58	Kr=75° a_{pmax}=8.0	LNKT1506EN-ZR	Heavy-duty face milling of steel and alloy steel Schwerzer-spanungsfräsen von Stahl und leg. Stahl	• Diameter rang Ø125-Ø315 • Kr 75°, heavy face milling • with 4 cutting edges • Durchmesserbereich: 125 – 315 mm • Kr 75°, Planfräsen mit hohen Abtragraten • 4 Schneidkanten

Face milling · Planfräsen

Serie	Approach Angle / max. depth of cut Einstellwinkel/ max. Schnitttiefe	Insert WSP	Application Anwendung	Features Merkmale
FMP01  B60	Kr=90° a_{pmax}=18.0	TP*N2204PD* TPKN2204PDF* TPKN2204PDT*	Face milling of steel, alloy steel and cast iron Planfräsen von Stahl, leg. Stahl und Grauguss	• Diameter range Ø80-Ø315 • Kr 90° , square shoulder milling • Top clamping is easy to assemble and disassemble • Durchmesserbereich: 80 – 315 mm • Einstellwinkel 90 Grad Grad zum allgemeinen Planfräser • Top Klemmsystem zum einfachen Wendeschneidplattenwechsel.
FMP02  B62	Kr=90° a_{pmax}=6.7	SEET09T308PER-PF/PM SEET09T308PER-PR	Face milling steel, alloy steel, stainless steel and cast iron Plan- und Eckfräsen von Stahl, leg. Stahl, rostfr. Stahl und Grauguss	• Diameter range Ø50-Ø315 • Kr 90°, for square shoulder milling and face milling • Different pitch design: coarse pitch, close pitch and extra close pitch • High precision insert for, high surface quality • Optimized chipbreaker and grade, for finish machining, semi-finish machining and rough machining. • Durchmesserbereich: 50 – 315 mm • Einstellwinkel 90 Grad zum Eck- und Planfräsen • Unterschiedliche Teilung: weit, eng und extra eng • Präzisionsschneidplatten zur Erzielung hoher Oberflächenqualität • Optimale Spanbrecher und Hartmetallsorten zum Schlichten, mittlere Bearbeitung und Schruppen.
	Kr=90° a_{pmax}=10.8	SEET120308PER-PF/PM SEET120308PER-PR		
FMP03  B68	Kr=90° a_{pmax}=8	LNKT1506EN-ZR	Heavy Duty face milling steel, alloy steel, stainless steel and cast iron Schwerzerspanung von Stahl, leg. Stahl, rostfr. Stahl und Grauguss	• Diameter range Ø125-Ø315 • Kr 90°, for square shoulder milling and face milling with big cutting depth • positive rake reduces the cutting force • Durchmesserbereich: 125 – 315 mm • Einstellwinkel 90 Grad zum Schulter- und Planfräsen mit großer Schnitttiefe • Positiver Spanwinkel für weniger Schnittkräfte
	a_{pmax}=12	LNKT2007DN-ZR		
	a_{pmax}=15	LNKT2510-ZR		
FMR01  B70	a_{pmax}=5.0	RCKT10T3MO-DM	Cavity profile milling of steel, alloy steel, stainless steel and cast iron Formfräsen von Stahl, leg. Stahl, rostfr. Stahl und Grauguss	• Diameter range Ø25-Ø50 • R-type inserts possess stronger cutting edges • Suitable for machining curved surface of mould • Economical milling cutters with screw clamping • Durchmesserbereich: 25 – 50 mm • Radiusfräser mit stabiler Schneidkante • Einsatz zur Bearbeitung von Formen und • Gesenken • Wirtschaftliche Fräser mit Schraubenklemmung
	a_{pmax}=6.0	RCKT1204MO-DM/DR		
FMR02  B73	a_{pmax}=6.0	RCKT1204MO-DM/DR	Face milling and cavity profile milling of steel, alloy steel, stainless steel and cast iron Plan- und Formfräsen von Stahl, leg. Stahl, rostfreier Stahl und Grauguss	• Diameter range Ø63-Ø200 • R-type inserts possess stronger cutting edges • Suitable for machining curved surface of mould • Economical milling tools with screw clamping • Durchmesserbereich: 63 – 200 mm • Radiusfräser mit stabiler Schneidkante • Einsatz zur Bearbeitung von Formen und Gesenken • Wirtschaftliche Fräser mit Schraubenklemmung
	a_{pmax}=8.0	RCKT1606MO-DM/DR		
	a_{pmax}=10.0	RCKT2006MO-DR		
FMR03  B75	a_{pmax}=3.5	RDKW0702MO	Cavity profile milling of steel, alloy steel, stainless steel and cast iron Formfräsen von Stahl, leg. Stahl, rostfreier Stahl und Grauguss	• Diameter range Ø25-Ø50 • R-type inserts possess stronger cutting edges • Suitable for machining curved surface of mould • Economical milling tools with screw clamping • Durchmesserbereich: 25 – 50 mm Radiusfräser mit stabiler Schneidkante • Einsatz zur Bearbeitung von Formen und Gesenken • Wirtschaftliche Fräser mit Schraubenklemmung
	a_{pmax}=4.0	RDKW0803MO		
	a_{pmax}=5.0	RDKW1003MO RDKW10T3MO		
	a_{pmax}=6.0	RDKW12T3MO RDKW1204MO		

	Serie	Approach Angle / max. depth of cut Einstellwinkel/ max. Schnitttiefe	Insert WSP	Application Anwendung	Features Merkmale
Face milling Planfräsen	**FMR04**  B78	a_{pmax}=6.0	RDKW1204MO RDKW12T3MO	Face milling and cavity profile milling of steel, alloy steel, stainless steel and cast iron Plan- und Formfräsen von Stahl, leg. Stahl, rostfreier Stahl und Grauguss	• Diameter range Ø50-Ø160 • R-type inserts possess stronger cutting edge • Suitable for machining curved surface of mould • Durchmesserbereich: 50 – 160 mm • Radiusfräser mit stabiler Schneidkante • Einsatz zur Bearbeitung von Formen und Gesenken • Wirtschaftliche Fräser mit Schraubenklemmung
		a_{pmax}=8.0	RDKW1605MO RDKW1604MO		
		a_{pmax}=10.0	RDKW2006MO		
Square shoulder milling · Eckfräsen	**EMP01**  B83	Kr=90° a_{pmax}=10.5	APKT11T3**-PF/PM/ PR APKT11T3**-LH	Multi-function milling of steel, alloy steel, stainless steel, cast iron and Al alloy Universelles Fräsen von Stahl, leg. Stahl, rostfr. Stahl, Grauguss und leg. Alu	• Two mounting modes: Straight shank and Weldon shank, Diameter range Ø12-Ø63 • Kr 90° , for square shoulder milling, slot milling, ramp milling etc. • Wiper inserts also suitable for face milling. • Inserts with 3D helical cutting edge, less cutting force • Zwei Aufnahmeversionen: Zylinderschaft u. Weldon • Durchmesserbereich: 12 – 63 mm • Einstellwinkel 90 Grad, zum Eck, Nuten, Tauchfräsen etc. • Wiper-Schneidplatten zum Planfräsen • Schneidplatte mit 3-D spiral Schneide zur Reduzierung der Zerspanungskräfte
		Kr=90° a_{pmax}=15.5	APKT160408- PF/PM/ PR APKT160408-LH		
	EMP02  B90	Kr=90° a_{pmax}=10.5	APKT11T3**- PF/PM/ PR APKT11T3**-LH	Face milling of steel, alloy steel, stainless steel, cast iron and Al alloy Universelles Fräsen von Stahl, leg. Stahl, rostfr. Stahl, Grauguss und leg. Alu	• Diameter range Ø50-Ø100 • Kr 90° , for square shoulder milling • Wiper inserts also suitable for face milling. • Inserts with 3D helical cutting edge, less cutting force • Durchmesserbereich: 50 – 100 mm • Einstellwinkel 90 Grad zum Eckfräsen • Wiper-Schneidplatten zum Planfräsen Schneidplatte im 3-D Design • Zirkularschneide zur Reduzierung der Zerspanungskräfte
		Kr=90° a_{pmax}=15.5	APKT160408- PF/PM/ PR APKT160408-LH		
	EMP03  B93	Kr=90° a_{pmax}=39.0	APKT11T3**-PF/PM/ PR APKT11T3**-LH	Adopting large cutting depth, for milling of steel, alloy steel, stainless steel, cast iron and Al alloy Fräsen mit großen Schnitttiefen von Stahl, leg. Stahl, rostfr. Stahl, Grauguss und leg. Alu	• Diameter range Ø50-Ø100 • End milling tools with positive helical angle, good chip removal • For side face milling and slot machining • Close pitch, high machining efficiency. • Durchmesserbereich: 50 – 100 mm • Eckfräser mit pos. Zirkularwinkel und guter Spanabfuhr. • Eck- und Nutenfräsen • Enge Teilung zur Erreichung hoher Bearbeitungswirtschaftlichkeit.
	EMP04  B94	Kr=90° a_{pmax}=58.0	APKT11T3**-PF/PM/ PR APKT11T3**-LH	Adopting large cutting depth, for milling steel, alloy steel, stainless steel, cast iron and Al alloy Fräsen mit großen Schnitttiefen von Stahl, leg. Stahl, rostfr. Stahl, Grauguss und leg. Alu	• Diameter range Ø20-Ø40 • End milling tools with positive helical angle, good chip removal • For side face milling and slot machining • Close pitch, high machining efficiency. • Durchmesserbereich: 20 – 40 mm • Schaftfräser mit pos. Zirkularwinkel und guter Spanabfuhr • Eck- und Nutenfräsen • Enge Teilung zur Erreichung hoher Bearbeitungswirtschaftlichkeit.

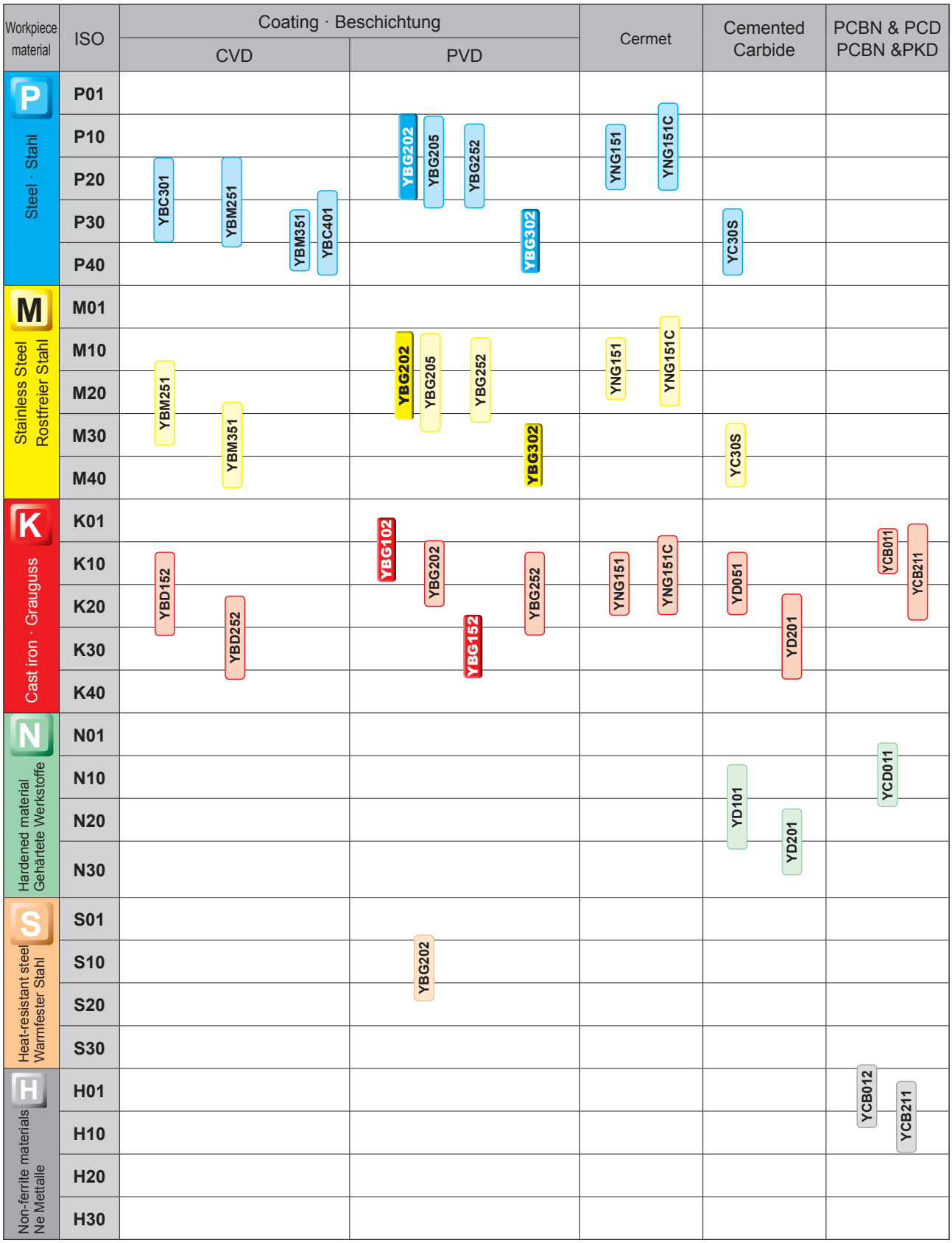
	Serie	Approach Angle / max. depth of cut Einstellwinkel/ max. Schnitttiefe	Insert WSP	Application Anwendung	Features Merkmale
Square shoulder milling Eckfräsen	**EMP05**  B98	Kr=90° a_{pmax}=40.0	APMT1135PDR APMT160408PDER	Multi-function drilling and milling steel alloy steel, stainless steel and cast iron Multi-Funktionsbohren und Fräsen von Stahl, leg. Stahl, rostfr. Stahl und Grauguss	• Diameter range Ø25-Ø40 • End edge over center, for drilling directly • Durchmesserbereich: 25 – 40 mm • Zentrum-Schneide (über Mitte) zum Bohren.
Profile milling · Formfräsen	**BMR01**  B100	Cutting depth: see the detailed information about tool specifications Schnitttiefe: siehe detailierte info: in der Werkzeug spezifikation.	ZDET**CYR** ZPNT2204CYR** SPMT060304 SDMT**	Profile machining of steel, stainless steel and cast iron Formfräsen von Stahl, rostfreiem Stahl und Grauguss.	• Diameter range Ø20-Ø63 • Very suitable for rough machining large mold • Ball nose cutter with 3-cutting-edges inserts, perfect economical efficiency • Durchmesserbereich: 20 – 63 mm • Besonders geeignet für die Schruppbearbeitung von großen Formen • Radiusfräser mit 3 Schneidkanten pro Schneidplatte. • Hohe Wirtschaftlichkeit
	BMR02  B103		ROHX**	Profile machining of steel, stainless steel and cast iron Formfräsen von Stahl, rostfreiem Stahl und Grauguss.	• Diameter range Ø12-Ø20 • Applied for profile finish machining • Good assembly stability. • Insert with two cutting edges, perfect economical efficiency. • Durchmesserbereich: 12 – 20 mm • Schlichtbearbeitung von Formen • Hohe Fräserstabilität • Schneidplatte mit 2 Schneidkanten • Hohe Wirtschaftlichkeit
	BMR03  B105  B106  B107  B108		XPHT**R**- GM	Profile machining of steel, stainless steel and cast iron Formfräsen von Stahl, rostfreiem Stahl und Grauguss.	• Diameter range Ø16-Ø50 • Very suitable for rough machining moulds • Equipped with 3D chipbreaker inserts, high circular edge precision. • Tool body with high rigidity • Durchmesserbereich: 16 – 50 mm • Besonders geeignet für das Schruppfräsen von Formen. • 3-D Spanbrecher für hohe Rundlaufgenauigkeit • Werkzeugkörper mit hoher Stabilität

	Serie	Approach Angle / max. depth of cut Einstellwinkel/ max. Schnitttiefe	Insert WSP	Application Anwendung	Features Merkmale
Profile milling Formfräsen	**BMR04**  B117  B118		ZOHX**	Profile machining of steel, stainless steel and cast iron Formfräsen von Stahl, rostfreiem Stahl und Grauguss.	• Diameter range Ø10-Ø40 • High precision, for finish profile machining. • Two types of chipbreaker, used at different machining condition • High assembling precision, good stability. • Durchmesserbereich: 10 – 40 mm • Hohe Präzision zur Fertigbearbeitung beim Formfräsen. • 2 Spanbrechergeometrien für unterschiedliche Anwendungen • Hohe Fräserstabilität und Präzision.
Slot milling · Nutenfräsen	**SMP01**  B125  B126	Cutting depth: see the detailed information about tool specifications Schnitttiefe: siehe detailierte info: in der Werkzeug spezifikation.	XSEQ12**	Slot milling of steel, stainless steel and cast iron. Nutenfräsen von Stahl und Grauguss	• Diameter range Ø100-Ø250 • Two mounting types: mounting by keyway and Arbor • Groove width range : 4, 5, 6, 7, 8mm • Durchmesser Bereich Ø100-Ø250 • Zwei Aufnahme Typen : Längsnut und Quernut • Nutenbreiten Bereich : 4, 5, 6, 7, 8mm
	SMP03  B129  B130		MPHT**	Slot milling of steel, stainless steel and cast iron. Nutenfräsen von Stahl und Grauguss	• Diameter range Ø80-Ø250 • Two mounting types: mounting by keyway and Arbor • Groove width range : 4, 5, 6, 7, 8mm • Durchmesser Bereich Ø80-Ø250 • Zwei Aufnahme Typen : Längsnut und Quernut • Nutenbreiten Bereich : 4, 5, 6, 7, 8mm
Special milling (high feed) Spezialfräsen für hohe Vorschube	**XMR01**  B132  B132	Cutting depth: see the detailed information about tool specifications Schnitttiefe: siehe detailierte info: in der Werkzeug spezifikation.	SDMT**-DM	Face and profile milling of steel, stainless steel and cast iron in cavity applications Plan- und Formfräsen von Stahl, rostfreiem Stahl und Grauguss	• Diameter range Ø25-Ø100 • Two mounting types: Straight shank and Arbor • The cutting forces are decomposed effectively, realize cutting with high feed rate. • For plunge milling • Double clamping, firm and reliable. • Durchmesser Bereich Ø25-Ø100 • als Schaft- und Aufsteckfräser • Die Schnittkräfte werden axial konzentriert. Der Fräser ist für hohe Vorschübe geeignet. • Tauchfräsen möglich. • Doppeltes Klemmsystem für WSP.
	 B135  B136		WPGT**ZSR	Face and profile milling of steel, stainless steel and cast iron in cavity applications Plan- und Formfräsen von Stahl, rostfreiem Stahl und Grauguss	• Diameter range Ø20-Ø100 • Two mounting types: Straight shank and Arbor • The cutting forces are decomposed effectively, realize cutting with high feed rate. • Double clamping, firm and reliable. • Durchmesser Bereich Ø25-Ø100 • als Schaft und Aufsteckfräser • Die Schnittkräfte werden axial konzentriert. Der Fräser ist für hohe Vorschübe geeignet. • Doppeltes Klemmsystem für WSP.

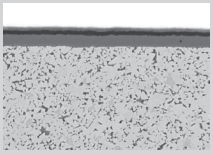
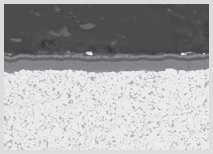
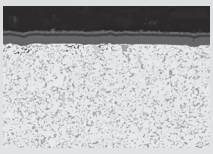
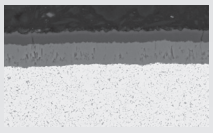
	Serie	Approach Angle / max. depth of cut Einstellwinkel/ max. Schnitttiefe	Insert WSP	Application Anwendung	Features Merkmale
T-slot milling T-Nutenfräsen	**TMP01**  B140	Kr=90°	MPHT**	Machining T slot in cast iron T-Nuten von Gusseisen	• Diameter range Ø21-Ø60 • Machining the T-slot with size range 12, 14, 18, 22, 28, 36 mm. • 86° rhombic inserts with positive angle. • Durchmesser Bereich Ø21-Ø60 • T-Nutenfräsen im Bereich von 12, 14, 18, 22, 28, 36mm. • 86° rhombische WSP mit positivem Winkel.
Helical end mills · Walzenstirnfräser	**HMP01**  B141	Kr=90° a_{pmax}=55	APKT150412-** SPMT120408-**	Milling of steel, alloy steel and cast iron with large cutting depth. Fräsen von Stahl, leg. Stahl und Grauguss. Bei großen Schnitttiefen.	• Diameter range Ø40-Ø80 • Coarse and differential pitch, less vibration • Holistic structure with good rigidity, interchangeable heads achieve high economical efficiency. • Durchmesser Bereich Ø40-Ø80 • Weite und normale Teilung, weniger Vibrationen • Holistic Struktur mit hoher Stabilität, austauschbare Fräsköpfe für hohe Effizienz und Wirtschaftlichkeit.
	 B142-143	Kr=90° a_{pmax}=144			
	HMP01 EC  B144	Kr=90° a_{pmax}=144			
Chamfer milling · Fasenfräser	**CMZ01**  B147	Kr=30°	SPMT120408	Chamfer machining of steel, alloy steel, stainless steel and cast iron Fasenfräsen von Stahl, leg. Stahl, rostfreiem Stahl und Gusseisen	• Diameter range Ø12, Ø25, Ø32, Ø36 • With the function of milling small surface • Durchmesser Bereich Ø12, Ø25, Ø32, Ø36 • Einsatz bei kleinen Flächen
	CMA01  B148	Kr=45°			
	CMD01  B149	Kr=60°			

NOTIZEN:

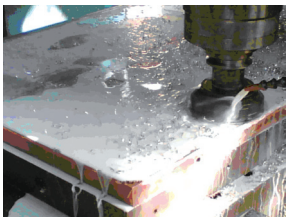
Comparison table for milling Insert - Grades
Fräswendeplatten Übersichtstabelle - Sorten



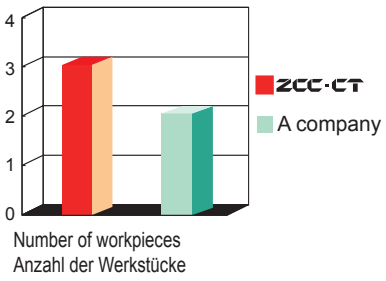
Coated Cemented Carbide CVD
Beschichtetes Hartmetall CVD

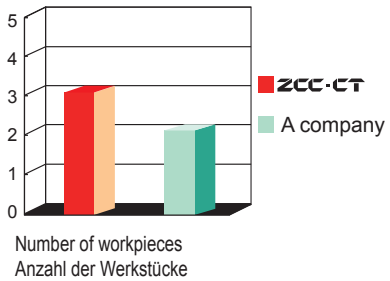
Grade · Sorte	Coating · Beschicht.	Micro-Structure	ISO	Application Anwendung
YBC301	Substrate with high strength, in combination with MT-Ti(CN), thin layer Al_2O_3 and TiN Coating. Beschichtetes Hartmetall mit hoher Schneidkanten-sicherheit. In Kombination mit TiCN Al_2O_3, und TiN.		P15~35	Suitable for light and midium milling of low alloy steel and non alloy steel, even under unfavorable condition. Gut geeignet für leichte bis mittlere Fräsbearbeitung von niedriglegierten Stählen unter schwierigen Bedingungen.
YBC401	Substrate with excellent thoughness, in combination with Ti(CN), thin layer Al2 O3, TIN. CVD beschichtetes Hartmetall mit einer guten Wärmeleitfähigkeit.		P25~50 M20~40	It is suitable for medium to heavy milling steels and stainless steel. Zum Fräsen von rostfreiem Stahl, warmfestem
YBM251	Substrate with good thoughness and strength, in combination with Ti(CN), thin layer Al2 O3, TiN. Universal einsetzbares CVD-beschichtete Hartmetallsorte aus TiN +MT-TiCN + dünner Al_2O_3 + TiN mit guter Zähigkeit und Verschleißfestigkeit.		P15~40 M10~30	Good performance in milling of alloy steel and stainless steel. Gute Eigenschaft zum Fräsen von legiertem und rostfreiem Stahl.
YBM351	MT-TiCN+Al2 O3 coated carbide grade with very good strength and impact resistance. Beschichtete Hartmetallsorte MT-TiCN+Al_2O_3 mit ausgezeichneter Widerstandsfähigkeit und Schneidkantensicherheit.		P25~40 M20~40	It is for milling of alloy steel and stainless steel. Zum Fräsen von legiertem und rostfreiem Stahl
YBD152	Hard medium fine corn Substrate in combination with TiCN, thick Al2 O3 coating. Hartes mittel-feinkörniges Subtrat mit TiCN, dicker Al_2O_3 Beschichtung.		K05~25	It is suitable for machinig of gray cast iron and nodular cast iron under normal cutting conditions from low to moderate cutting speeds. Bearbeitung von Guss und Kudelgraphitguss mit niedrigen bis mittleren Schnittgeschwindigkeiten.
YBD252	Tough subtrate in combination with TiN, TiCN, thick Al2 O3 coating. For milling of cast iron and alloy steel. Zähes Subtrat mit TiCN, dicke Al_2O_3 Beschichtung.		K15~35	For milling of cast iron and alloy steel. Zum Fräsen von Grauguss und legiertem Stahl.

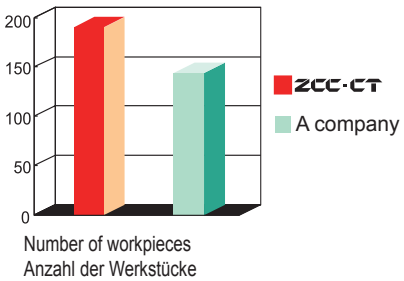
Application
Anwendung

Component Werkstück			
Machine Maschine	NC milling machine, wet machining NC Fräsmaschine, Kühlung	Verti. machining center, dry machining Verticales Bearb.-center, trocken	Horizontal mach. center, dry mach. Horizontales Bearb.-center, trocken
Workp. material & hardness Werkstückstoff & Härte	Casting stainless steel HB220-260 rostfreier Stahlguss	45 Forged steel HB240-270 Kohlenstoffstahl	HT250* HB220
Type of machining Bearbeitung	Face milling Planfräser	Face milling Planfräser	Face milling Planfräser
Milling tool Fräswerkzeug	FMA04-200-C60-OF07-12	FMA01-125-B40-SE12-08	FMP02-100-B32-SE12-07
Applicable insert Fräsplatte	YBM251/OFKR0704-DM	YBM351/SEET12T3-DR	YBD252/SEET120308PER-PM
Cutting data Schnittdaten	Vc=120m/min, fz=0.15mm/z, a_p=2mm	Vc=212m/min, fz=0.2mm/z, a_p=3mm	Vc=160m/min, fz=0.2mm/z, a_p=1.5mm

Application results
Ergebnis





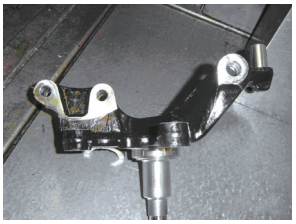
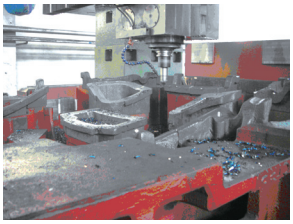


* = Germany GG25 Materialvergleichtabelle in Kapitel E

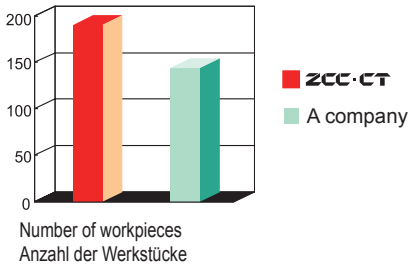
Coated Cemented Carbide PVD
Beschichtetes Hartmetall PVD

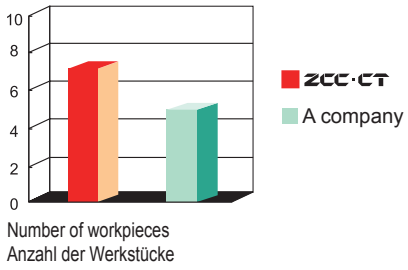
Grade · Sorte	Coating · Beschicht.	ISO	Application Anwendung
YBG102	PVD nano-TiAlN coated fine grain hard carbide grade. Nano-TiAlN PVD-beschichtete, feinkörnige Hartmetallsorte.	K05~K20	For light milling of cast iron, hard steel. Zum Schlichtfräsen von Guss und gehärtetem Stahl.
YBG202	PVD nano-TiAlN coated fine grain hard carbide grade. Good performance in combination of thoughness and wear resistance. Nano-TiAlN PVD-beschichtestes, feinkörnige Hartmetallsorte. Hervorragende Kombination von Zähigkeit und Verschleißfestigkeit.	P10~30 M10~30 S05~20	Milling of steel, finishing and semi-finishing of stainless steel, cast iron and hightemperature alloys . Zum Fräsen von Stahl, rostfreiem Stahl, Guss und warmfesten Superlegierungen bei leichter und mittlerer Bearbeitung.
YBG205	Special PVD nano-TiAlN coated fine grain hard carbide grade. Good performance in combination of thoughness and wear resistance. Sonder Nano-TiAlN PVD-beschichtestes, feinkörnige Hartmetallsorte. Hervorragende Kombination von Zähigkeit und Verschelißfestigkeit.	P10~30 M10~30 S05~20	Milling of steel, finishing and semi-finishing of stainless steel, cast iron and hightemperature alloys . Zum Fräsen von Stahl, rostfreiem Stahl, Guss und warmfesten Superlegierungen bei leichter und mittlere Bearbeitung
YBG302	Substrate with reasonable hardness and strength + Nano-TiAlN PVD coating Substrate mit einer angemessen Härte und Festigkeit + Nano-TiAlN PVD Beschichtung.	M10~30 S05~20	For rough and semi-finish milling of steel stainless and cast iron. Anwendung für mittlere- und Schruppbearbeitung von Stahl, rostfreiem Stahl und Guss.
YBG152	Substrate with medium hardness and strength + Nano-TiAlN PVD coating Substrate mit mittlerer Härte und Festigkeit + Nano-TiAlN PVD Beschichtung	K 20~35	Applicable for rough and semi-finish milling of steel stainless and cast iron. Anwendung für Schrupp- und mittlerer Bearbeitung. von Stahl, rostfreiem Stahl und Guss.
YBG252	ultra fine carbide substrate plus nano-TiALN PVD coating with high strength, thougness and wear resistance. Ultra-feinkorn-Hartmetall mit hoher Zugfestigkeit, Zähigkeit- und Verschleißfestigkeit, plus Nano-TiAN PVD-Beschichtung.	P05~20 M05~20 K05~K20	special for finishing of alloy steel, stainless steel and cast iron. sonder zum schlichten von legiertem Stahl, rostfreiem Stahl und Guss.

Application
Anwendung

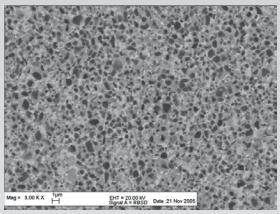
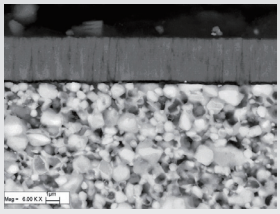
Component Werkstück		
Machine Maschine	Machining center, dry cutting Bearbeitungscenter, trocken	Horizontal milling machine, dry cutting Horizontal Fräsmaschine, Trockenbearbeitung
Workp. material & hardness Werkstückstoff & Härte	Nodular cast iron HB 220 Guss	7CrSiMoV HRC25
Type of machining Bearbeitung	Face milling Planfräser	Profil milling Formfräsen
Milling tool Fräswerkzeug	EMP02-050-A22-AP11-06	BMR03-050-MT5-M
Applicable insert Fräsplatte	YBG102/APKT11T308-PM	YBG302/XPHT50R2507- GM
Cutting data Schnittdaten	Vc=235m/min, fz=0.15mm/z, ap=1~3mm	Vc=120m/min, fz=0.25mm/z, ap=8mm

Application results
Ergebnis

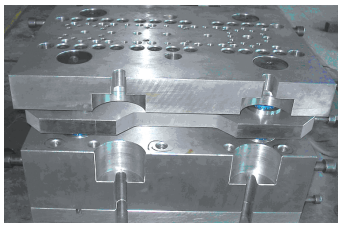


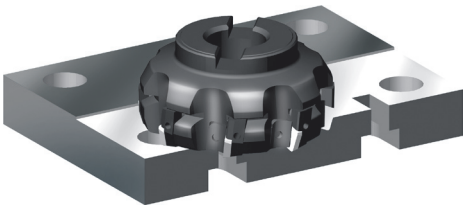


Cermet

Grade · Sorte	Micro-Structure	ISO	Application Anwendung
YNG151		P05~20 M05~20 K05~20	Applicable for finishing P, M & K ISO Code Anwendung für die Schlichtbearbeitung P,M und K ISO Anwendungsbereich
YNG151C		P01~20 M01~20 K01~20	Applicable for finish milling P, M and K ISO Code Anwendung für die Schlichtbearbeitung P,M und K ISO Anwendungsbereich

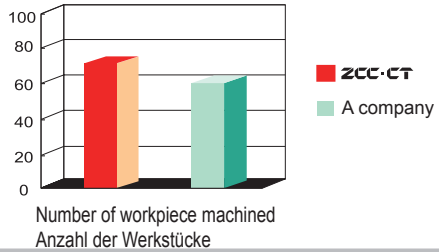
Application Anwendung

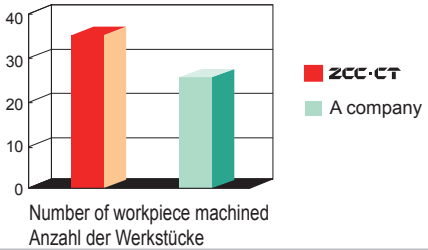




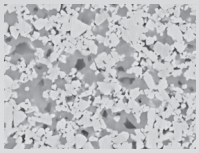
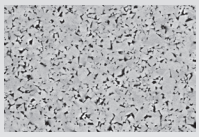
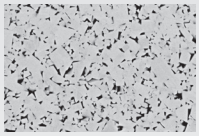
Machine Maschine	Machining center, dry cutting Bearbeitungscenter, Trockenbearbeitung	Machining center, dry cutting Bearbeitungscenter, Trockenbearbeitung
Workp. material & hardness Werkstückstoff & Härte	45 steel HB 170~220 Stahl	NAK80* HRC42~48
Type of machining Bearbeitung	Face milling finishing Schlichtfräsen	Face milling finishing Schlichtfräsen
Milling tool Fräswerkzeug	FMA03-160-B40-SE12-08	FME03-160-B40-SP12-10
Applicable insert Fräsplatte	YNG151/SEEN1203AFTN	YNG151C/SPEN1203EDER
Cutting data Schnittdaten	Vc=400m/min, fz=0.1mm/z, a_p=0.3mm	Vc=420m/min, fz=0.12mm/z, a_p=0.35mm

Application results
Ergebnis

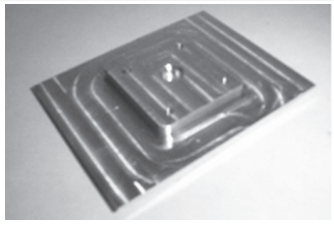
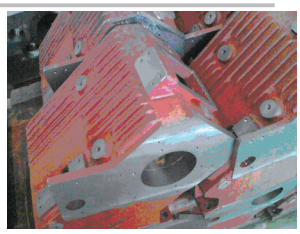




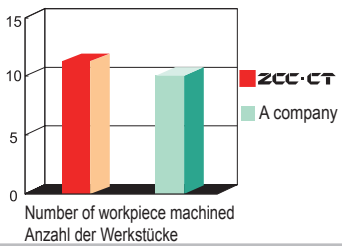
Cemented Carbide

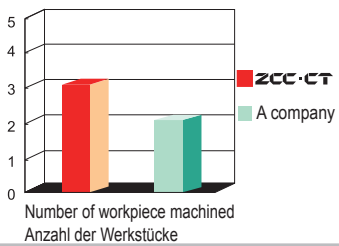
Grade · Sorte	Micro-Structure	ISO	Application Anwendung
YC30S		P25~40 M25~40	Applicable for roughing ISO Code P, M Anwendung für die Schruppbearbeitung ISO Anwendungsbereich P & M.
YD051		K05~20	Applicable for milling/ finishing type ISO Code K Anwendung für die Schlichtbearbeitung ISO Anwendungsbereich K.
YD101		N05~25	Applicable for semi-finish and finish milling type ISO Code N. Anwendung für die Mittlere bis Feinbearbeitung ISO Anwendungsbereich N.
YD201		K15~35 N15~30	Applicable for rough and semi-finish ISO Code K , and for rough milling ISO Code N. Anwendung für die schrupp - mittlerer Bearbeitung ISO Anwend. K und für die Schruppbearbeitung N ISO Anwendung.

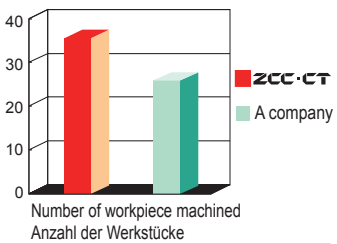
Application Anwendung

Component Werkstück			
Machine Maschine	Verti. machining center, wet machining Vertikales Bearbeitungscenter, Kühlmittel	Face milling machine, wet machining Planfräsmaschine, Kühlmittel	Face milling machine, dry cutting Planfräsmaschine, Trockenbearbeitung
Workp. material & hardn. Werkstückstoff & Härte	Aluminum alloy HB100	40CrMnMo HB240	HT250 HB220
Type of machining Bearbeitung	Face milling Planfräser	Face milling Planfräser	Face milling Planfräser
Milling tool Fräswerkzeug	FMA01-100-B32-SE12-07	FMP01-100-B32-TP22-06	FME03-160-B40-SP15-10
Applicable insert Fräsplatte	YD101/SEET12T3-LH	YC30S/TPKN2204PDR	YD201/SPKN1504EDTR
Cutting data Schnittdaten	Vc=300-350m/min, a_p=1-2mm, fz=0.2mm/z	Vc=170m/min, a_p=5-7mm fz=0.3mm/z	Vc=100-130m/min, a_p=7mm, fz=0.35mm/z

Application results
Ergebnis

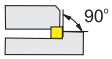
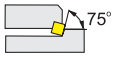
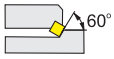
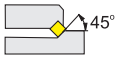
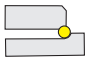






Indexable milling tools code key · Kennzeichnung Fräsen ISO Code

Cutter style / Fräser Typ	
FM	Face milling tools Planfräser
EM	Shoulder face milling tools Eck-und Nutenfräser
HM	Helix end milling tools Walzenstirnfräser
SM	Side and face milling tools Scheibenfräser
BM	Profile milling tools Kopierfräser
CM	Chamfering end milling tools Fasfräser
XM	Special milling tools Sonderfräser
TM	

Lead angle Einstellwinkel der Platten		
P	**90°**	
E	**75°**	
D	**60°**	
A	**45°**	
R		

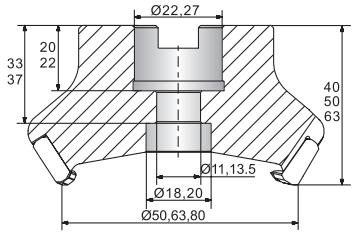
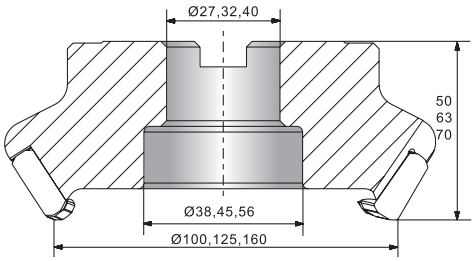
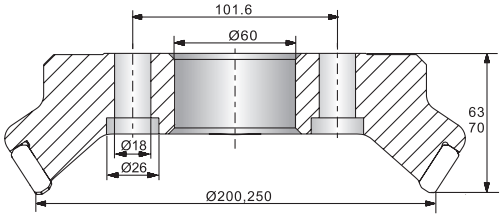
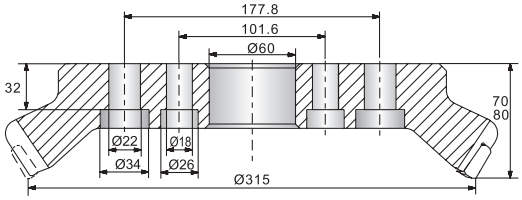
Serial number
Serien Nr.

Tool diameter
Werkzeug Durchmesser
Side and face milling tool :
diameter x cutting edge width

Plan- und Eckfräser:
Durchmesser x WSP-Breite

Coupling size (mm) (as follow figure)
Aufnahmetyp

FM E 03 100 - B 32

Structure shape and size of positioning Ausführung und Größe von Werkzeugaufnahme			
A	 Arbor Ø50-Ø80	B	 Arbor Ø100-Ø160
C	 Arbor Ø200-Ø250	D	 Arbor Ø315
G	Cylinderical Shank / Zylinderschaft	**MW**	MW
XP	Weldon		

Regarding to the Weldon shank, straight shank and Morse taper shank etc coupling method, please refer to the technical data of tooling systems

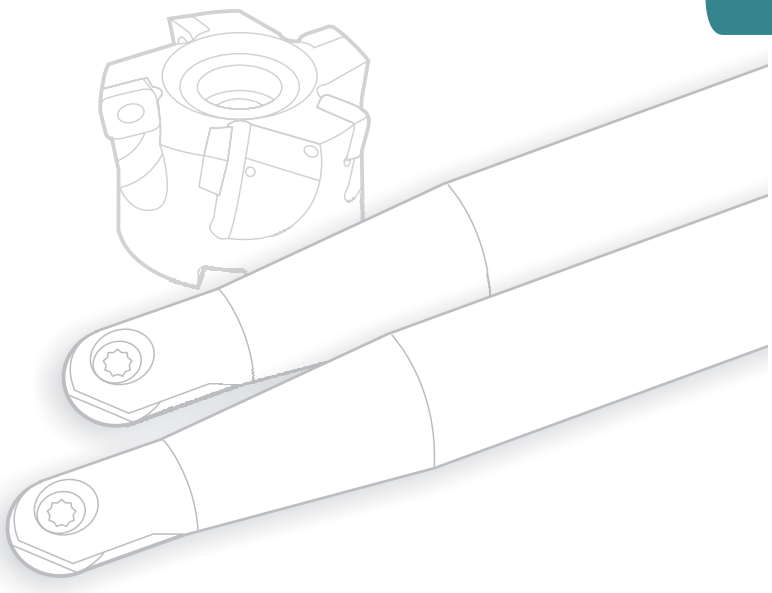
Cutting edge length of insert Schneidenlänge	
80° C	55° D
R	S
60° T	L
H	O

Insert clearance angle Freiwinkel der Platten	
N	0°
B	5°
C	7°
P	11°
D	15°
E	20°
F	25°

Cutting edge length of insert Schneidenlänge						
Diameter Durchmesser	Insert Shape / Plattenform					
	C	D	R	S	T	L
5.556	—	—	—	—	09	—
6.350	06	07	—	—	11	—
9.525	09	11	09	09	16	—
12.700	12	15	12	12	22	—
15.875	16	19	15	15	27	—
19.050	19	—	19	19	33	—
25.400	25	—	25	25	44	25

S - P 12 - 06 L C

- Number of teeth / Anzahl Zähne
- Cutting direction / Schnittrichtung R= right/rechts L=left/ links
- With Internal cooling / Mit Innenkühlung



Face Milling Tools · Planfräser

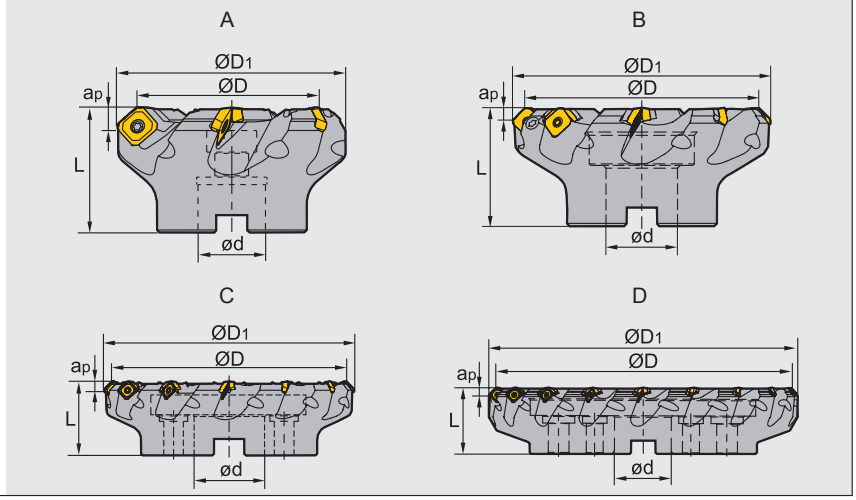
Kr:45°



FMA01 P M K N S



Close pitch (D)
Enge Teilung (D)



Specification of tools · Werkzeug Beschreibung

Type · Typ		Stock Lager R	Stock Lager L	Dimension (mm) Abmessung Ø D	Ø D1	Ø D	L	apmax	No. of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)
FMA01	**-050-A22-SE12-04**	●	○	50	61	22	40	6	4	A	0.3
	-050-A22-SE12-04C	○	○	50	61	22	40	6	4	A	0.3
	-063-A22-SE12-05	●	○	63	74	22	40	6	5	A	0.5
	-063-A22-SE12-05C	○	○	63	74	22	40	6	5	A	0.5
	-080-A27-SE12-06	●	○	80	91	27	50	6	6	A	1.2
	-080-A27-SE12-06C	○	○	80	91	27	50	6	6	A	1.2
	-100-B32-SE12-07	●	○	100	107	32	50	6	7	B	1.2
	-100-B32-SE12-07C	○	○	100	107	32	50	6	7	B	1.2
	-125-B40-SE12-08	●	○	125	136	40	63	6	8	B	2.6
	-125-B40-SE12-08C	○	○	125	136	40	63	6	8	B	2.6
	-160-B40-SE12-10	●	○	160	170	40	63	6	10	B	4.3
	-200-C60-SE12-12	●	○	200	210	60	63	6	12	C	7.6
	-250-C60-SE12-14	●	○	250	260	60	63	6	14	C	13.5
	-315-D60-SE12-18	●	○	315	325	60	70	6	18	D	20.8

Spare Parts · Ersatzteile

Diameter Durchmesser Ø D	Screw Schraube	Shim Unterlage	Shim screw Unterlagenschraube	Wrench Schlüssel	Wrench Schlüssel
Ø50 -Ø100	I60M3.5×10	--	--	WT15IS	--
Ø125-Ø315	I60M3.5×12	S13BS	SM5×7XA		WH35L

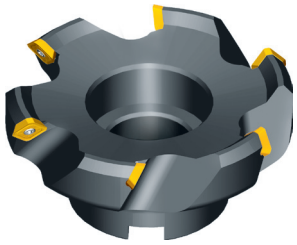


● Ex Stock / ab Lager ○ On demand / auf Anfrage

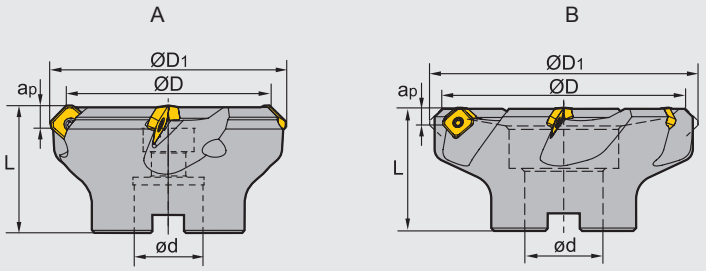
Face Milling Tools · Planfräser

Kr:45°

FMA02 P M K N S



Coarse and differential pitch
normale und weite Teilung



Specification of tools · Werkzeug Beschreibung

Type · Typ		Stock Lager R	Stock Lager L	Dimension (mm) Abmessung Ø D	Ø D1	Ø D	L	apmax	No. of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)
FMA02	-050-A22-SE12-03	●	○	50	61	22	40	6	3	A	0.4
	-063-A22-SE12-04	●	○	63	74	22	40	6	4	A	0.6
	-080-A27-SE12-04	●	○	80	91	27	50	6	4	A	1.3
	-100-B32-SE12-05	●	○	100	107	32	50	6	5	B	1.3
	-125-B40-SE12-06	●	○	125	131	40	63	6	6	B	2.6

Spare Parts · Ersatzteile

Diameter Durchmesser Ø D	Screw Schraube	Wrench Schlüssel
Ø50-Ø125	I60M3.5×10	WT15IS



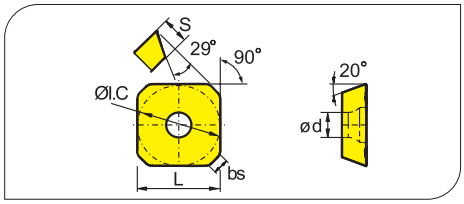
Applicable tool B9-B15
Werkzeug
Tools code key B24-B25
Werkzeug ISO
Grade selection guide B17-23
Sortenauswahl
Technical data B182-B188
Technische Daten

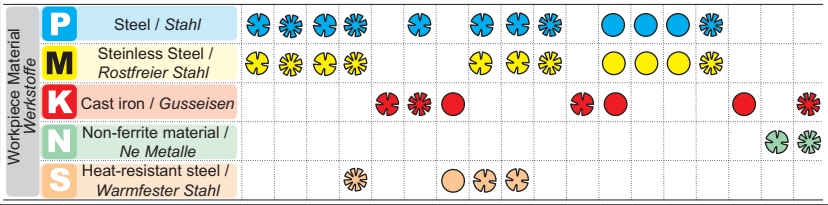
Ideal Machining Condition
Gute Bearbeitungsbedingungen

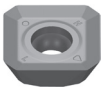
Normal Machining Condition
Normale Bearbeitungsbedingungen

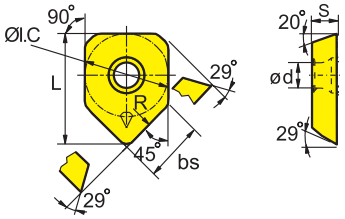
Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen

Applicable inserts · Wendeschneidplatten





Insert shape Plattenform	Type · Typ	Dimension (mm) Abmessung						CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	I.C	S	d	bs	R	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**SEET12T3-DF**	13.4	13.4	3.97	4.1	2.55		●		●	●				●										
	SEET12T3-CF	13.4	13.4	3.97	4.1	2.55						●		●											
	SEET12T3-EF	13.4	13.4	3.97	4.1	2.55									○		●								
	**SEET12T3-DM**	13.4	13.4	3.97	4.1	2.55		●	●	●	●														
	SEET12T3-CM	13.4	13.4	3.97	4.1	2.55						●		●											
	SEET12T3-EM	13.4	13.4	3.97	4.1	2.55				●							●								
	**SEET12T3-DR**	13.4	13.4	3.97	4.1	2.55		●	●		●		●		○		○								
	SEET12T3-CR	13.4	13.4	3.97	4.1	2.55						●	○												
	**SEET12T3-LH**	13.4	13.4	3.97	4.1	2.55																		●	●
	**SEET12T3-W**	17.82	13.4	3.97	4.1	9.46	500			○		●			●		○								○



● Ex Stock / ab Lager ○ On demand / auf Anfrage

Chipbreaker Selektion for FMA01/02 · Spanbrecher Auswahl für FMA01/02

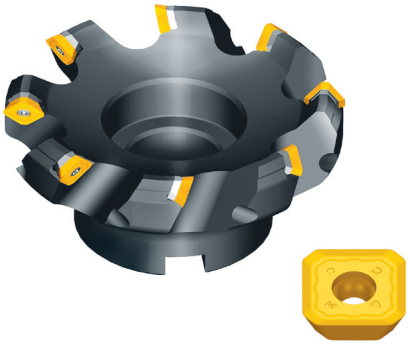
Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	Roughing Schruppen
P	-DF	-DM	-DR
M S	-EF	-EM	
K	-CF	-CM	-CR
N	-LH		

Recommended cutting data · Empfohlene Schnittdaten

Workpiece material Werkstückstoff		Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten			
				V (m/min)	f (mm/z)		
					-DF	-DM	-DR
P	Low-carbon steel Soft steel Niedrig legierter Kohlenstoffstahl Baustahl	≤180	YBM251 YBC301	270(220-350)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
			YBG202 YBG205	270(200-360)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
			YBG302	230(170-350)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
	High-carbon steel Alloy steel Hoch Leg. Kohlenstoffstahl	180-280	YBM251 YBC301	240 (200-320)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
			YBG202 YBG205	240 (180-350)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
			YBG302	220 (150-330)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
	Alloy tool steel Leg. Werkzeugstahl	280-350	YBM251 YBC301	220 (180-300)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
			YBG202 YBG205	220 (170-340)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
			YBG302	190 (130-300)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
M					-EF	-EM	
	Stainless steel Rostfreier Stahl	≤270	YBM251	150 (120-240)	0.15(0.1-0.2)	0.2 (0.1-0.3)	
			YBG202 YBG205	160 (110-270)	0.15(0.1-0.2)	0.2 (0.1-0.3)	
			YBG302	140 (100-250)	0.15(0.1-0.2)	0.2 (0.1-0.3)	
K					-CF	-CM	-CR
	Cast iron Gusseisen	180-250	YBG102	210 (120-300)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
			YBD152	240 (180-300)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
N					-LH		
	Al alloy NE-Metalle	-	YD101	300-	0.25 (0.1-0.4)		
			YD201	300-			
S					-EF	-EM	
	High temperature alloy Hoch warmfeste Leg.	≤400	YBG102	50(20-60)	0.1 (0.1-0.2)	0.15 (0.1-0.3)	
			YBG202 YBG205	40(20-50)	0.1 (0.1-0.2)	0.15 (0.1-0.3)	

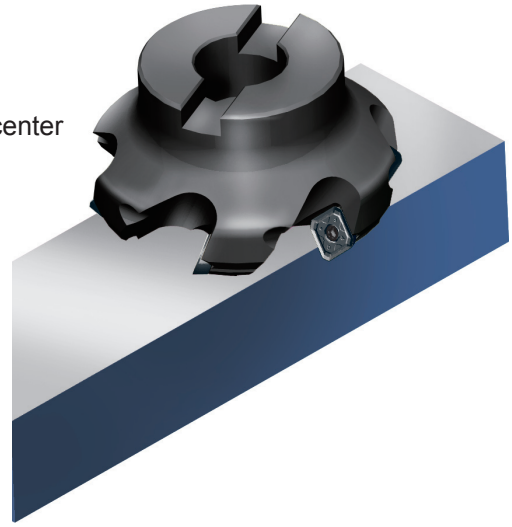
Case study for FMA 01
Bearbeitungsbeispiel für FMA 01

Workpiece material
Werkstückstoff: 1Cr18Ni9Ti (HB180)
Cooling system
Kühlsystem: dry cutting, trocken



Machine
Maschine: vertical machining center
vertikales Mascinencenter

Cutting data
Schnittdaten:
Vc=160m/min
ap=1mm
fz=0.2mm/z
ae=60mm

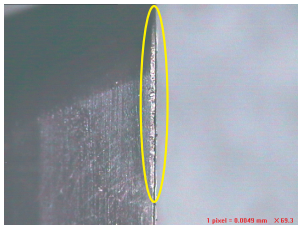
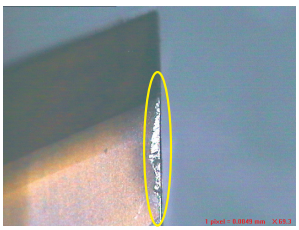


■ Tool · Werkzeug: FMR01-080-A27-SE12-06
■ Inserts · WSP: SEET12T3-DM/YBG202

Surface roughness of workpiece
Rauhtiefe des Material

ZCC-CT:Ra1.2
Other company product: Ra1.6

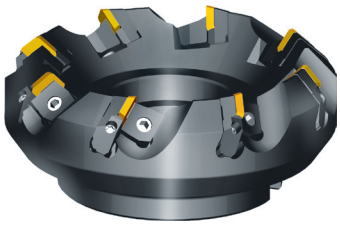
- **Wear comparison of insert.**
- **Verschleißvergleich der WSP**

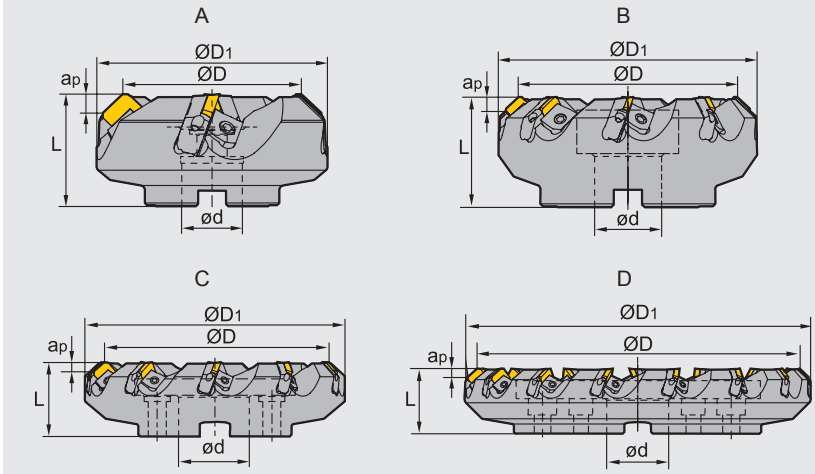
	ZCC-CT	Other company product
17'30"		
29'30"		
33'30"		

Face Milling Tools · Planfräser

Kr:45°

FMA03 P M K



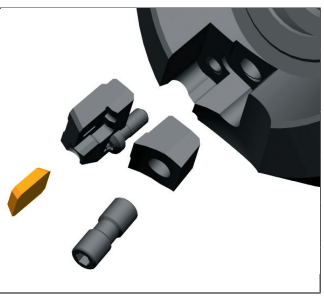


Specification of tools · Werkzeug Beschreibung

Type · Typ		Stock Lager R	Stock Lager L	Dimension (mm) Abmessung Ø D	Ø D1	Ø D	L	apmax	No. of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)
FMA03	**-080-A27-SE12-04**	○	○	80	103	27	50	5.5	4	A	1.8
	-100-B32-SE12-05	○	○	100	122	32	50	5.5	5	B	2.4
	-125-B40-SE12-06	○	○	125	147	40	63	5.5	6	B	4.4
	-160-B40-SE12-08	○	○	160	181	40	63	5.5	8	B	6.4
	-200-C60-SE12-10	○	○	200	221	60	63	5.5	10	C	8.5
	-250-C60-SE12-12	○	○	250	270	60	63	5.5	12	C	14.1
	-315-D60-SE12-15	○	○	315	353	60	63	5.5	15	D	22.2
	-080-A27-SE15-04	○	○	80	103	27	50	7.5	4	A	1.7
	-100-B32-SE15-05	○	○	100	122	32	50	7.5	5	B	2.3
	-125-B40-SE15-06	○	○	125	147	40	63	7.5	6	B	4.2
	-160-B40-SE15-08	○	○	160	181	40	63	7.5	8	B	6.1
	-200-C60-SE15-10	○	○	200	221	60	63	7.5	10	C	8.3
	-250-C60-SE15-12	○	○	250	270	60	63	7.5	12	C	13.6
	-315-D60-SE15-15	○	○	315	353	60	63	7.5	15	D	21.8

Parts · Ersatzteile

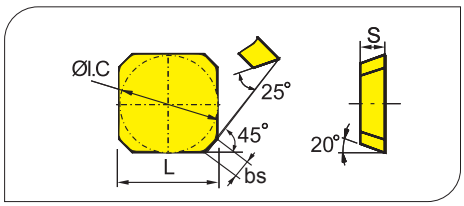
Diameter Durchmesser Ø D	Insert Platte	Cassette Kassette	Wedge Keil	Wedge screw Keilschraube	Locator screw Schraube	Wrench Schlüssel
Ø80-Ø315	SE12	LSE12R/L	W01R/L	DM8×21X	LOM5×15.1	WT20T WH40T
Ø80-Ø315	SE15	LSE15R/L				



● Ex Stock / ab Lager ○ On demand / auf Anfrage

Applicable tool Werkzeug B9-B15
Tools code key Werkzeug ISO B24-B25
Grade selection guide Sortenauswahl B17-23
Technical data Technische Daten B182-B188

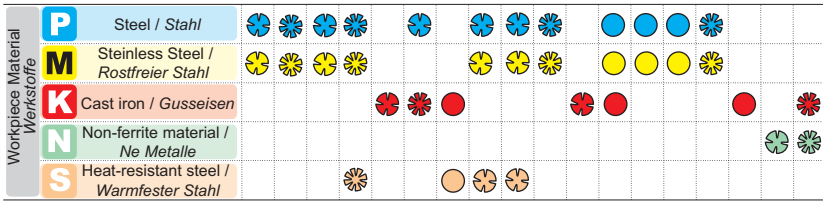
Applicable inserts · Wendeschneidplatten



Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen



Insert shape Plattenform	Type · Typ	Dimension (mm) Abmessung				CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	I.C	S	bs	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**SEEN1203AFTN**	12.7	12.7	3.18	1.8																		
	SEKN1203AFFN	12.7	12.7	3.18	1.8																		
	SEKN1203AFN	12.7	12.7	3.18	1.8	●														○		●	
	SEKN1203AFTN	12.7	12.7	3.18	1.8	●		●										●		●			●
	**SEKR1203AFN**	12.7	12.7	3.18	1.8	●	○						●										
	**SEKN1504AFN**	15.875	15.875	4.76	1.6	○																○	○
	SEKN1504AFTN	15.875	15.875	4.76	1.6	●	●	●												●			
	**SEKR1504AFN**	15.875	15.875	4.76	1.6																		

● Ex Stock / ab Lager ○ On demand / auf Anfrage

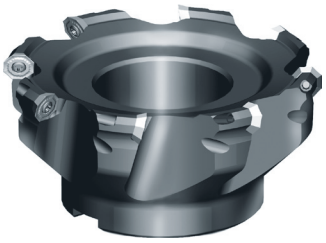
Recommended cutting data · Empfohlene Schnittdaten

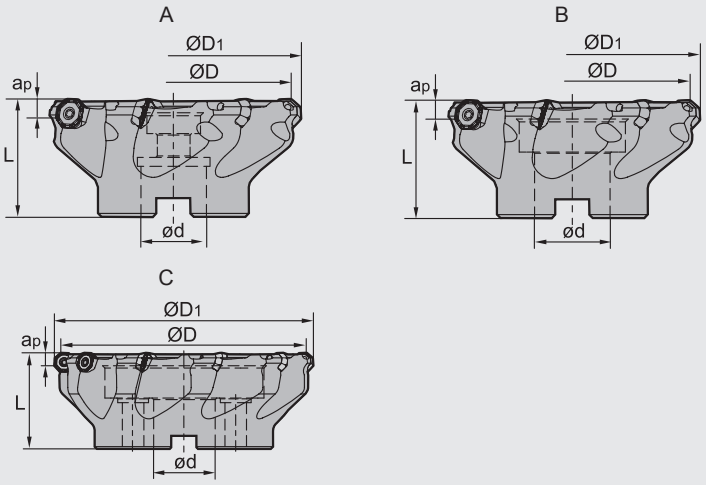
Workpiece material Werkstückstoff		Hardness HB Härte	Garde Sorte	Cutting data · Schnittdaten	
				V (m/min)	f (mm/z)
P	Low-carbon steel Soft steel Niedrig legierter Kohlenstoffstahl Baustahl	≤180	YNG151	430 (340-500)	0.2 (0.1-0.4)
			YBM251 YBC301	270 (220-350)	0.2 (0.1-0.4)
			YBM351	220 (180-300)	0.25 (0.15-0.3)
			YBG202 YBG205	270 (200-360)	0.2 (0.1-0.3)
			YC30S	140 (100-220)	0.27 (0.1-0.4)
	High-carbon steel Alloy steel Hoch Leg. Kohlenstoffstahl	180-280	YNG151	400 (320-480)	0.2 (0.1-0.4)
			YBM251 YBC301	240 (200-320)	0.2 (0.1-0.4)
			YBM351	200 (160-280)	0.25 (0.15-0.3)
			YBG202 YBG205	240 (180-350)	0.2 (0.1-0.3)
			YC30S	120 (80-200)	0.27 (0.1-0.4)
	Alloy tool steel Leg. Werkzeugstahl	280-350	YNG151	350 (300-450)	0.2 (0.1-0.4)
			YBM251 YBC301	220 (180-300)	0.2 (0.1-0.4)
			YBM351	180 (150-250)	0.25 (0.15-0.3)
			YBG202 YBG205	220 (170-340)	0.2 (0.1-0.3)
			YC30S	100 (60-180)	0.27 (0.1-0.4)
M	Stainless steel Rostfreier Stahl	≤270	YNG151	220 (160-280)	0.2 (0.1-0.4)
			YBM251	130 (100-220)	0.2 (0.1-0.4)
			YBM351	140 (100-240)	0.25 (0.15-0.3)
			YBG202 YBG205	140 (100-250)	0.2 (0.1-0.3)
K	Cast iron Gusseisen	180-250	YBG102	210 (120-300)	0.2 (0.1-0.3)
			YBD252	200 (150-250)	0.2 (0.1-0.4)
			YD201	100 (80-160)	0.25 (0.1-0.4)

Face Milling Tools · Planfräser

Kr:45°

FMA04 P M K N

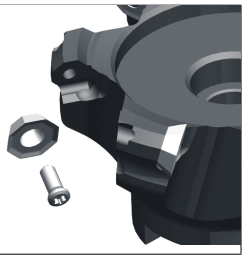




Specification of tools · Werkzeug Beschreibung

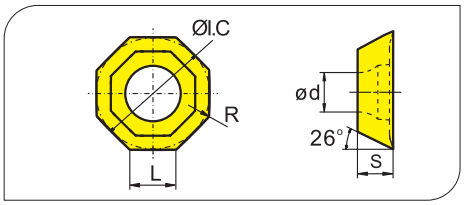
Type · Typ		Stock Lager		Dimension (mm) Abmessung					No. of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)
		R	L	Ø D	Ø D1	Ø D	L	apmax			
FMA04	**-050-A22-OF05-04**	●	○	50	56	22	40	3.5	4	A	0.3
	-050-A22-OF05-05	○	○	50	56	22	40	3.5	5	A	0.4
	-050-A22-OF05-05C	○	○	50	56	22	40	3.5	5	A	0.4
	-063-A22-OF05-05	●	○	63	69	22	40	3.5	5	A	0.5
	-063-A22-OF05-05C	○	○	63	69	22	40	3.5	5	A	0.5
	-080-A27-OF05-06	●	○	80	86	27	50	3.5	6	A	0.8
	-080-A27-OF05-06C	○	○	80	86	27	50	3.5	6	A	0.8
	-100-B32-OF05-07	●	○	100	106	32	50	3.5	7	B	1.2
	-100-B32-OF05-07C	○	○	100	106	32	50	3.5	7	B	1.2
	-125-B40-OF05-08	●	○	125	130	40	63	3.5	8	B	2.7
	-125-B40-OF05-08C	○	○	125	130	40	63	3.5	8	B	2.7
	-160-B40-OF05-10	●	○	160	165	40	63	3.5	10	B	5.1
	-160-C40-OF05-10			160	165	40	63	3.5	10	C	4.1

Parts · Ersatzteile

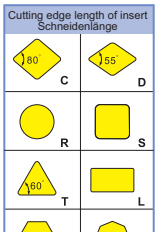
Diameter Durchmesser Ø D	Screw Schraube	Wrench Schlüssel	
			
Ø50- Ø63	I60M4×8.4	WT15IS	
Ø80 -Ø160	I60M4×10		

● Ex Stock / ab Lager ○ On demand / auf Anfrage

Applicable inserts · Wendeschneidplatten



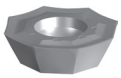
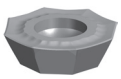
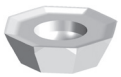
Cutting edge length of insert Schneidenlänge



Insert clearance angle Freiwinkel der Platten	
N	0°
B	5°
C	7°
P	11°
D	15°
E	20°

Cutting edge length of insert Schneidenlänge

Diameter Durchmesser	Insert Shape / Plattenform					
	C	D	R	S	T	L
5.556	—	—	—	—	09	—
6.350	06	07	—	—	11	—
9.525	09	11	09	09	16	—
12.700	12	15	12	12	22	—
15.875	16	19	15	15	27	—
19.050	19	—	19	19	33	—

Insert shape Plattenform	Type · Typ	Dimension (mm) Abmessung					CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	I.C	S	d	R	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**OFKT05T3-DF**	5.26	12.7	3.97	4.4	0.5			○	○			●	●		●								
	**OFKT05T3-DM**	5.26	12.7	3.97	4.4	0.5							●	●		●								
	**OFKT05T3-LH**	5.26	12.7	3.97	4.4	0.5																	●	

Chipbreaker Selektion FMA04 · Spanbrecher Auswahl FMA04

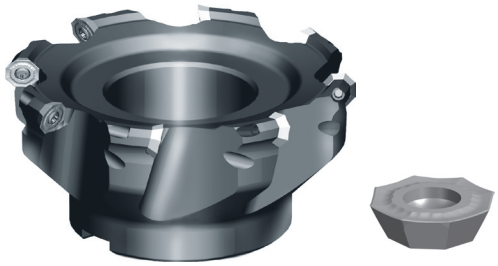
Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung
P	-DF	-DM
M		
K		
AL	-LH	

Applicable tool B9-B15 Werkzeug
Tools code key B24-B25 Werkzeug ISO
Grade selection guide B17-23 Sortenauswahl
Technical data B182-B188 Technische Daten

Recommended cutting data · Empfohlene Schnittdaten

Workpiece material Werkstückstoff		Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten		
				V (m/min)	f (mm/z)	
					-DF	-DM
P	Low-carbon steel Soft steel Niedrig legierter Kohlenstoffstahl Baustahl	≤180	YBM251	270 (220-350)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
			YBG202 YBG205	270 (200-360)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
			YBM351	220 (180-300)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
			YBG302	230 (170-350)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
	High-carbon steel Alloy steel Hoch Leg. Kohlenstoffstahl	180-280	YBM251	240 (200-320)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
			YBG202 YBG205	240 (180-350)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
			YBM351	200 (160-280)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
			YBG302	220 (150-330)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
	Alloy tool steel Leg. Werkzeugstahl	280-350	YBM251	220 (180-300)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
			YBG202 YBG205	220 (170-340)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
			YBM351	180 (150-250)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
			YBG302	190 (130-300)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
M	Stainless steel Rostfreier Stahl	≤270	YBG202 YBG205	160 (110-270)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
			YBG302	140 (100-250)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
			YBM251	150 (120-250)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
K	Cast iron Gusseisen	180-250	YBG102	210 (120-300)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
					-LH	
N	Al alloy leg. Alu	-	YD101	300-	0.15 (0.05-0.3)	

Case study for FMA04
Bearbeitungsbeispiel für FMA04

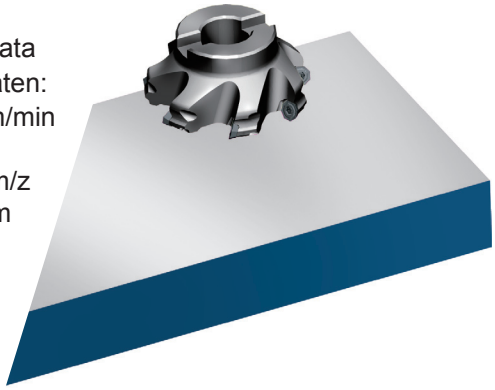


■ Tool · Werkzeug: FMA04-100-B32-OF05-07
■ Inserts · WSP: OFKT05T3-DM/YBG202

Workpiece material
Werkstückstoff: 42CrMo (HB200)
Cooling system
Kühlsystem: dry cutting, trocken

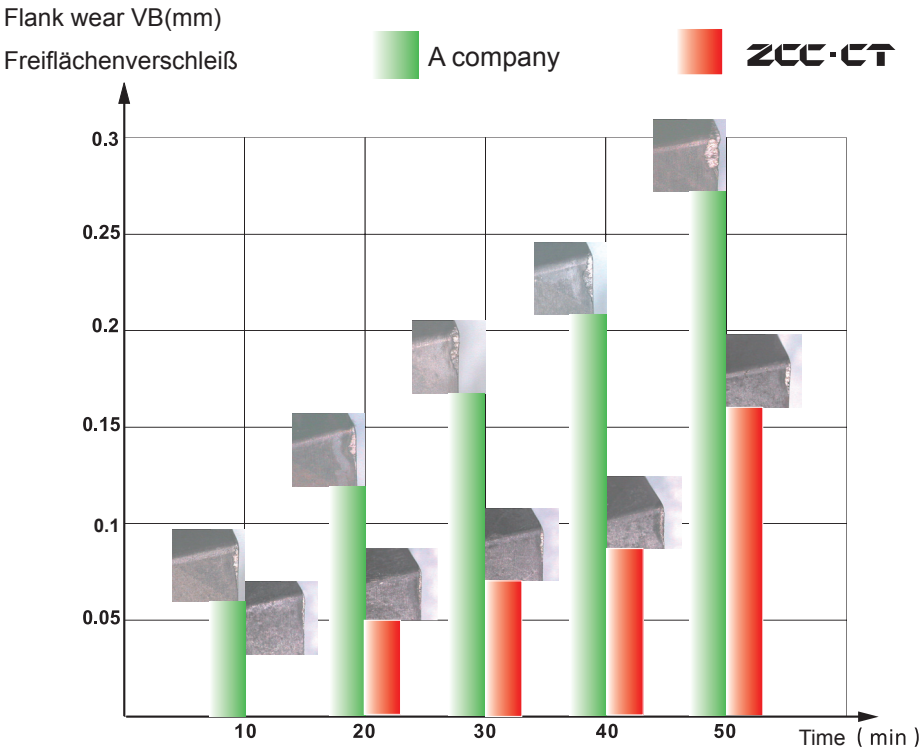
Machine:vertical machining center
Maschine: vertikales Maschinencenter

Cutting data
Schnittdaten:
Vc=180m/min
ap=1mm
fz=0.2mm/z
ae=60mm



Surface roughness
Rauhtiefe
ZCC-CT: Ra1.2
Other company product Ra1.6

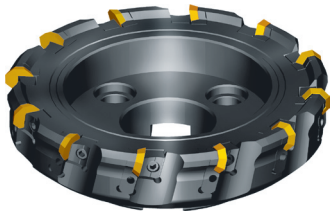
- **Wear comparison of insert**
- **Verschleißvergleich der WSP**



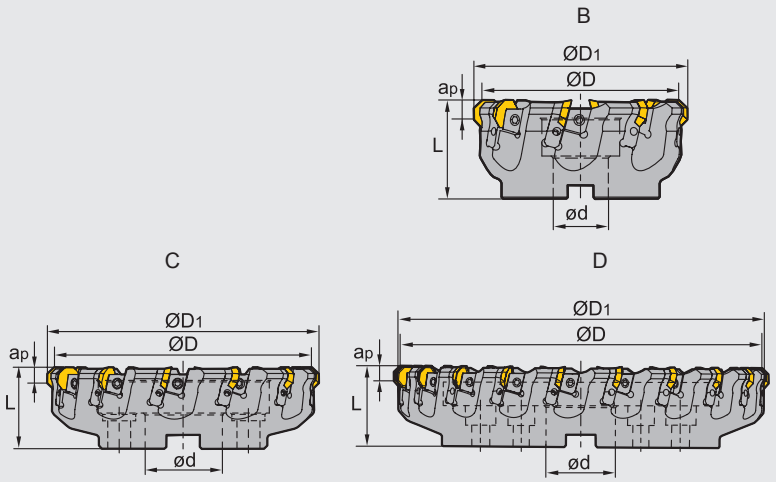
Face Milling Tools · Planfräser

Kr:45°

FMA04 P M K



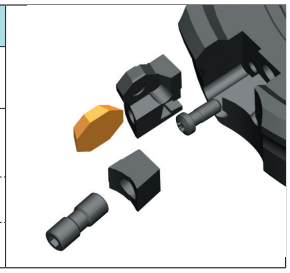
Wedge
Keil



Specification of tools · Werkzeug Beschreibung

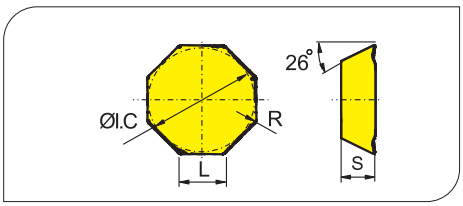
Type · Typ		Stock Lager		Dimension (mm) Abmessung					No. of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)
		R	L	Ø D	Ø D1	Ø D	L	apmax			
FMA04	**-125-B40-OF07-08**	●	○	125	136	40	63	5	8	B	3.9
	-160-B40-OF07-10	●	○	160	171	40	63	5	10	B	5.9
	-200-C60-OF07-12	●	○	200	211	60	63	5	12	C	7.6
	-250-C60-OF07-16	●	○	250	261	60	63	5	16	C	13.3
	-315-D60-OF07-20	●	○	315	321	60	63	5	20	D	20.3

Parts · Ersatzteile

Diameter Durchmesser Ø D	Cassette Kassette	Wedge Keil	Wedge screw Keilschraube	Locator screw Einstellschraube	Wrench Schlüssel	
						
Ø125-Ø315	LOF07R/L	W02R/L	DM8×21X	LOM5×15.1	WT20T WH40T	

● Ex Stock / ab Lager ○ On demand / auf Anfrage

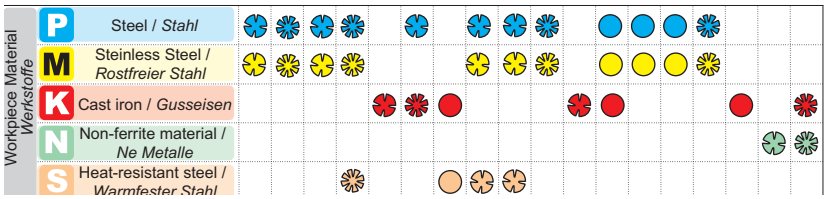
Applicable inserts · Wendeschneidplatten



Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen



Insert shape Plattenform	Type · Typ	Dimension (mm) Abmessung				CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	I.C	S	R	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**OFKR0704-DF**	7.45	17.94	4.76	0.8			●					●										
	**OFKR0704-DM**	7.45	17.94	4.76	0.8	●	●	●	●	●	●	●	●		○								
	OFKR0704W-DM	7.45	17.94	4.76		●					●		○	●									

Chipbreaker Selektion FMA04 · Spanbrecher Auswahl FMA04

Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung
P	-DF	-DM
M		
K		

Applicable tool B9-B15
Werkzeug

Tools code key B24-B25
Werkzeug ISO

Grade selection guide B17-23
Sortenauswahl

Technical data B182-B188
Technische Daten

Recommended cutting data · Empfohlene Schnittdaten

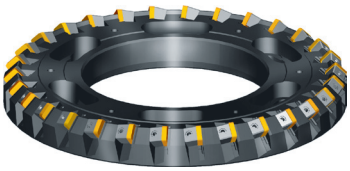
Workpiece material Werkstückstoff		Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten		
				V (m/min)	f (mm/z)	
					-DF	-DM
P	Low-carbon steel Soft steel Niedrig legierter Kohlenstoffstahl Baustahl	≤180	YBM251 YBC301	270 (220-350)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
			YBG202 YBG205	270 (200-360)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
			YBM351	220 (180-300)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
			YBG302	230 (170-350)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
	High-carbon steel Alloy steel Hoch Leg. Kohlenstoffstahl	180-280	YBM251 YBC301	240 (200-320)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
			YBG202 YBG205	240 (180-350)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
			YBM351	200 (160-280)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
			YBG302	220 (150-330)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
	Alloy tool steel Leg. Werkzeugstahl	280-350	YBM251 YBC301	220 (180-300)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
			YBG202 YBG205	220 (170-340)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
			YBM351	180 (150-250)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
			YBG302	190 (130-300)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
M	Stainless steel Rostfreier Stahl	≤270	YBG202 YBG205	160 (110-270)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
			YBG302	140 (100-250)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
			YBM251	150 (120-250)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
K	Cast iron Gusseisen	180-250	YBG102	210 (120-300)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
			YBD252	200 (150-250)	0.2 (0.1-0.3)	0.25 (0.1-0.4)

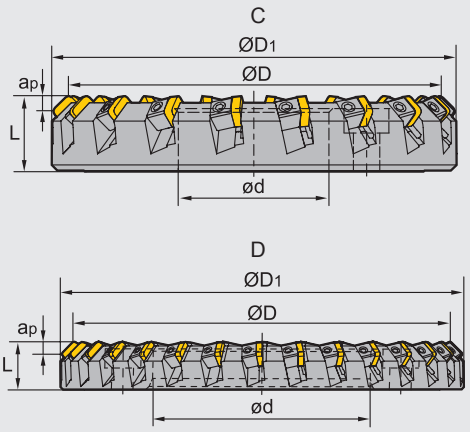
● Ex Stock / ab Lager ○ On demand / auf Anfrage

Face Milling Tools · Planfräser

Kr:45°

FMA05 P K

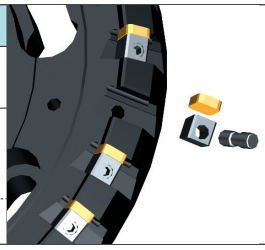




Specification of tools · Werkzeug Beschreibung

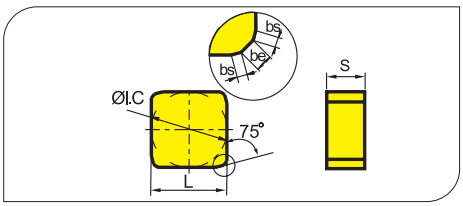
Type · Typ		Stock Lager		Dimension (mm) Abmessung					No. of teeth Zähne	Adapter	Weight Gewicht (kg)
		R	L	Ø D	Ø D1	Ø D	L	apmax			
FMA05	**-200-C60-SN12-18**	○	○	200	215	80	40	5	18	Adapter1	6.9
	-250-C60-SN12-24	○	○	250	265	120	40	5	24	Adapter2	9.4
	-315-D60-SN12-30	○	○	315	330	180	40	5	30	Adapter3	12.5
	-355-D60-SN12-34	○	○	355	370	220	40	5	34	Adapter4	15.1
	-400-D60-SN12-38	○	○	400	415	250	40	5	38	Adapter5	18.4
	-450-D60-SN12-44	○	○	450	465	300	40	5	44	Adapter6	21.7
	-200-C60-SN15-18	○	○	200	220	80	40	5.5	18	Adapter1	6.9
	-250-C60-SN15-24	○	○	250	270	120	40	5.5	24	Adapter2	9.4
	-315-D60-SN15-30	○	○	315	335	180	40	5.5	30	Adapter3	12.6
	-355-D60-SN15-34	○	○	355	375	220	40	5.5	34	Adapter4	15.2
	-400-D60-SN15-38	○	○	400	420	250	40	5.5	38	Adapter5	18.4
	-450-D60-SN15-44	○	○	450	470	300	40	5.5	44	Adapter6	21.8

Parts · Ersatzteile

Diameter Durchmesser Ø D	Insert Platte	Wedge Keil	Wedge screw Keilschraube	Wrench Schlüssel	
					
Ø200-Ø450	SN12	W04N	DM8×21X	WH40T	
	SN15	W05N			

Applicable tool B9-B15 Werkzeug
Tools code key B24-B25 Werkzeug ISO
Grade selection guide B17-23 Sortenauswahl
Technical data B182-B188 Technische Daten

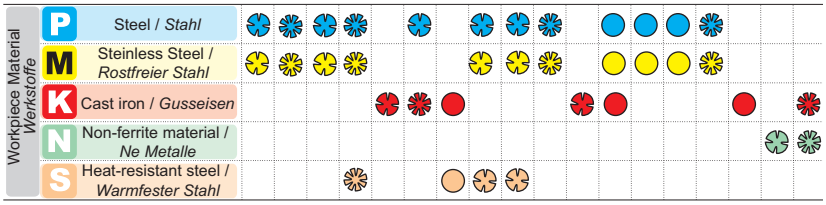
Applicable inserts · Wendeschneidplatten



Ideal Machining Condition
Gute Bearbeitungsbedingungen

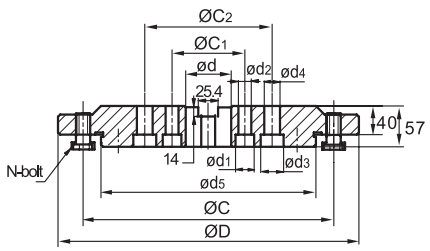
Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen



Insert shape Plattenform	Type · Typ	Dimension (mm) Abmessung					CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	I.C	S	be	bs	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**SNKN1204ENN**	12.7	12.7	4.76	0.9	1.5	●				●										●			●
	**SNKN1504ENN**	15.875	15.875	4.76	0.9	1.5	●			○											●			

Specification of tools · Werkzeug Beschreibung

Adapter	Dimension (mm) Abmessung											
	Type · Typ	Ø D	Ø D	Ø D_1	Ø D_2	Ø D_3	Ø D_4	Ø D_5	ØC	ØC_1	ØC_2	N	Tool Ø D
	Adapter1	180	60	26	18	--	--	80	120	101.6	--	4	Ø200
	Adapter2	230	60	26	18	--	--	120	170	101.6	--	4	Ø250
	Adapter3	290	60	26	18	32	22	180	230	101.6	177.8	6	Ø315
	Adapter4	330	60	26	18	32	22	220	270	101.6	177.8	6	Ø355
	Adapter5	370	60	26	18	32	22	250	300	101.6	177.8	6	Ø400
	Adapter6	420	60	26	18	32	22	300	350	101.6	177.8	6	Ø450

Recommended cutting data · Empfohlene Schnittdaten

Workpiece material Werkstückstoff		Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten	
				V (m/min)	f (mm/z)
P	Low-carbon steel Soft steel Niedrig legierter Kohlenstoffstahl Baustahll	180-280	YBC301	120 (100-180)	0.25 (0.1-0.4)
			YC30S	100 (80-150)	0.25 (0.1-0.4)
	alloy steel Leg. Stahl	280-350	YBC301	100 (80-180)	0.2 (0.1-0.4)
			YC30S	80 (60-120)	0.2 (0.1-0.4)
K	Cast iron Gusseisen	180-250	YBD152	150 (110-190)	0.2 (0.1-0.4)
			YD201	100 (80-160)	0.25 (0.1-0.4)

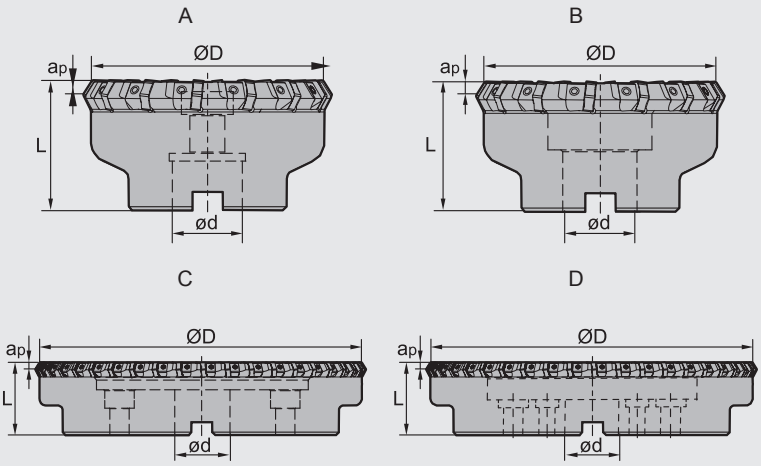
● Ex Stock / ab Lager ○ On demand / auf Anfrage

Face Milling Tools · Planfräser

Kr:58°

FMD02 K



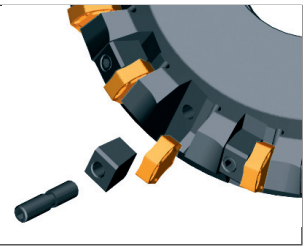


Specification of tools · Werkzeug Beschreibung

Type · Typ		Stock Lager R	Stock Lager L	Dimension (mm) Abmessung Ø D	Ø D	L	apmax	No. of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)
FMD02	**-080-A27-HN09-08**	○	○	80	27	50	4	8	A	1.1
	-100-B32-HN09-10	○	○	100	32	63	4	10	B	2.6
	-125-B40-HN09-14	○	○	125	40	70	4	14	B	3.7
	-160-B40-HN09-18	○	○	160	40	63	4	18	B	5.6
	-200-C60-HN09-22	○	○	200	60	63	4	22	C	6.3
	-250-C60-HN09-28	○	○	250	60	63	4	28	C	10.3
	-315-D60-HN09-32	○	○	315	60	63	4	32	D	21.7

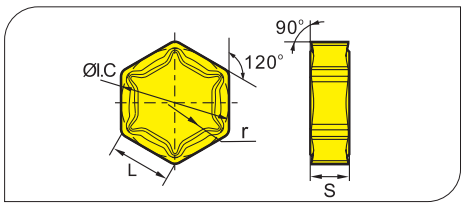
Parts · Ersatzteile

Diameter Durchmesser Ø D	Wedge Keil	Wedge screw Keilschraube	Wrench Schlüssel
			
Ø80-Ø315	W06T	DM6×25	WH30T



Applicable tool Werkzeug B9-B15
Tools code key Werkzeug ISO B24-B25
Grade selection guide Sortenauswahl B17-23
Technical data Technische Daten B182-B188

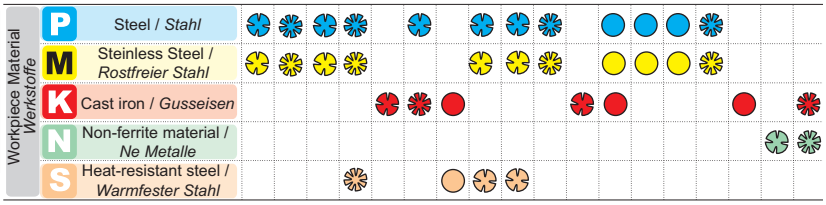
Applicable inserts · Wendeschneidplatten



Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen



Insert shape Plattenform	Type · Typ	Dimension (mm) Abmessung				CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	I.C	S	r	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**HNEX090512-DF**	9.16	15.875	5.56	1.2					●	●												
	**HNEX090512-DM**	9.16	15.875	5.56	1.2					●	●												
	**HNEX090512-DR**	9.16	15.875	5.56	1.2					●	●												

Chipbreaker Selektion FMD02 · Spanbrecher Auswahl FMD02

application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	Roughing Schruppen
K	-DF	-DM	-DR

Recommended cutting data · Empfohlene Schnittdaten

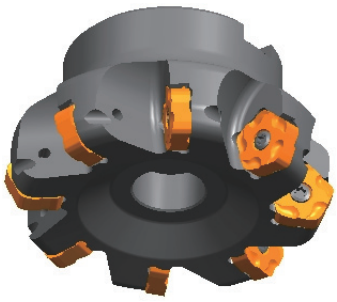
Workpiece material Werkstückstoff		Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten			
				V (m/min)	f (mm/z)		
					-DF	-DM	-DR
K	Cast iron Gusseisen	180-250	YBD152	180 (110-250)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.5)
			YBD252	130 (110-200)	0.2(0.1-0.2)	0.25 (0.1-0.3)	0.3(0.2-0.5)

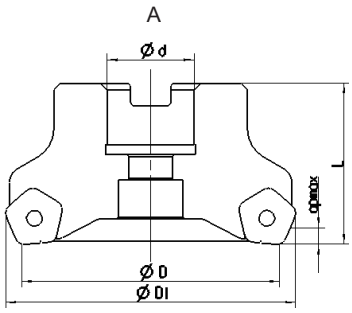
● Ex Stock / ab Lager ○ On demand / auf Anfrage

Face Milling Tools · Planfräser

Kr:67°

FMD02 K



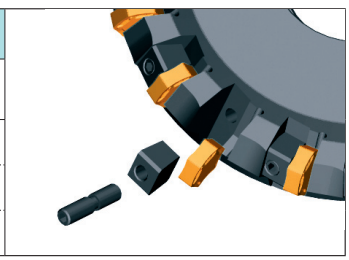


Specification of tools · Werkzeug Beschreibung

Type · Typ		Stock Lager		Dimension (mm) Abmessung				No. of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)
		R	L	Ø D	Ø d	L	$a_p$max			
FMD02	**-050-A22-PN11-05**	●	○	50	22	50	3.5	5	A	0.6
	-063-A22-PN11-06	●	○	63	22	50	3.5	6	A	0.85
	-080-A27-PN11-08	●	○	80	27	50	3.5	8	A	1.2
	-100-B32-PN11-10	●	○	100	32	50	3.5	10	B	1.9
	-125-B40-PN11-12	●	○	125	40	63	3.5	12	B	3.2
	-160-B40-PN11-14	●	○	160	40	63	3.5	14	B	6.4

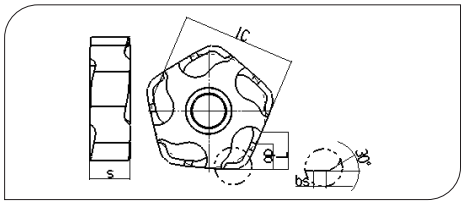
Parts · Ersatzteile

Diameter Durchmesser Ø D	Screw Schraube	Wrench Schlüssel		
				
Ø50-Ø160	I60M4×10	WT15IS		



Applicable tool Werkzeug B9-B15
Tools code key Werkzeug ISO B24-B25
Grade selection guide Sortenauswahl B17-23
Technical data Technische Daten B182-B188

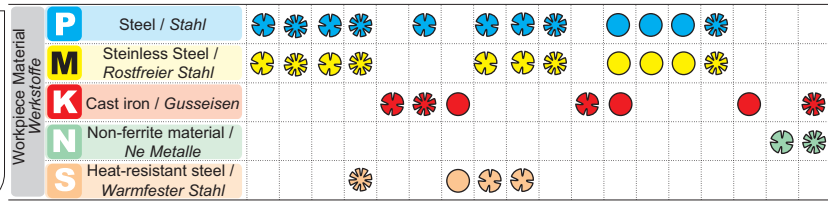
Applicable inserts · Wendeschneidplatten



Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen



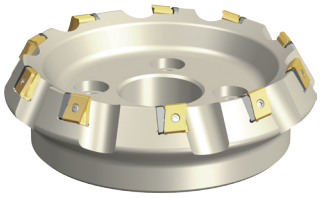
Insert shape Plattenform	Type · Typ	Dimension (mm) Abmessung					CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	I.C	S	bs	ap	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**PNEG110512R-CR**	5	15.875	5.56	1.6	3.5					●	●												
	PNEG110512R-CF	5	15.875	5.56	1.6	3.5					○	○												

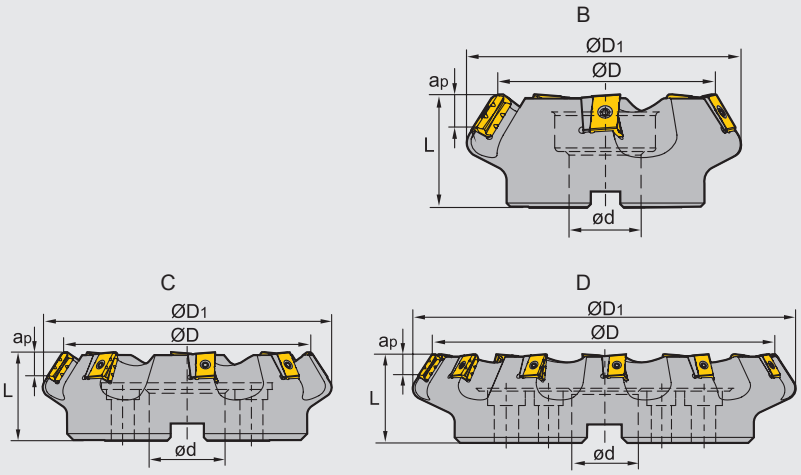
● Ex Stock / ab Lager ○ On demand / auf Anfrage

Face Milling Tools · Planfräser

Kr:60°

FMD03 P M





Specification of tools · Werkzeug Beschreibung

Type · Typ		Stock Lager		Dimension (mm) Abmessung					inserts WSP	No. of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)
				Ø D	Ø D1	Ø D	L	apmax				
FMD03	**-125-B40-LN20-06**	●	○	125	153	40	63	12	LNKT2007DN-ZR	6	B	4.5
	-160-C40-LN20-08	●	○	160	187	40	63	12		8	C	6.9
	-200-C60-LN20-10	●	○	200	227	60	70	12		10	C	10.5
	-250-C60-LN20-12	●	○	250	276	60	70	12		12	C	13.4
	-315-D60-LN20-15	○	○	315	339	60	80	12		15	D	26.2
	-125-B40-LN25-05	●	○	125	154	40	63	17	LNKT2510-ZR	5	B	4.5
	-160-C40-LN25-06	●	○	160	189	40	63	17		6	C	6.9
	-200-C60-LN25-08	●	○	200	229	60	70	17		8	C	10.5
	-250-C60-LN25-10	●	○	250	278	60	70	17		10	C	16.7
	-315-D60-LN25-12	○	○	315	346	60	80	17		12	D	27.3
	-400-D60-LN25-16	○	○	400	427	60	80	17		16	D	47.1

Parts · Ersatzteile

Diameter Durchmesser Ø D	Inserts Platten	Screw Schraube	Shim Unterlage	Shim Screw Unterlagen Schraube	Wrench Schlüssel	
Ø125-Ø315	LNKT2007DN-ZR	I60M3×17	LLN20R-ZR	I60M4×15	WT15IS	WT10IT
Ø125-Ø400	LNKT2510-ZR	I60M5×17	LLN25R-ZR	I60M3.5×10.4	WT20IS	WT15IT



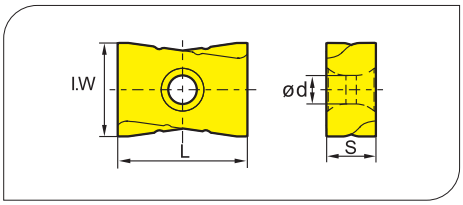
Applicable tool Werkzeug B9-B15
Tools code key Werkzeug ISO B24-B25
Grade selection guide Sortenauswahl B17-23
Technical data Technische Daten B182-B188

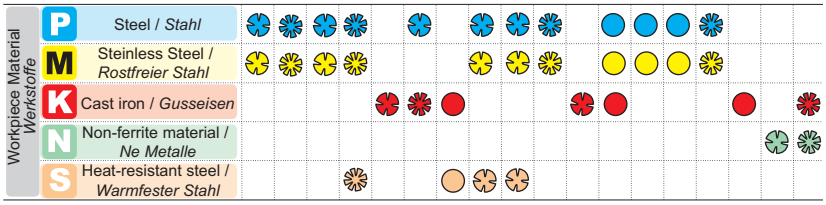
Applicable inserts · Wendeschneidplatten

Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen





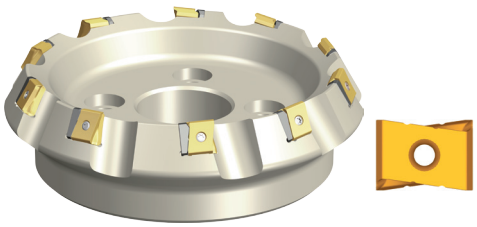
Insert shape Plattenform	Type · Typ	Dimension (mm) Abmessung					CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	I.W	S	d		YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**LNKT2007DN-ZR**	20	14	6.35	4,6					●		●				●								
	LNKT2510-ZR	25	18	9.525	5.5					●		●				●								

Recommended cutting data · Empfohlene Schnittdaten

Workpiece material Werkstückstoff		Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten	
				V (m/min)	f (mm/z)
P	Low-carbon steel Soft steel Niedrig legierte Kohlenstoffstahl Baustahl	≤180	YBG302	180 (150-300)	0.5 (0.2-0.8)
			YBM351	180 (150-300)	0.5 (0.2-0.8)
	High-carbon steel Alloy steel Hoch legierte Kohlenstoffstahl Leg. Stahl	180-280	YBG302	150 (120-280)	0.5 (0.2-0.8)
			YBM351	140 (120-280)	0.5 (0.2-0.8)
	Alloy tool steel Leg. Werkzeugstahl	280-350	YBG302	120 (80-250)	0.45 (0.2-0.6)
			YBM351	100 (80-250)	0.45 (0.2-0.6)
M	Stainless steel Rostfreier Stahl	≤270	YBG302	120 (80-200)	0.45 (0.2-0.6)
			YBM351	100 (80-200)	0.45 (0.2-0.6)

● Ex Stock / ab Lager ○ On demand / auf Anfrage

Case study for FMD03
Bearbeitungsbeispiel für FMD03



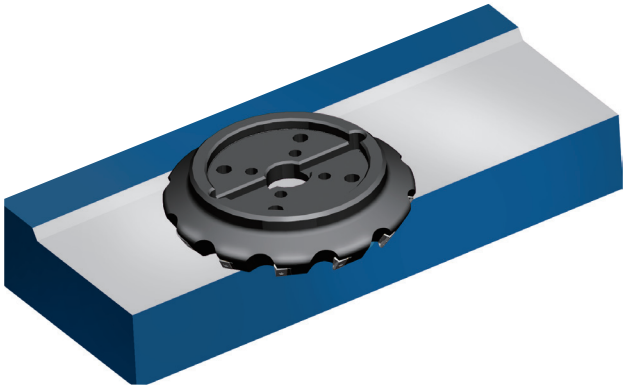
■ Tool · Werkzeug: FMD03-315-D60-LN25-12
■ Inserts · WSP: LNKT2510-ZR/YBG302

Workpiece material
Werkstückstoff: ASTMA743 CA-6NM class(HB200)

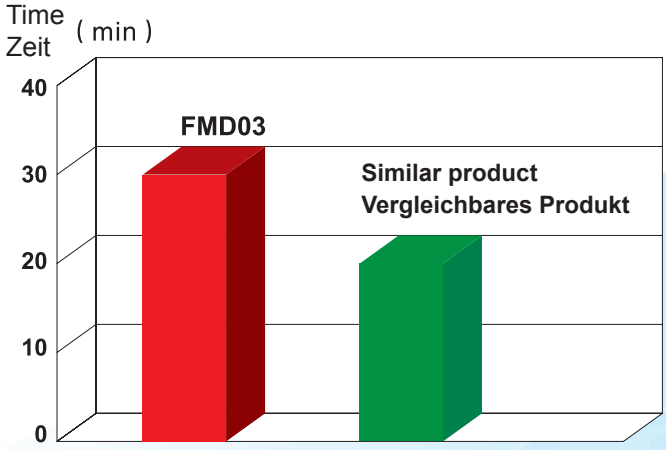
Cooling system
Kühlsystem: dry cutting, trocken

Machine
Maschine:
NC floor Type · Typ boring and milling machine,
spindle power≥30KW
Bohr-Fräszentrum Spindelkraft 230 KW

Cutting data
Schnittdaten:
Vc=200m/min
fz=0.3mm/z
ap=3mm



- **Wear comparison of insert**
- **Verschleißvergleich der WSP**



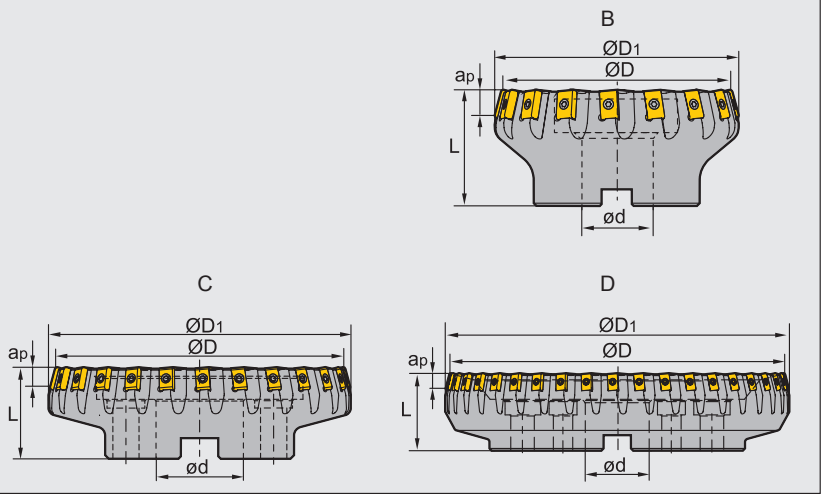
* = Germany 1.4008 Materialvergleichtabelle in Kapitel E

Face Milling Tools · Planfräser

Kr:75°

FME01 K





Specification of tools · Werkzeug Beschreibung

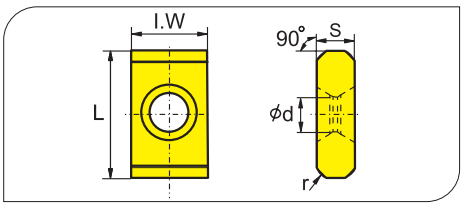
Type · Typ		Stock Lager		Dimension (mm) Abmessung					No. of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)
		R	L	Ø D	Ø D1	Ø D	L	apmax			
FME01	**-125-B40-LN15-16**	○	○	125	132	40	63	8	16	B	3.5
	-160-B40-LN15-20	○	○	160	168	40	63	8	20	B	6.1
	-200-C60-LN15-25	○	○	200	208	60	63	8	25	C	7.4
	-250-C60-LN15-32	○	○	250	257	60	63	8	32	C	13.1
	-315-D60-LN15-40	○	○	315	323	60	70	8	40	D	25.5

Parts · Ersatzteile

Diameter Durchmesser Ø D	Screw Schraube	Wrench Schlüssel	
			
Ø125-Ø315	I90M4×11	WT09S	

● Ex Stock / ab Lager ○ On demand / auf Anfrage

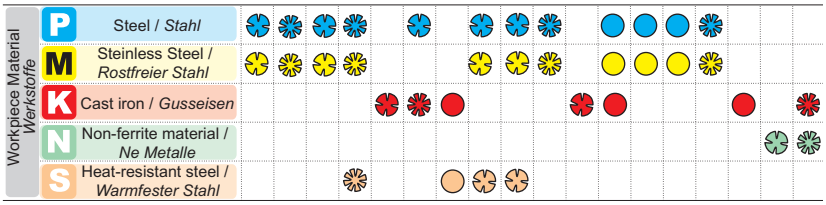
Applicable inserts · Wendeschneidplatten



Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen



Insert shape Plattenform	Type · Typ	Dimension (mm) Abmessung					CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	I.W	S	d	r	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**LNE32.534**	15.875	9.525	4.76	4.4	1.6				○	○													
	LNE32.534	15.875	9.525	4.76	4.2	45 Fase			○			○												

Recommended cutting data · Empfohlene Schnittdaten

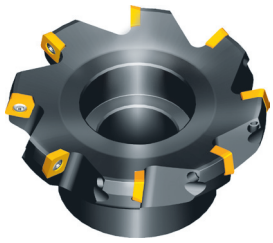
Workpiece material Werkstückstoff		Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten	
				V (m/min)	f (mm/z)
K	Cast iron Gusseisen	180-250	YBD152	150 (110-190)	0.2 (0.1-0.4)

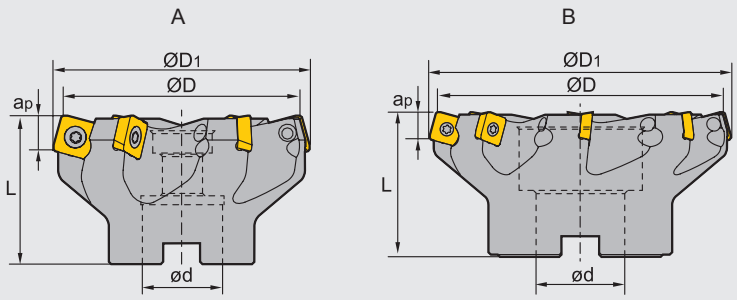
Applicable tool D14-D18
Tools code key B20-B21
Grade selection guide B15-B19
Technical data B164-B170

Face Milling Tools · Planfräser

Kr:75°

FME02





Specification of tools · Werkzeug Beschreibung

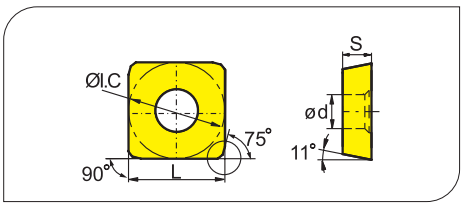
Type · Typ		Stock Lager	Dimension (mm) Abmessung					No. of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)
			Ø D	Ø D_1	Ø D	L	a_{pmax}			
FME02	**-050-A22-SP12-04**	○	50	54	22	40	6	4	A	0.3
	-063-A22-SP12-05	○	63	66	22	50	6	5	A	0.6
	-080-A27-SP12-06	○	80	83	27	50	6	6	A	0.9
	-100-B32-SP12-07	○	100	103	32	50	6	7	B	1.4
	-125-B40-SP12-08	○	125	128	40	63	6	8	B	2.5

Spare Parts · Ersatzteile

Diameter Durchmesser Ø D	Screw Schraube	Wrench Schlüssel	
			
Ø50-Ø125	I60M5×13.2	WT20IS	

● Ex Stock / ab Lager ○ On demand / auf Anfrage

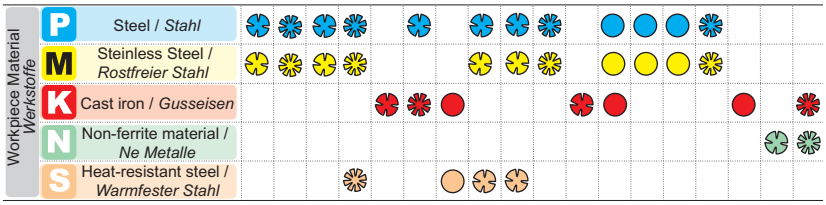
Applicable inserts · Wendeschneidplatten



Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen



Insert shape Plattenform	Type · Typ	Dimension (mm) Abmessung				CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	I.C	S	d	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**SPKW1204EDFR**	12.7	12.7	4.76	5.56								●										
	SPKW1204EDSR	12.7	12.7	4.76	5.56								●										
	**SPKT1204EDR**	12.7	12.7	4.76	5.56								●										

Chipbreaker Selektion FME02 · Spanbrecher Auswahl FME02

Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	Roughing Schruppen
P	EDFR	EDR	EDSR
M	EDFR	EDR	
K	EDFR	EDR	

Recommended cutting data · Empfohlene Schnittdaten

Workpiece material Werkstückstoff		Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten	
				V (m/min)	f (mm/z)
P	Low-carbon steel Soft steel	≤180	YBG202	270(200-360)	0.2 (0.1-0.3)
	High-carbon steel Alloy steel	180-280	YBG202	240 (180-350)	0.2 (0.1-0.3)
	Alloy tool steel Leg. Werkzeugstahl	280-350	YBG202	220 (170-340)	0.2 (0.1-0.3)
M	Stainless steel Rostfreier Stahl	≤270	YBG202	160 (110-270)	0.2 (0.1-0.3)
K	Cast iron Gusseisen	180-250	YBG202	160 (120-200)	0.2 (0.1-0.3)

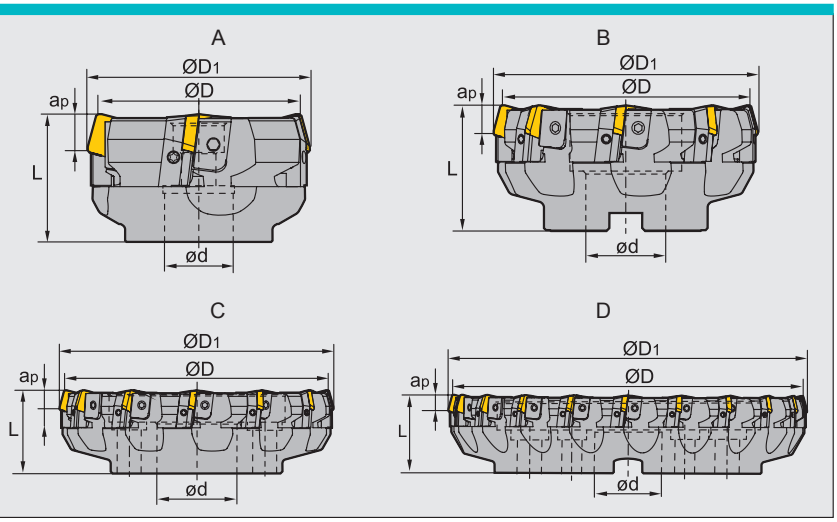
Applicable tool D14-D18
Tools code key B20-B21
Grade selection guide B15-B19
Technical data B164-B170

Face Milling Tools · Planfräser

Kr:75°

FME03 P M K

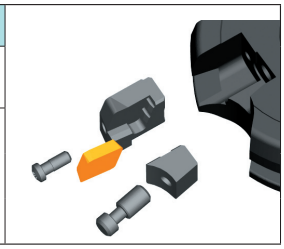




Specification of tools · Werkzeug Beschreibung

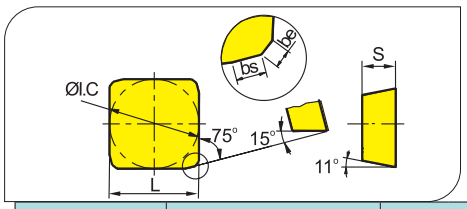
Type · Typ		Stock Lager		Dimension (mm) Abmessung					No. of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)
		R	L	Ø D	Ø D1	Ø D	L	apmax			
FME03	**-080-A27-SP12-04**	○	○	80	84	27	50	6	4	A	1.1
	-100-B32-SP12-06	○	○	100	104	32	50	6	6	B	1.9
	-125-B40-SP12-08	○	○	125	129	40	63	6	8	B	3.5
	-160-B40-SP12-10	○	○	160	164	40	63	6	10	B	5.7
	-200-C60-SP12-12	○	○	200	203	60	63	6	12	C	8.2
	-250-C60-SP12-16	○	○	250	253	60	63	6	16	C	13.8
	-315-D60-SP12-20	○	○	315	318	60	70	6	20	D	23.5
	-080-A27-SP15-04	○	○	80	84	27	50	8	4	A	1.0
	-100-B27-SP15-06	○	○	100	104	27	50	8	6	B	1.8
	-125-B40-SP15-08	○	○	125	129	40	63	8	8	B	3.3
	-160-B40-SP15-10	○	○	160	164	40	63	8	10	B	5.4
	-200-C60-SP15-12	○	○	200	204	60	63	8	12	C	7.9
	-250-C60-SP15-16	○	○	250	253	60	63	8	16	C	13.6
	-315-D60-SP15-20	○	○	315	318	60	70	8	20	D	23.1

Spare Parts · Ersatzteile

Diameter Durchmesser Ø D	Insert Platte	Cassette Kassette	Wedge Keil	Screw Schraube	Locator screw Schraube	Wrench Schlüssel	
							
Ø80-Ø100	SP12	LSP12R/L	W04R/L	WM8×17	LOM5×15.1	WT20T WT25T	
Ø125-Ø315				WM8×22			
Ø80-Ø315	SP15	LSP15R/L	W04R/L	WM8×22			

● Ex Stock / ab Lager ○ On demand / auf Anfrage

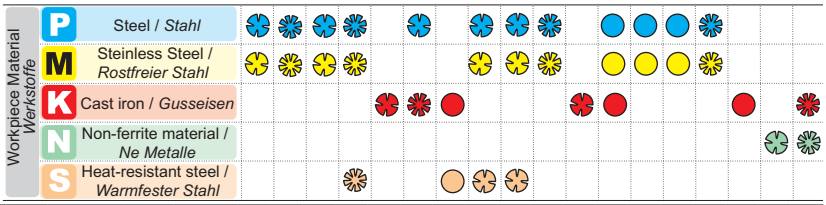
Applicable inserts · Wendeschneidplatten



Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen



Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	I.C	S	be	bs	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SPKN1203EDER	12.7	12.7	3.18	1	1.4																		
	SPKN1203EDEL	12.7	12.7	3.18	1	1.4																		
	SPKN1203EDFR (SPKN1203EDR)	12.7	12.7	3.18	1	1.4																	○	●
	SPKN1203EDFL (SPKN1203EDL)	12.7	12.7	3.18	1	1.4																		●
	SPKN1203EDSKR (SPKN1203EDR)	12.7	12.7	3.18	1	1.4	●						●	●		●					●			
	SPKN1203EDSKL (SPKN1203EDL)	12.7	12.7	3.18	1	1.4								●							●			
	SPKN1203EDTKR (SPKN1203EDTR)	12.7	12.7	3.18	1	1.4																		
	SPKN1203EDTKL	12.7	12.7	3.18	1	1.4																		
	SPKN1203EDS31PR (SPKN1203EDT31R)	12.7	12.7	3.18	1	1.4								○										
	SPKN1203EDS31PL (SPKN1203EDT31L)	12.7	12.7	3.18	1	1.4																		
	SPKN1204EDFL (SPKN1204EDL)	12.7	12.7	4.76	1	1.4																		○
	SPKN1204EDER (SPKN1204EDR)	12.7	12.7	4.76	1	1.4	●	●													○			
	SPKN1204EDFR	12.7	12.7	4.76	1	1.4																		○
	SPKN1504EDER	15.875	15.875	4.76	1	1.4																		
	SPKN1504EDEL	15.875	15.875	4.76	1	1.4																		
	SPKN1504EDFR (SPKN1504EDR)	15.875	15.875	4.76	1	1.4																		●
	SPKN1504EDFL (SPKN1504EDL)	15.875	15.875	4.76	1	1.4																		●
	SPKN1504EDSKR (SPKN1504EDR)	15.875	15.875	4.76	1	1.4	●							●							●			
	SPKN1504EDSKL (SPKN1504EDL)	15.875	15.875	4.76	1	1.4															●			
	SPKN1504EDTKR (SPKN1504EDR)	15.875	15.875	4.76	1	1.4							●											
	SPKN1504EDTKL	15.875	15.875	4.76	1	1.4																		
	SPKN1504EDS32PR (SPKN1504EDT32R)	15.875	15.875	4.76	1	1.4								●										
	SPKN1504EDS32PL (SPKN1504EDTL)	15.875	15.875	4.76	1	1.4																		
	SPKN1504EDT32PR (SPKN1504EDTR)	15.875	15.875	4.76	1	1.4	●																	
	SPKN1504EDT32PL (SPKN1504EDTL)	15.875	15.875	4.76	1	1.4																		
	SPKN1904EDFL (SPKN1904EDL)	19.05	19.05	4.76	1	1.4																		
	SPKN1904EDFR (SPKN1904EDR)	19.05	19.05	4.76	1	1.4																		

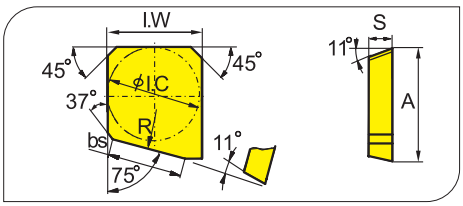
Applicable tool D14-D18
Tools code key B20-B21
Grade selection guide B15-B19
Technical data B164-B170

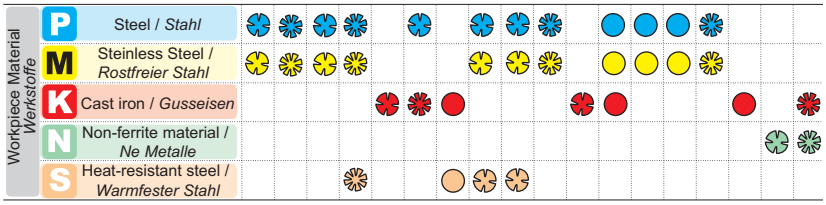
Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen

Applicable inserts · Wendeschneidplatten





Insert shape Plattenform	Type · Typ	Dimension (mm) Abmessung						CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		A	I.C	I.W	S	bs	R	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**SPEX1203EDL-1**	15	12.7	12.7	3.18	10	500																		○
	SPEX1203EDR-1	15	12.7	12.7	3.18	10	500																		○
	SPEX1504EDL-1	18.2	15.875	15.875	4.76	10	500																		○
	SPEX1504EDR-1	18.2	15.875	15.875	4.76	10	500																		○

Edge preperation for FME03
Schneidkantenausführung für FME03

Edge preperation Schneidkantenausführung	Recommended selection · Beschreibung
SPEDER/L**	Honing edge is suitable for semi-finish and finish machining steel and stainless steel. Verrundete Schneidkante für mittlere bis Schlichtbearbeitung von Stahl und rostfreiem Stahl.
SPEDFR/L**	Sharp cutting edge is suitable for finish machining cast iron materials. Scharfe Schneidkante für die Schlichtbearbeitung von Gussmaterial.
SPEDSKR/L** **SP**EDS**R/L**	After chamfering and honing, the edge has strong capability of anti-breakage, suitable for rough machining steel parts in poor conditions. Gefaste Schneidkante mit Verrundung und guter Stabilität. Für Schruppbearbeitung von Stahl auch bei ungünstigen Verhältnissen.
SPEDTKR/L** **SP**EDT**R/L**	Chamfering edge is suitable for semi-finish and finish machining steel, stainless steel and cast iron materials. Gefaste Schneide für mittlere bis Schlichtbearbeitung von Stahl und rostfreiem Stahl sowie Guss.
SPEDR/L-GM**	3D chipbreaker to reduce cutting force, reinforce the capability of chip control, improve insert life. Widely applied for semi-finish machining steel, stainless steel and cast iron materials. 3-D Spanbrecher für weniger Schnittkräfte, für gute Spankontrolle und höhere Standzeiten. Großer Anwendungsbereich bei der mittlere Bearbeitung von Stahl, rostfreiem Stahl und Guss.

● Ex Stock / ab Lager ○ On demand / auf Anfrage

Recommended cutting data · Empfohlene Schnittdaten

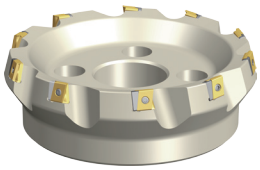
Workpiece material Werkstückstoff		Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten	
				V (m/min)	f (mm/z)
P	Low-carbon steel Soft steel Niedrig legierter Kohlenstoffstahl Baustahl	≤180	YBG202 YBG205	270(200-360)	0.2 (0.1-0.4)
			YBG302	230 (170-350)	0.24 (0.1-0.3)
			YBM251 YBC301	270(220-350)	0.2 (0.1-0.4)
			YBM351	220 (180-300)	0.25 (0.15-0.3)
			YC30S	140 (100-220)	0.22 (0.1-0.3)
	High-carbon steel Alloy steel Hoch Leg. Kohlenstoffstahl	180-280	YBG202 YBG205	240 (180-350)	0.2 (0.1-0.3)
			YBG302	220 (150-330)	0.24 (0.1-0.3)
			YBM251 YBC301	240 (200-320)	0.2 (0.1-0.4)
			YBM351	200 (160-280)	0.25 (0.15-0.3)
			YC30S	120 (80-200)	0.22 (0.1-0.3)
	Alloy tool steel Leg. Werkzeugstahl	280-350	YBG202 YBG205	220 (170-340)	0.2 (0.1-0.3)
			YBG302	190 (130-300)	0.24 (0.1-0.3)
			YBM251 YBC301	220 (180-300)	0.2 (0.1-0.4)
			YBM351	180 (150-250)	0.25 (0.15-0.3)
			YC30S	100 (60-180)	0.22 (0.1-0.3)
M	Stainless steel Rostfreier Stahl	≤270	YBG202 YBG205	160 (110-270)	0.2 (0.1-0.3)
			YBG302	140 (100-250)	0.24 (0.1-0.3)
			YBM251	150 (120-240)	0.2 (0.1-0.4)
			YBM351	140 (100-240)	0.25 (0.15-0.3)
K	Cast iron Gusseisen	180-250	YBG102	210 (120-300)	0.12 (0.08-0.3)
			YBG302	160 (120-200)	0.2 (0.1-0.3)
			YD201	100 (80-160)	0.24 (0.15-0.4)

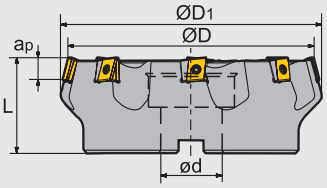
Applicable tool B9-B15
Werkzeug
Tools code key B24-B25
Werkzeug ISO
Grade selection guide B17-23
Sortenauswahl
Technical data B182-B188
Technische Daten

Face Milling Tools · Planfräser

Kr:75°

FME04 P M K





New
NEU

Specification of tools · Werkzeug Beschreibung

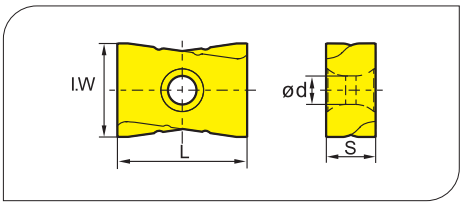
Type · Typ		Stock Lager R	Stock Lager L	Dimension (mm) Abmessung Ø D	Ø D1	Ø D	L	apmax	No. of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)
FME04	-125-B40-LN15-06	●	○	125	137	40	63	8	6	B	3.8
	-160-B40-LN15-08	●	○	160	170	40	63	8	8	C	6.6
	-200-C60-LN15-10	●	○	200	208	60	70	8	10	C	9.6
	-250-C60-LN15-12	●	○	250	257	60	70	8	12	C	13.4
	-315-D60-LN15-16	○	○	315	328	60	80	8	16	D	25.2

Spare Parts · Ersatzteile

Diameter Durchmesser Ø D	Shim Unterlage	Wedge Keil	Screw Schraube	Wrench Schlüssel
				
Ø80 Ø100	LLN15-ZR	I60M3×7	I60M4×15	WT15IS WT10IS
Ø125 ~ Ø315				

● Ex Stock / ab Lager ○ On demand / auf Anfrage

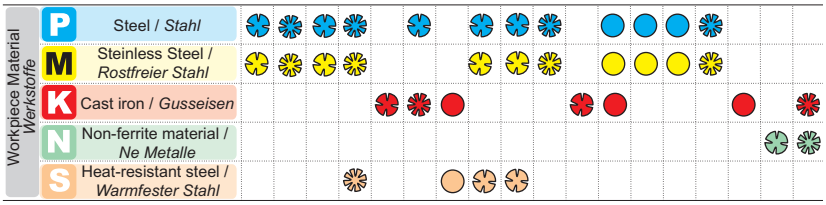
Applicable inserts · Wendeschneidplatten



Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen



Insert shape Plattenform	Type · Typ	Dimension (mm) Abmessung L	l.W	S	d		CVD Coating CVD Beschicht. YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	PVD Coating PVD Beschicht. YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	Cermet YNG151	YNG151C	Carbide uncoat. unbe. Hartmetall YC30S	YD051	YD101	YD201
	**LNKT1506EN-ZR**	15.875	14	6.35	4.6		●		●	●	●	●				●								

Recommended cutting data · Empfohlene Schnittdaten

Workpiece material		Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten V (m/min)	f (mm/z)
P	Low-carbon steel Soft steel	≤180	YBG302	180 (150-300)	0.5 (0.2-0.8)
			YBM351	180 (150-300)	0.5 (0.2-0.8)
	High-carbon steel Alloy steel	180-280	YBG302	150 (120-280)	0.5 (0.2-0.8)
			YBM351	140 (120-280)	0.5 (0.2-0.8)
	Alloy tool steel Leg. Werkzeugstahl	280-350	YBG302	120 (80-250)	0.45 (0.2-0.6)
			YBM351	100 (80-250)	0.45 (0.2-0.6)
M	Stainless steel Rostfreier Stahl	≤270	YBG302	120 (80-200)	0.45 (0.2-0.6)
			YBM351	100 (80-200)	0.45 (0.2-0.6)

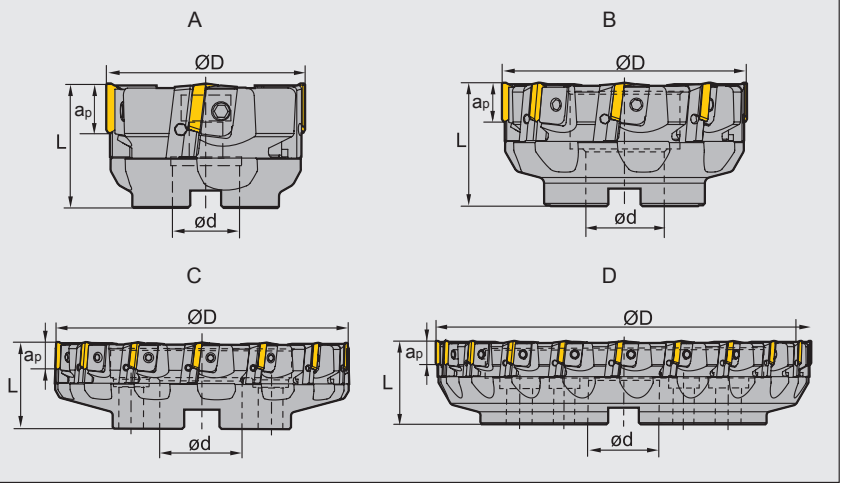
Applicable tool D14-D18
Tools code key B20-B21
Grade selection guide B15-B19
Technical data B164-B170

Face Milling Tools · Planfräser

Kr:90°

FMP01 P M K



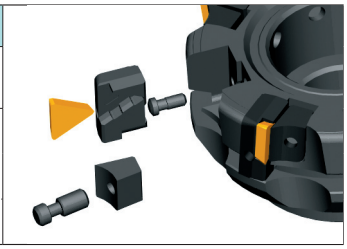


Specification of tools · Werkzeug Beschreibung

Type · Typ		Stock Lager		Dimension (mm) Abmessung				No. of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)
		R	L	Ø D	Ø D	L	$a_p$max			
FMP01	**-080-A27-TP22-04**	●	○	80	27	50	18	4	A	1.2
	-100-B32-TP22-06	●	○	100	32	50	18	6	B	1.7
	-125-B40-TP22-08	●	○	125	40	63	18	8	B	3.2
	-160-B40-TP22-10	●	○	160	40	63	18	10	B	5.1
	-200-C60-TP22-12	●	○	200	60	63	18	12	C	7.4
	-250-C60-TP22-16	○	○	250	60	63	18	16	C	12.3
	-315-D60-TP22-20	○	○	315	60	70	18	20	D	21.9

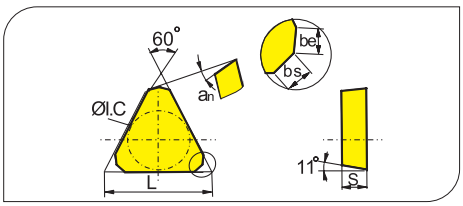
Spare Parts · Ersatzteile

Diameter Durchmesser Ø D	Cassette Kassette	Wedge Keil	Screw Schraube	Locator screw Schraube	Wrench Schlüssel
Ø80 Ø100	LTP4R1/L1	W04R/L	WM8×17	LOM5×15.1	WT20T WT25T
Ø125 ~ Ø315	LTP4R/L		WM8×22		



● Ex Stock / ab Lager ○ On demand / auf Anfrage

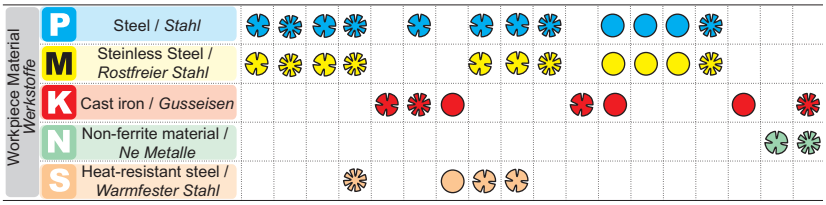
Applicable inserts · Wendeschneidplatten



Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen



Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen						CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	I.C	S	be	bs	an	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**TPKN1603PDSKR** (TPKN1603PDR)	16.5	9.525	3.18	1.2	1	15°	●	●	○	○			○	●	●	○					●			
	TPKN1603PDSKL (TPKN1603PDL)	16.5	9.525	3.18	1.2	1	11°																		
	TPKN1603PPER (TPKN1603PPR)	16.5	9.525	3.18	1.2	1	11°	●	○													●			
	TPKN1603PPFR (TPKN1603PPR)	22	12.7	4.76	1.4	0.7	11°							○											●
	TPKN2204PDSKR (TPKN2204PDR)	22	12.7	4.76	1.4	0.7	11°	●	●					●	●	●	○					●			
	TPKN2204PDS22PL (TPKN2204PDL)	22	12.7	4.76	1.4	0.7	11°	●														●			
	TPKN2204PDS41PR (TPKN2204PDTR)	22	12.7	4.76	1.4	0.7	11°	○							○							●			

(old Material No. / alte Artikelnr.)

Recommended cutting data · Empfohlene Schnittdaten

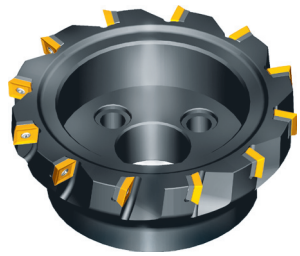
Workpiece material Werkstückstoff		Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten	
				V (m/min)	f (mm/z)
P	Low-carbon steel Soft steel Niedrig legierter Kohlenstoffstahl Baustahl	≤180	YBC301	270 (220-350)	0.2 (0.1-0.4)
			YBM351	220 (180-300)	0.2 (0.08-0.3)
			YBG202	270 (200-360)	0.2 (0.1-0.3)
			YC30S	140 (100-220)	0.22 (0.1-0.3)
	High-carbon steel Alloy steel Hoch Leg. Kohlenstoffstahl	180—280	YBC301	240 (200-320)	0.2 (0.1-0.4)
			YBM351	200 (160-280)	0.2 (0.08-0.3)
			YBG202	240 (180-350)	0.2 (0.1-0.3)
			YC30S	120 (80-200)	0.22 (0.1-0.3)
	Alloy tool steel Leg. Werkzeugstahl	280—350	YBC301	220 (180-300)	0.2 (0.1-0.4)
			YBM351	180 (150-250)	0.2 (0.08-0.3)
			YBG202	220 (170-340)	0.2 (0.1-0.3)
			YC30S	100 (60-180)	0.22 (0.1-0.3)
M	Stainless steel Rostfreier Stahl	≤270	YBM351	140 (100-240)	0.2 (0.08-0.3)
			YBG202	140 (100-250)	0.2 (0.1-0.3)
K	Cast iron Gusseisen	180—250	YBG102	210 (120-300)	0.2 (0.1-0.3)
			YBG302	160 (120-200)	0.35 (0.10-0.4)
			YD201	100 (80-160)	0.24 (0.15-0.4)

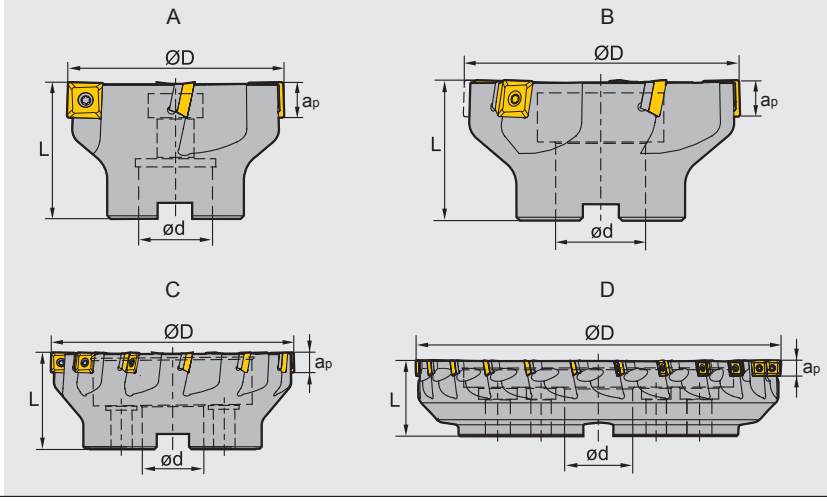
Applicable tool D14-D18
Tools code key B20-B21
Grade selection guide B15-B19
Technical data B164-B170

Face Milling Tools · Planfräser

Kr:90°

FMP02 P M K





Specification of tools · Werkzeug Beschreibung

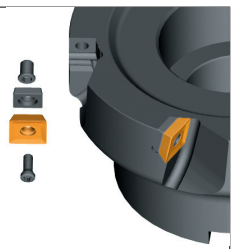
Type · Typ		Stock Lager	Dimension (mm) Abmessung				No. of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)
			Ø D	Ø D	L	a_{pmax}			
FMP02	**-050-A22-SE09-05**	●	50	22	40	6.7	5	A	0.3
	-063-A22-SE09-06	●	63	22	40	6.7	6	A	0.5
	-080-A27-SE09-08	●	80	27	50	6.7	8	A	0.9
	-100-B32-SE09-08	○	100	32	50	6.7	8	B	1.7
	-100-B32-SE09-10	○	100	32	50	6.7	10	B	1.7
	-125-B40-SE09-12	○	125	40	63	6.7	12	B	2.6

● Ex Stock / ab Lager ○ On demand / auf Anfrage

Specification of tools · Werkzeug Beschreibung

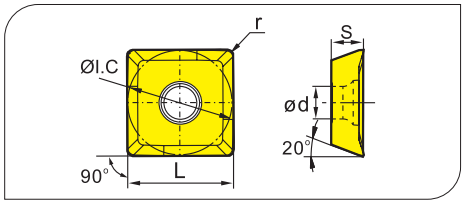
Type · Typ		Stock Lager	Dimension (mm) Abmessung				No. of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)
			Ø D	Ø D	L	a_{pmax}			
FMP02	**-050-A22-SE12-03**	○	50	22	40	10.8	3	A	0.3
	-063-A22-SE12-04	○	63	22	40	10.8	4	A	0.4
	-080-A27-SE12-04	○	80	27	50	10.8	4	A	0.9
	-100-B32-SE12-05	○	100	32	50	10.8	5	B	1.2
	-125-B40-SE12-06	○	125	40	63	10.8	6	B	3.1
	-160-C40-SE12-08	○	160	40	63	10.8	8	C	4.1
	-250-C60-SE12-12	○	250	60	63	10.8	12	C	11.1
	-050-A22-SE12-04	●	50	22	40	10.8	4	A	0.3
	-063-A22-SE12-05	●	63	22	40	10.8	5	A	0.4
	-080-A27-SE12-06	●	80	27	50	10.8	6	A	0.8
	-100-B32-SE12-07	●	100	32	50	10.8	7	B	1.2
	-125-B40-SE12-08	●	125	40	63	10.8	8	B	3.0
	-160-C40-SE12-12	●	160	40	63	10.8	12	C	3.9
	-050-A22-SE12-05	●	50	22	40	10.8	5	A	0.2
	-063-A22-SE12-06	●	63	22	40	10.8	6	A	0.4
	-080-A27-SE12-08	●	80	27	50	10.8	8	A	0.8
	-100-B32-SE12-10	●	100	32	50	10.8	10	B	1.2
	-125-B40-SE12-12	●	125	40	63	10.8	12	B	2.9
	-200-C60-SE12-16	●	200	60	63	10.8	16	C	6.1
	-250-C60-SE12-18	●	250	60	63	10.8	18	C	10.9
	-315-D60-SE12-24	○	315	60	63	10.8	24	D	21.6

Spare Parts · Ersatzteile

Diameter Durchmesser Ø D	Insert Platte	shim Unterlage	Screw Schraube	shim Unterlage Screw Schraube	Wrench Schlüssel	Wrench Schlüssel	
							
Ø50 ~ Ø125	SE09	--	I60M3×7	--	WT09IS	--	
Ø50	SE12	--	I60M3.5×10	--	WT15IS	--	
Ø63 ~ Ø315		S12BSX	I60M3.5×12	SM5×7XA		WH35L	

Applicable tool Werkzeug B9-B15
Tools code key Werkzeug ISO B24-B25
Grade selection guide Sortenauswahl B17-23
Technical data Technische Daten B182-B188

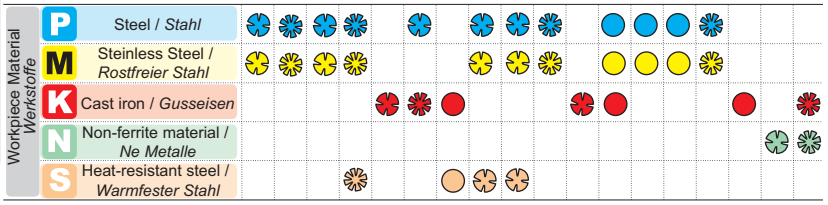
Applicable inserts · Wendeschneidplatten



Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen



Insert shape Plattenform	Type · Typ	Dimension (mm) Abmessung					CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	I.C	S	d	r	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**SEET09T308PER-PF**	9.525	9.525	4.01	3.3	0.8								●										
	**SEET09T308PER-PM**	9.525	9.525	4.01	3.3	0.8								●										
	**SEET09T308PER-PR**	9.525	9.525	4.01	3.3	0.8					●													
	**SEET120308PER-PF**	13.308	13.308	4.04	4.1	0.8	●			●				●										
	**SEET120308PER-PM**	13.308	13.308	4.04	4.1	0.8			●	●	●	●	●	●		●								
	**SEET120308PER-PR**	13.308	13.308	4.04	4.1	0.8			●	●		●	○	○										
	**SEET120308-LH**	13.308	13.308	4.04	4.1	0.8							●										●	

Chipbreaker Selektion FMP02 · Spanbrecher Auswahl FMP02

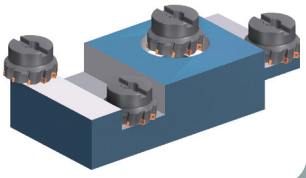
Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	Roughing Schruppen
P	PF 	PM 	PR 
M			
K			
N	LH		

● Ex Stock / ab Lager ○ On demand / auf Anfrage

Features of FMP02 series milling cutters
Merkmale des Frässystems

High economical efficiency

Hohe wirtschaftliche Effizienz

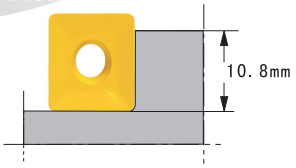


FMP02 series square shoulder mills can carry out a variety of cutting operations including face, vertical square shoulder, slot etc. Coarse pitch, close pitch and extra close pitch, each has a unique merit. Inserts' chipbreakers and grades are applied and optimized for a long tool life, they can achieve high efficiency machining in different condition. Each insert has 4 cutting edge, high economical efficiency.

Das universelle Frässystem FMP02 wird für unterschiedliche Fräsoperationen eingesetzt, z.B. Planfräsen, Eckfräsen, Nutenfräsen etc.
Fräser mit weiter, enger und extraenger Teilung , Wendeschneidplatten in verschiedenen Sorten und Spanbrechern ermöglichen eine optimale Bearbeitung mit hoher Wirtschaftlichkeit; jede Wendeschneidplatte hat 4 Schneidkanten.

High productivity

Hohe Produktivität



The major cutting edge is a α-curve, therefore the S Type inserts makes the tool obtain a ideal 90° approach angle while the minor cutting edge angle is enough. It ensures stable cutting operation. The maximum cutting depth can reach 10.8 mm, and the maximum feed rate can reach 0.3mm/z

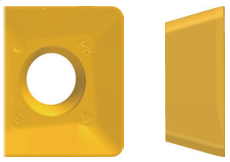
Die Hauptschneide ist wellenförmig ausgebildet, erzielt einen idealen 90 Grad Einstellwinkel und eine stabile Bearbeitung. Die maximale Schnitttiefe beträgt 10,8 mm bei einem maximalen Vorschub von 0,3 mm/z.

Less cutting force

Geringe Schnittkräfte

Large positive rake angle design makes cutting light and fast.

Großer positiver Spanwinkel für leichte und schnelle Bearbeitung.





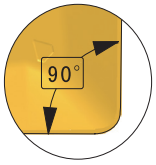
Simple screw clamping, inserts displacement is convenient. The chip pocket of rake face is big enough for smooth chip removal.

Durch die Schraubenklemmung ist einfacher Schneiden- bzw. Schneidplattenwechsel gegeben.

Easy & convenient to apply
Einfacher & schneller Schneidenwechsel

High precision

Hohe Präzision



Special structure design and fine manufacture make the tools possess very high precision, greatly improve the workpiece precision and surface quality.

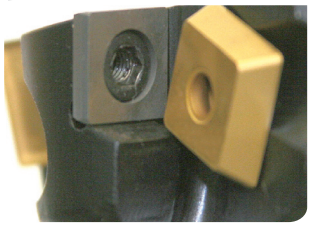
Die spezielle Konstruktion und die präzise Herstellung der Schneidplatte garantieren eine verbesserte Genauigkeit und Oberfläche des Werkstückes.

Adopting the carbide shim machined precisely to protect tool body, enable tool durable and long life.

Die präzise Hartmetall-Zwischenlage schützt den Fräskörper und bringt eine hohe Werkzeuglebensdauer.

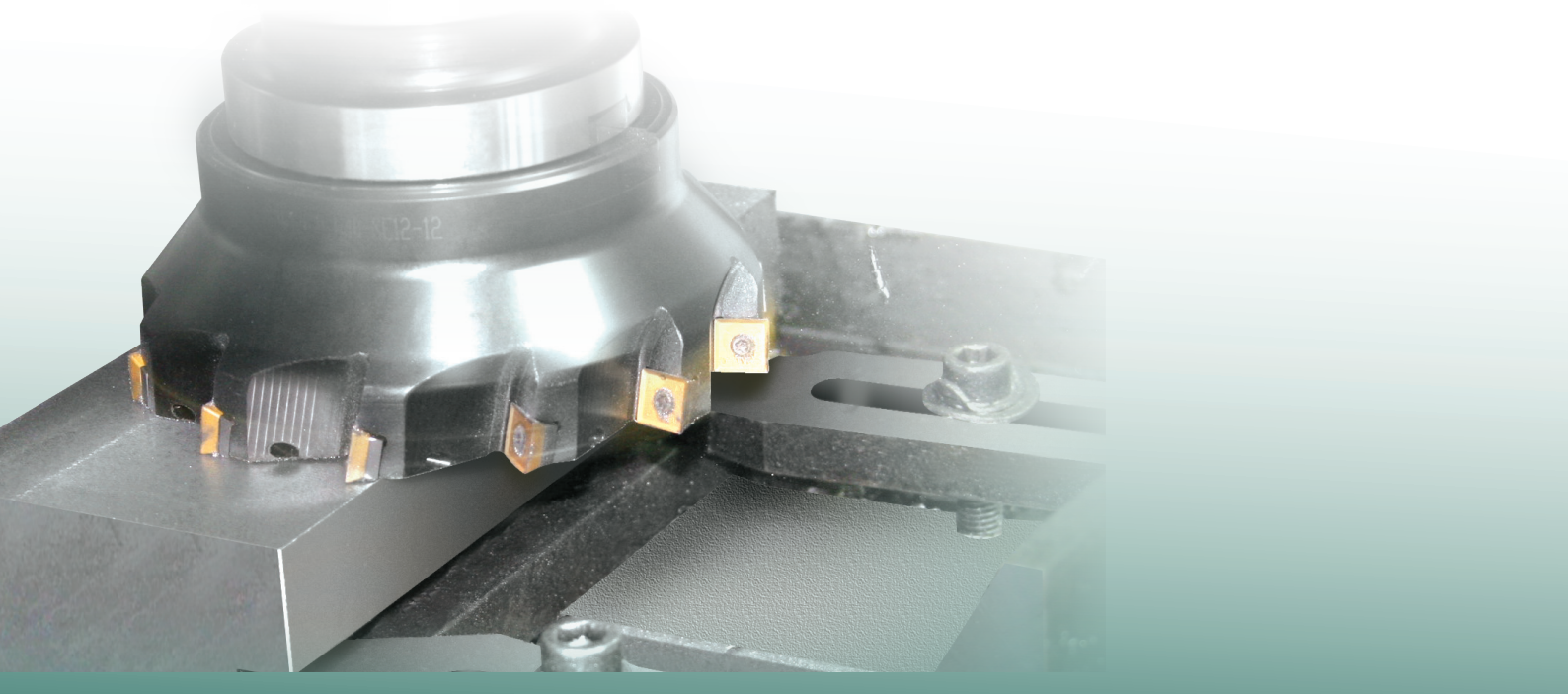
High reliability

Hohe Werkzeug-stabilität & Sicherheit

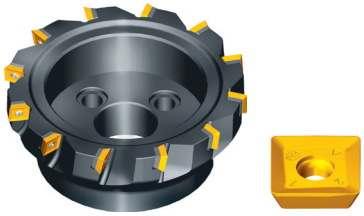


Recommended cutting data · Empfohlene Schnittdaten

Workpiece material Werkstückstoff		Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten			
				V (m/min)	f (mm/z)		
					-PF	-PM	-PR
P	Low-carbon steel Soft steel Niedrig legierter Kohlenstoffstahl Baustahl	≤180	YBM251	270(220-350)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
			YBG202	270(200-360)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
			YBG302	230 (170-350)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
	High-carbon steel Alloy steel Hoch Leg. Kohlenstoffstahl Leg. Stahl	180—280	YBM251	240 (200-320)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
			YBG202	240 (180-350)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
			YBG302	220 (150-330)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
	Alloy tool steel Leg. Werkzeugstahl	280—350	YBM251	220 (180-300)	0.1(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
			YBG202	220 (170-340)	0.1(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
			YBG302	190 (130-300)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
M	Stainless steel Rostfreier Stahl	≤270	YBM251	150 (120-240)	0.1(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
			YBG202	160 (110-270)	0.1(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
			YBG302	140 (100-250)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
K	Cast iron Gusseisen	180—250	YBG102	210 (120-300)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
			YBG202	160 (120-200)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
			YBD252	200 (150-250)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
					-LH		
N	Al alloy leg. Alu	-	YD101	300-	0.15 (0.05-0.3)		



Case study for FMP02
Bearbeitungsbeispiel für FMP02

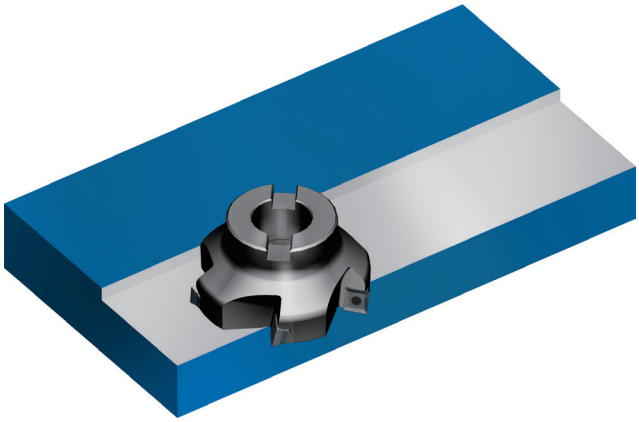


■ Tool · Werkzeug: FMP02-100-B32-SE12-054
■ Inserts · WSP: SEET120308PER-PM/YBD252

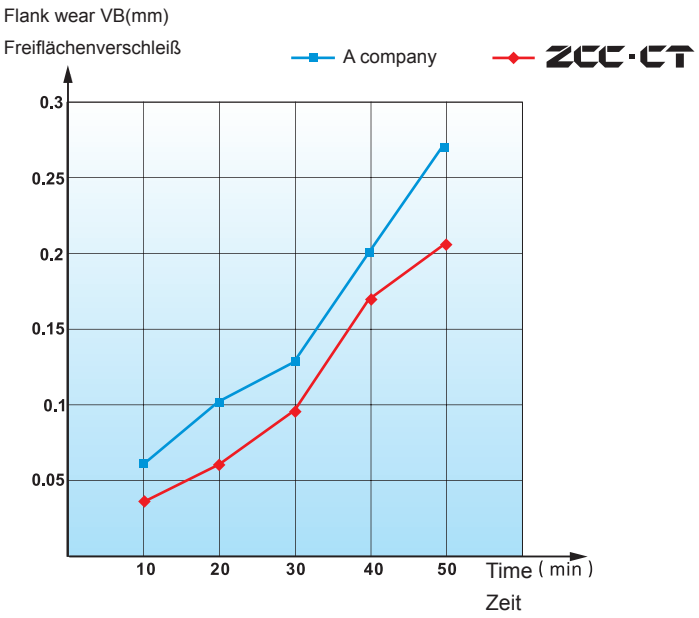
Workpiece material
Werkstückstoff: HT300/ GG30 (HB150)
Cooling system
Kühlsystem: dry cutting, trocken

Machine: vertical machining center
Maschine: vertikales Maschinencenter

Cutting data
Schnittdaten:
Vc=200m/min
ap=3mm
fz=0.2mm/z
ae=80mm



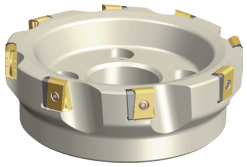
● Wear comparison of insert.
● Verschleißvergleich der WSP.

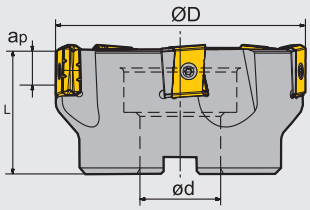


Face Milling Tools · Planfräser

Kr:90°

FMP03 P M K

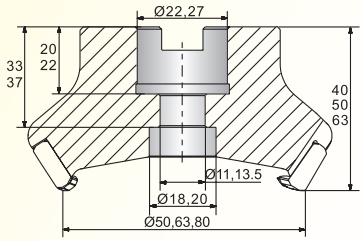




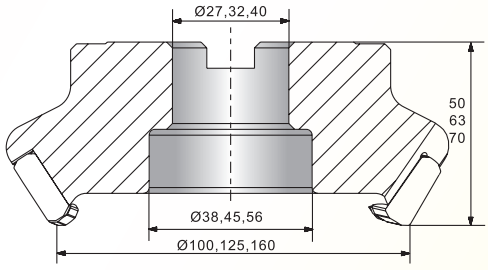
New NEU

Type · Typ		Stock Lager R	Stock Lager L	Ø D	Ø D	L	a_{pmax}	No. of teeth Zähne	Insert · WSP	Coupling Aufnahme	Weight Gewicht (kg)
FMP03	**-125-B40-LN15-06**	●	○	125	40	63	8	6		B	3.2
	-160-C40-LN15-08	●	○	160	40	63	8	8		C	5.1
	-200-C60-LN15-10	●	○	200	60	70	8	10	LNKT1506EN-ZR	C	7.5
	-250-C60-LN15-12	●	○	250	60	70	8	12		C	12.2
	-315-D60-LN15-16	●	○	315	60	80	8	16		D	23.7
	-125-B40-LN20-06	○	○	125	40	63	12	6		B	3.3
	-160-C40-LN20-08	●	○	160	40	63	12	8		C	5.3
	-200-C60-LN20-10	●	○	200	60	70	12	10	LNKT2007DN-ZR	C	8.8
	-250-C60-LN20-12	●	○	250	60	70	12	12		C	14.0
	-315-D60-LN20-15	○	○	315	60	80	12	15		D	23.9
	-125-B40-LN25-05	●	○	125	40	63	15	5		B	3.3
	-160-C40-LN25-06	●	○	160	40	63	15	6		C	5.1
	-200-C60-LN25-08	●	○	200	60	70	15	8	LNKT2510-ZR	C	8.9
	-250-C60-LN25-10	●	○	250	60	70	15	10		C	12.0
	-315-D60-LN25-12	●	○	315	60	80	15	12		D	21.9

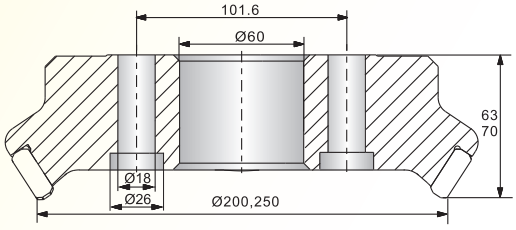
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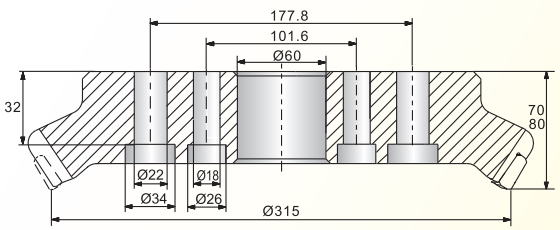
B



C



D

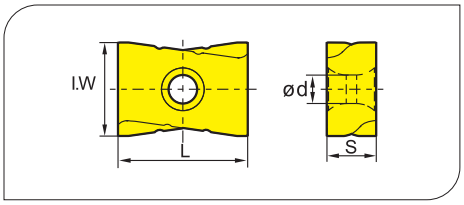


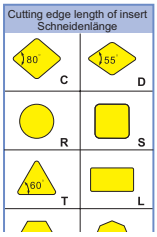
● Ex Stock / ab Lager ○ On demand / auf Anfrage

Spare Parts · Ersatzteile

Diameter Durchmesser Ø D	Insert Platte	shim Unterlage	Screw Schraube	Shim Screw Unterlage Schraube	Wrench Schlüssel	Wrench Schlüssel
						
Ø125 ~ Ø315	LN15	LLN15-ZR	I60M3×7	I60M4×15	WT15IS	WT10IS
Ø125 ~ Ø315	LN20	LLN20R-ZR	I60M3×7	I60M4×15	WT15IS	WT10IS
Ø125 ~ Ø315	LN25	LLN25R-ZR	I60M3.5×10.4	I60M5×17	WT20IT	WT15IS

Applicable inserts · Wendeschneidplatten





Insert clearance angle Freiwinkel der Platten	
N	0°
B	5°
C	7°
P	11°
D	15°
E	20°

Cutting edge length of insert Schneidenlänge

Diameter Durchmesser	Insert Shape / Plattenform C	D	R	S	T	L
5.556	—	—	—	—	09	—
6.350	06	07	—	—	11	—
9.525	09	11	09	09	16	—
12.700	12	15	12	12	22	—
15.875	16	19	15	15	27	—
19.050	19	—	19	19	33	—

Insert shape Plattenform	Type · Typ	Dimension (mm) Abmessung				CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	I.W	S	d	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**LNKT1506EN-ZR**	15.875	14	6.35	4.6	●		●	●	●	●				●								
	LNKT2007DN-ZR	20	17	7.94	4.6				●		●				●								
	LNKT2510-ZR	25	18	9.525	5.5				●		●				●								

Recommended cutting data · Empfohlene Schnittdaten

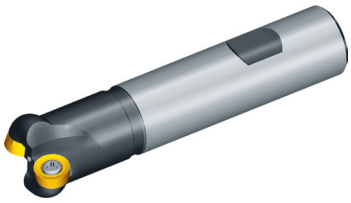
Workpiece material Werkstückstoff		Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten	
				V (m/min)	f (mm/z)
P	Low-carbon steel Soft steel Niedrig legierter Kohlenstoffstahl Baustahl	≤180	YBG302	180 (150-300)	0.5 (0.2-0.8)
			YBM351	180 (150-300)	0.5 (0.2-0.8)
	High-carbon steel Alloy steel Hoch Leg. Kohlenstoffstahl Leg. Stahl	180-280	YBG302	150 (120-280)	0.5 (0.2-0.8)
			YBM351	140 (120-280)	0.5 (0.2-0.8)
	Alloy tool steel Leg. Werkzeugstahl	280-350	YBG302	120 (80-250)	0.45 (0.2-0.6)
			YBM351	100 (80-250)	0.45 (0.2-0.6)
M	Stainless steel Rostfreier Stahl	≤270	YBG302	120 (80-200)	0.45 (0.2-0.6)
			YBM351	100 (80-200)	0.45 (0.2-0.6)

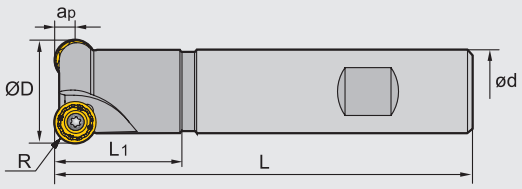
Applicable tool B9-B15
Werkzeug
Tools code key B24-B25
Werkzeug ISO
Grade selection guide B17-23
Sortenauswahl
Technical data B182-B188
Technische Daten

Face Milling Tools · Planfräser



FMR01 P M K



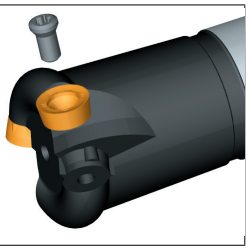


Specification of tools · Werkzeug Beschreibung

Type · Typ		Stock Lager	Dimension (mm) Abmessung						No. of teeth Zähne	Weight Gewicht (kg)
			Ø D	Ø D	L	L_1	R	a_{pmax}		
FMR01	**-025-XP20-RC10-02**	●	25	20	100	30	5	5	2	0.2
	-032-XP25-RC10-02	●	32	25	120	35	5	5	2	0.5
	-040-XP32-RC12-03	●	40	32	120	40	6	6	3	0.7
	-050-XP32-RC12-03	●	50	32	120	40	6	6	3	0.8

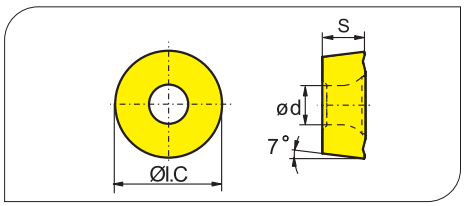
Spare Parts · Ersatzteile

Diameter Durchmesser Ø D	Wrench Schlüssel	Wrench Schlüssel
		
Ø25 -Ø32	I60M4×8.4	WT15S
Ø40 -Ø50	I60M3.5×10	



● Ex Stock / ab Lager ○ On demand / auf Anfrage

Applicable inserts · Wendeschneidplatten

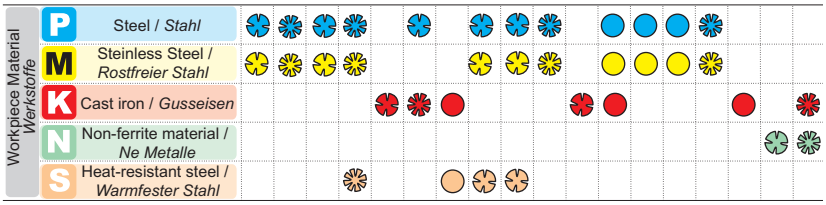


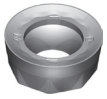
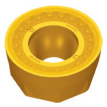
Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen

Workpiece Material *Werkstoffe*



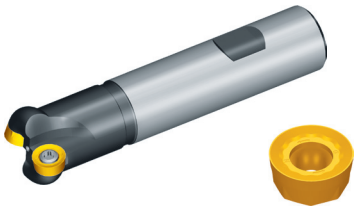
Insert shape Plattenform	Type · Typ	Dimension (mm) Abmessung				CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		R	I.C	S	d	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**RCKT10T3MO-DM**	5	10.0	3.97	4.4	●	●								○								
	**RCKT1204MO-DM**	6	12.0	4.76	4.0	●	●	●	●	○			○										
	**RCKT1204MO-DR**	6	12.0	4.76	4.0	●	●	●	●														

Recommended cutting data · Empfohlene Schnittdaten

Workpiece material Werkstückstoff		Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten		
				V (m/min)	f (mm/z)	
					-DM	-DR
P	Low-carbon steel Soft steel Niedrig legierter Kohlenstoffstahl Baustahl	≤180	YBM251 YBC301	270 (220-350)	0.2(0.1-0.5)	0.3 (0.2-0.8)
			Gusseisen	220 (180-300)	0.25(0.1-0.5)	0.3 (0.2-0.8)
			YBG202	270 (200-360)	0.2(0.1-0.5)	0.3 (0.2-0.8)
	High-carbon steel Alloy steel Hoch Leg. Kohlenstoffstahl Leg. Stahl	180-280	YBM251 YBC301	240 (200-320)	0.2(0.1-0.5)	0.3 (0.2-0.8)
			YBM351 YBG302	200 (160-280)	0.25(0.1-0.5)	0.3 (0.2-0.8)
			YBG202	240 (180-350)	0.2(0.1-0.5)	0.3 (0.2-0.8)
	Alloy tool steel Leg. Werkzeugstahl	280-350	YBM251 YBC301	220 (180-300)	0.2(0.1-0.4)	0.3 (0.2-0.6)
			YBM351 YBG302	180 (150-250)	0.2(0.1-0.5)	0.3 (0.2-0.8)
			YBG202	220 (170-340)	0.2(0.1-0.4)	0.3 (0.2-0.6)
M	Stainless steel Rostfreier Stahl	≤270	YBM251	150 (120-240)	0.2(0.1-0.4)	0.3 (0.2-0.6)
			YBM351	150 (100-220)	0.2(0.1-0.4)	0.3 (0.2-0.6)
			YBG202	160 (110-270)	0.2(0.1-0.4)	0.3 (0.2-0.6)
K	Cast iron Gusseisen	180-250	YBG302	210 (120-300)	0.2(0.1-0.5)	0.3 (0.2-0.8)

Applicable tool D14-D18
Tools code key B20-B21
Grade selection guide B15-B19
Technical data B164-B170

Case study for FMR01
Bearbeitungsbeispiel für FMR01

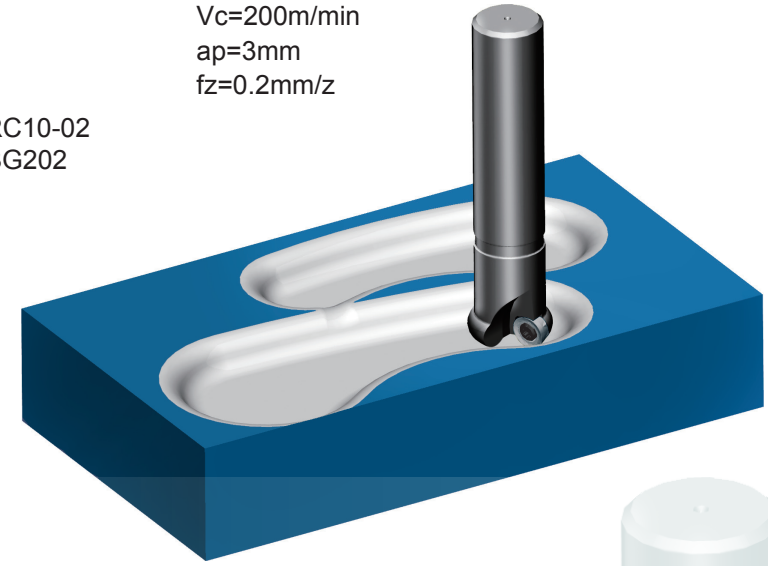


- Tool · Werkzeug: FMR01-025-XP20-RC10-02
- Inserts · WSP: RCKT10T3MO-DM/YBG202

Workpiece material
Werkstückstoff: 42CrMo (HRC35)
Cooling system
Kühlsystem: dry cutting, trocken

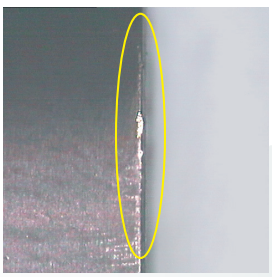
Machine: vertical machining center
Maschine: vertikales Maschinencenter

Cutting data
Schnittdaten:
Vc=200m/min
ap=3mm
fz=0.2mm/z



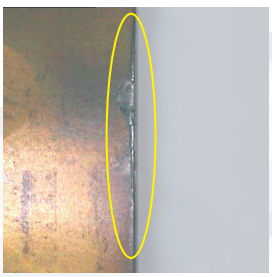
- **Wear comparison of insert.**
- **Verschleißvergleich der WSP.**

ZCC-CT



22 minutes later

Other company product



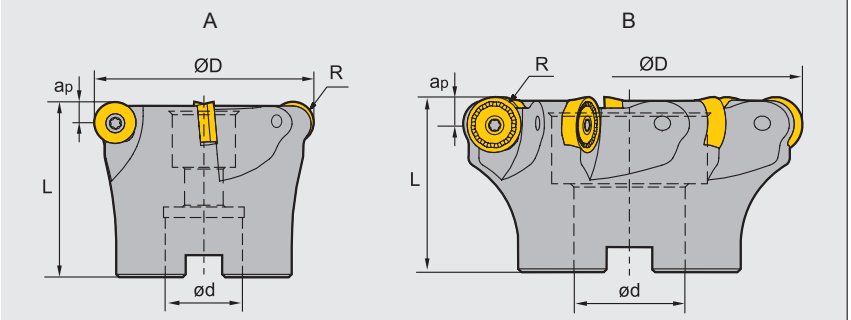
22 minutes later

Face Milling Tools · Planfräser



FMR02 P M K



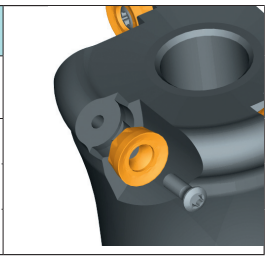


Specification of tools · Werkzeug Beschreibung

Type · Typ		Stock Lager	Dimension (mm) Abmessung Ø D	Ø D	L	R	apmax	No. of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)
FMR02	**063-A22-RC12-04**	●	63	22	50	6	6	4	A	0.7
	063-A22-RC12-04C	○	63	22	50	6	6	4	A	
	063-A22-RC12-06	●	63	22	50	6	6	6		
	063-A22-RC16-04	●	63	22	50	8	8	4		
	080-B27-RC16-05	●	80	27	50	8	8	5	B	0.7
	080-B27-RC16-05C	○	80	27	50	8	8	5	B	
	080-B27-RC20-04	○	80	27	50	10	10	4		
	100-B32-RC16-06	●	100	32	63	8	8	6	B	1.2
	100-B32-RC20-05	●	100	32	63	10	10	5		
	100-B32-RC20-06	○	100	32	63	10	10	6		
	125-B40-RC20-06	●	125	40	63	10	10	6		
	125-B40-RC20-07	●	125	40	63	10	10	7	B	2.2
	160-B40-RC20-08	●	160	40	63	10	10	8	B	4.2
	250-B40-RC20-10	○	250	40	63	10	10	10		

Spare Parts · Ersatzteile

Diameter Durchmesser Ø D	Screw Schraube	Wrench Schlüssel	
Ø63	I60M3.5×10	WT15IS	--
Ø80 -Ø100	I60M5×13	--	WT20IT
Ø125 -Ø160	I43M6×16	--	WT25IT



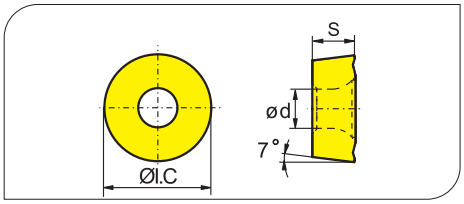
Applicable tool Werkzeug B9-B15
Tools code key Werkzeug ISO B24-B25
Grade selection guide Sortenauswahl B17-23
Technical data Technische Daten B182-B188

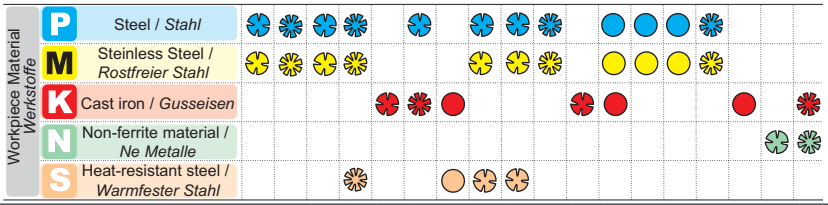
Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen

Applicable inserts · Wendeschneidplatten





Insert shape Plattenform	Type · Typ	Dimension (mm) Abmessung				CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		R	I.C	S	d	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**RCKT10T3MO-DM**	5	10.0	3.97	4.4	●	●								○								
	RCKT1204MO-DM	6	12.0	4.76	4.0	●	●	●	●				○										
	RCKT1204MO-DR	6	12.0	4.76	4.0	●	●	●	●														
	RCKT1606MO-DM	8	16	6.35	5.56	●	●	○							○								
	RCKT1606MO-DR	8	16	6.35	5.56	●	●		●		●												
	RCKT2006MO-DM	10	20	6.35	6.55	●	●																
	RCKT2006MO-DR	10	20	6.35	6.55	●	●		●		●												

Recommended cutting data · Empfohlene Schnittdaten

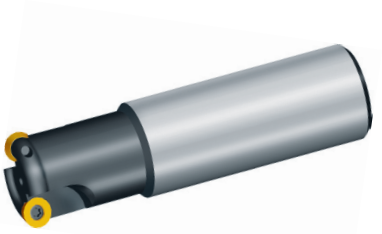
Workpiece material Werkstückstoff		Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten		
				V (m/min)	f (mm/z)	
					-DM	-DR
P	Low-carbon steel Soft steel Niedrig legierter Kohlenstoffstahl Baustahl	≤180	YBM251 YBC301	270 (220-350)	0.2(0.1-0.5)	0.3 (0.2-0.8)
			YBM351 YBG302	220 (180-300)	0.25(0.1-0.5)	0.3 (0.2-0.8)
			YBG202	270 (200-360)	0.2(0.1-0.5)	0.3 (0.2-0.8)
	High-carbon steel Alloy steel Hoch Leg. Kohlenstoffstahl	180-280	YBM251 YBC301	240 (200-320)	0.2(0.1-0.5)	0.3 (0.2-0.8)
			YBM351 YBG302	200 (160-280)	0.25(0.1-0.5)	0.3 (0.2-0.8)
			YBG202	240 (180-350)	0.2(0.1-0.5)	0.3 (0.2-0.8)
	Alloy tool steel Leg. Werkzeugstahl	280-350	YBM251 YBC301	220 (180-300)	0.2(0.1-0.4)	0.3 (0.2-0.6)
			YBM351 YBG302	180 (150-250)	0.2(0.1-0.5)	0.3 (0.2-0.8)
			YBG202	220 (170-340)	0.2(0.1-0.4)	0.3 (0.2-0.6)
M	Stainless steel Rostfreier Stahl	≤270	YBM251	150 (120-240)	0.2(0.1-0.4)	0.3 (0.2-0.6)
			YBM351	150 (100-220)	0.2(0.1-0.4)	0.3 (0.2-0.6)
			YBG202	160 (110-270)	0.2(0.1-0.4)	0.3 (0.2-0.6)
K	Cast iron Gusseisen	180-250	YBG302	210 (120-300)	0.2(0.1-0.5)	0.3 (0.2-0.8)

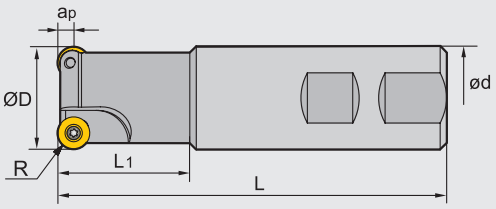
● Ex Stock / ab Lager ○ On demand / auf Anfrage

Face Milling Tools · Planfräser



FMR03 P M K



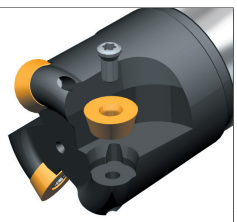


Specification of tools · Werkzeug Beschreibung

Type · Typ		Stock Lager	Dimension (mm) Abmessung						No. of teeth Zähne	Weight Gewicht (kg)
			Ø D	Ø d	L	L_1	R	a_{pmax}		
FMR03	**-016-XP16-RD08-02**	○	16	16	100	25	4	4	2	0.1
	-025-XP25-RD08-02	●	25	25	100	30	4	4	2	0.3
	-032-XP32-RD10-02	●	32	32	120	40	5	5	2	0.7
	-040-XP32-RD12-03	●	40	32	120	40	6	6	3	0.7
	-050-XP32-RD12-04	●	50	32	120	40	6	6	4	0.8

Spare Parts · Ersatzteile

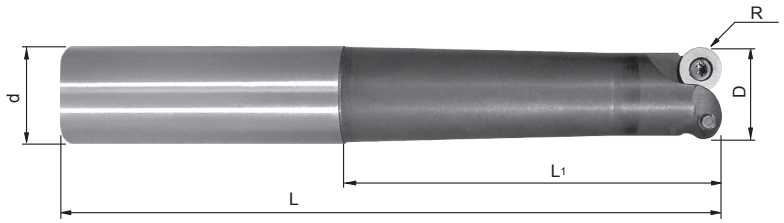
Diameter Durchmesser Ø D	Screw Schraube	Wrench Schlüssel
		
Ø25	I60M3×7	WT09IP
Ø32-Ø50	I60M4×10	WT15IP



Applicable tool B9-B15
Werkzeug
Tools code key B24-B25
Werkzeug ISO
Grade selection guide B17-23
Sortenauswahl
Technical data B182-B188
Technische Daten

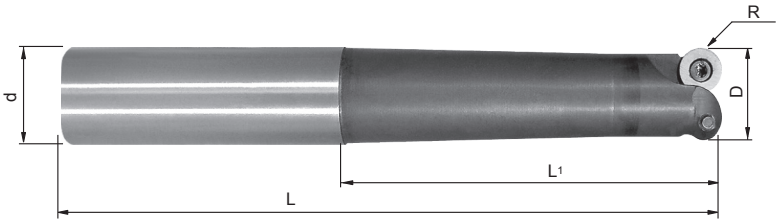
Face Milling Tools · Planfräser

FMR03 P M K



Type · Typ		Stock Lager	Dimension (mm) Abmessung						No. of teeth Zähne
			Ø D	Ø d	L	L1	R	apmax	
FMR03	**-015-G16-XS RD0702-02**	○	15	16	88	40	3.5	3.5	2
	-015-G16-S RD0702-02	○	15	16	108	60	3.5	3.5	2
	-015-G20-M RD0702-02	○	15	20	130	80	3.5	3.5	2
	-015-G20-L RD0702-02	○	15	20	150	100	3.5	3.5	2
	-015-G25-XL RD0702-02	○	15	25	120	176	3.5	3.5	2

Inserts · WSP: RDKW0702MO**/ RDKW1003MO**



Type · Typ		Stock Lager	Dimension (mm) Abmessung						No. of teeth Zähne
			Ø D	Ø d	L	L1	R	apmax	
FMR03	**-020-G20-XS RD1003-02**	○	20	20	90	40	5	5	2
	-020-G20-S RD1003-02	○	20	20	110	60	5	5	2
	-020-G25-M RD1003-02	○	20	25	136	80	5	5	2
	-020-G25-L RD1003-02	○	20	25	156	100	5	5	2
	-020-G25-XL RD1003-02	○	20	25	176	120	5	5	2

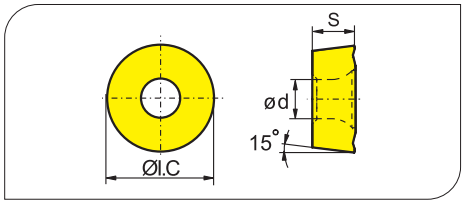
Inserts · WSP: RDKW0702MO**/ RDKW1003MO**

Spare Parts · Ersatzteile

Type Typ	Screw Schraube	Wrench Schlüssel	
			
FMR03**RD0702	I60M2,0 x 5,0	WT07P	
FMR03**RD1003	I60M3,5 x 7,4	WT15P	

● Ex Stock / ab Lager ○ On demand / auf Anfrage

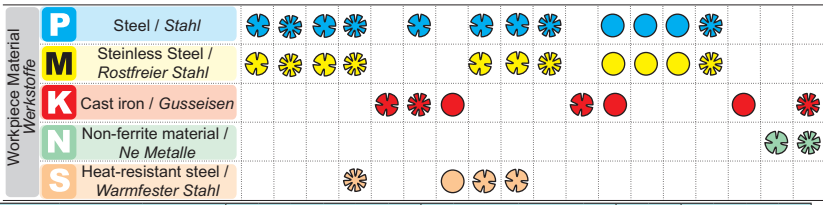
Applicable inserts · Wendeschneidplatten



Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen



Insert shape Plattenform	Type · Typ	Dimension (mm) Abmessung				CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		R	I.C	S	d	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**RDKW0702MO**	3.5	7.0	2.38	2.7				●			●	●										
	RDKW0803MO	4	8.0	3.18	3.4				●				●										
	RDKW1003MO	5	10.0	3.18	3.9			●	●			●	●										
	RDKW10T3MO	5	10.0	3.97	4.4	○			●			●	●										
	RDKW1204MO	6	12.0	4.76	4.4			○	●			●	●										
	RDKW12T3MO	6	12.0	3.97	3.9		○	●	●			●	●									○	
	RDKW1604MO	8	16.0	4.76	5.2				●			●	●										
	RDKW1605MO	8	16.0	5.56	5.5				●			●	●	○									
	RDKW2006MO	10	20.0	6.35	6.5				●		○												

Recommended cutting data · Empfohlene Schnittdaten

Workpiece material Werkstückstoff		Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten	
				V (m/min)	f (mm/z)
P	Low-carbon steel Soft steel Niedrig legierter Kohlenstoffstahl Baustahl	≤180	YBM251 YBC301	270 (220-350)	0.2 (0.08-0.45)
			YBM351 YBG302	220 (180-300)	0.25 (0.15-0.45)
			YBG202	270 (200-360)	0.2 (0.1-0.45)
	High-carbon steel Alloy steel Hoch Leg. Kohlenstoffstahl	180-280	YBM251 YBC301	240 (200-320)	0.2 (0.08-0.45)
			YBM351 YBG302	200 (160-280)	0.25 (0.15-0.45)
			YBG202	240 (180-350)	0.2 (0.1-0.45)
	Alloy tool steel Leg. Werkzeugstahl	280-350	YBM251 YBC301	220 (180-300)	0.2 (0.08-0.45)
			YBM351 YBG302	180 (150-250)	0.25 (0.15-0.45)
			YBG202	220 (170-340)	0.2 (0.1-0.45)
M	Stainless steel Rostfreier Stahl	≤270	YBM251	150 (120-240)	0.2 (0.08-0.45)
			YBM351	150 (100-220)	0.25 (0.1-0.45)
			YBG202	160 (110-270)	0.2 (0.1-0.45)
K	Cast iron Gusseisen	180-250	YBG302	210 (120-300)	0.2 (0.1-0.45)

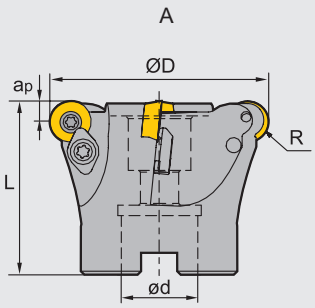
Applicable tool D14-D18
Tools code key B20-B21
Grade selection guide B15-B19
Technical data B164-B170

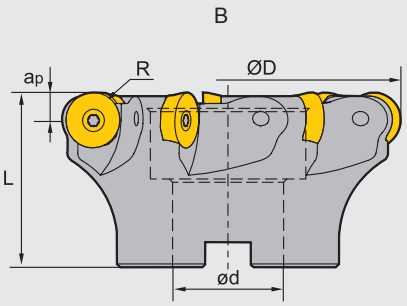
Face Milling Tools · Planfräser



FMR04 P M K





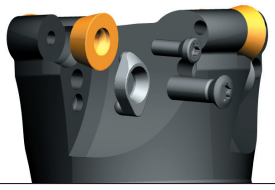


Specification of tools · Werkzeug Beschreibung

Type · Typ		Stock Lager	Dimension (mm) Abmessung					No. of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)
			Ø D	Ø D	L	R	a_{pmax}			
FMR04	**050-A22-RD12-03**	●	50	22	40	6	6	3	A	0.3
	063-A22-RD12-04	●	63	22	50	6	6	4	A	0.5
	080-B27-RD16-05	●	80	27	50	8	8	5	B	1.2
	100-B32-RD16-06	●	100	32	50	8	8	6	B	1.0
	125-B40-RD20-06	○	125	40	63	10	10	6	B	1.9
	160-B40-RD20-07	○	160	40	63	10	10	7	B	3.7

Inserts · WSP: RDKW1204MO**/ RDKW1605MO**/ RDKW2006MO

Spare Parts · Ersatzteile

Diameter Durchmesser Ø D	Screw Schraube	Clamp Pratze	Clamp Screw Schraube (Pratze)	Wrench Schlüssel		
						
Ø50-Ø63	I60M3.5×10	WD-204	I60M4×10	WT15IP	--	
Ø80 -Ø100	I60M5×13	--	--	--	WT20IT	
Ø125 -Ø160	I43M6×16			--	WT25IT	

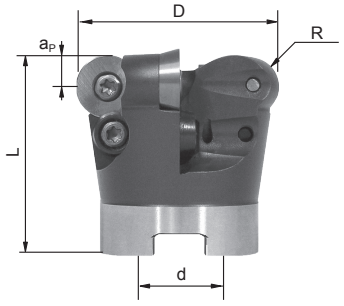
● Ex Stock / ab Lager ○ On demand / auf Anfrage

Face Milling Tools · Planfräser



FMR04 P M K





Type · Typ		Stock Lager	Dimension (mm) Abmessung					No. of teeth Zähne
			Ø D	Ø d	L	R	$a_p$max	
FMR04	**042-A16-RD1003-06**	●	42	16	44	5	5	6
	052-A22-RD1003-07	●	52	22	50	5	5	7

Inserts · WSP: RDKW1003MO**

Type · Typ		Stock Lager	Dimension (mm) Abmessung					No. of teeth Zähne
			Ø D	Ø d	L	R	$a_p$max	
FMR04	**042-A16-RD12T3-05**	●	42	16	42	6	6	5
	052-A22-RD12T3-05	●	52	22	50	6	6	5
	066-A27-RD12T3-06	●	66	27	50	6	6	6
	080-A27-RD12T3-07	●	80	27	50	6	6	7

Inserts · WSP: RDKW12T3MO**

Type · Typ		Stock Lager	Dimension (mm) Abmessung					No. of teeth Zähne
			Ø D	Ø d	L	R	$a_p$max	
FMR04	***052-A22-RD1604-04**	●	52	22	50	8	8	4
	***052-A22-RD1604-05**	●	52	22	50	8	8	5
	066-A27-RD1604-05	●	66	27	50	8	8	5
	080-A27-RD1604-06	●	80	27	52	8	8	6
	100-B32-RD1604-07	○	100	32	52	8	8	7
	125-B40-RD1604-08	○	125	40	52	8	8	8
	160-B40-RD1604-09	○	160	40	52	8	8	9

Inserts · WSP: RDKW1604MO**

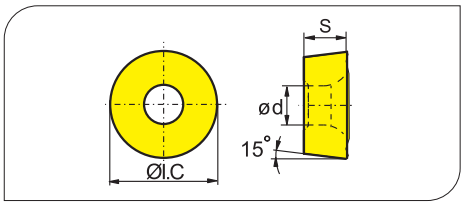
*= WX16N (außer für FMP04-052) (expect for FMP04-052)
**= nur ab (Ø 052) from (Ø 052)

Spare Parts · Ersatzteile

Type Typ	Screw Schraube	Clamp Klemmscheibe	Clamp Screw Klemmschraube	Wrench Schlüssel
				
FMR04**RD1003	I60M3,5 x 7,4	-	-	WT15P
FMR04**RD12T3	I60M3,5 x 7,4	-	**LOM 3,5 x 7,1	WT15P
FMR04**RD1604	I60M4,5 x 9,8	*WX16N	-	WT20P

Applicable tool B9-B15 Werkzeug
Tools code key B24-B25 Werkzeug ISO
Grade selection guide B17-23 Sortenauswahl
Technical data B182-B188 Technische Daten

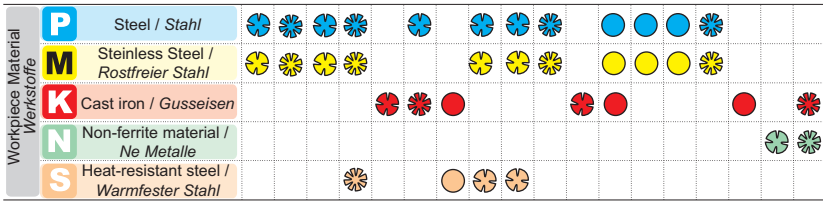
Applicable inserts · Wendeschneidplatten



Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen



Insert shape Plattenform	Type · Typ	Dimension (mm) Abmessung				CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		R	I.C	S	d	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**RDKW0702MO**	3.5	7.0	2.38	2.7				●			●	●										
	RDKW0803MO	4	8.0	3.18	3.4				●				●										
	RDKW1003MO	5	10.0	3.18	3.9			●	●			●	●										
	RDKW10T3MO	5	10.0	3.97	4.4	○			●			●	●										
	RDKW1204MO	6	12.0	4.76	4.4			○	●			●	●										
	RDKW12T3MO	6	12.0	3.97	3.9		○	●	●			●	●									○	
	RDKW1604MO	8	16.0	4.76	5.2				●			●	●										
	RDKW1605MO	8	16.0	5.56	5.5				●			●	●	○									
	RDKW2006MO	10	20.0	6.35	6.5				●		○												

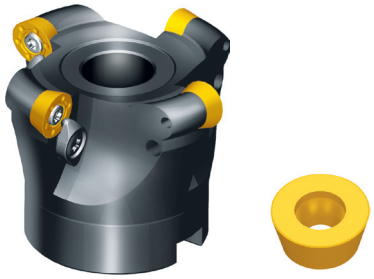
● Ex Stock / ab Lager ○ On demand / auf Anfrage

Recommended cutting data · Empfohlene Schnittdaten

Workpiece material Werkstückstoff		Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten	
				V (m/min)	f (mm/z)
P	Low-carbon steel Soft steel Niedrig legierter Kohlenstoffstahl Baustahl	≤180	YBM251 YBC301	270 (220-350)	0.2 (0.08-0.45)
			YBM351 YBG302	220 (180-300)	0.25 (0.15-0.45)
			YBG202	270 (200-360)	0.2 (0.1-0.45)
	High-carbon steel Alloy steel Hoch Leg. Kohlenstoffstahl	180-280	YBM251 YBC301	240 (200-320)	0.2 (0.08-0.45)
			YBM351 YBG302	200 (160-280)	0.25 (0.15-0.45)
			YBG202	240 (180-350)	0.2 (0.1-0.45)
	Alloy tool steel Leg. Werkzeugstahl	280-350	YBM251 YBC301	220 (180-300)	0.2 (0.08-0.45)
			YBM351 YBG302	180 (150-250)	0.25 (0.15-0.45)
			YBG202	220 (170-340)	0.2 (0.1-0.45)
M	Stainless steel Rostfreier Stahl	≤270	YBM251	150 (120-240)	0.2 (0.08-0.45)
			YBM351 YBG302	150 (100-220)	0.25 (0.1-0.45)
			YBG202	160 (110-270)	0.2 (0.1-0.45)
K	Cast iron Gusseisen	180-250	YBG302	210 (120-300)	0.2 (0.1-0.45)

Applicable tool Werkzeug B9-B15
Tools code key Werkzeug ISO B24-B25
Grade selection guide Sortenauswahl B17-23
Technical data Technische Daten B182-B188

Case study for FMR04
Bearbeitungsbeispiel für FMA04



Workpiece material
Werkstückstoff: 42CrMo (HRC35)
Cooling system
Kühlsystem: dry cutting, trocken

Machine
Maschine: vertical machining center

Cutting data
Schnittdaten:
Vc=200m/min
ap=3mm
fz=0.3mm/z

- Tool · Werkzeug: FMR04-063-A22-RD12-04
- Inserts · WSP: RDKW1204MO/YBG202



- **Wear comparison after 90 min.**
- **Verschleißvergleich nach 90 min.**

ZCC·CT

A company





Square shoulder milling tools · Eckfräser

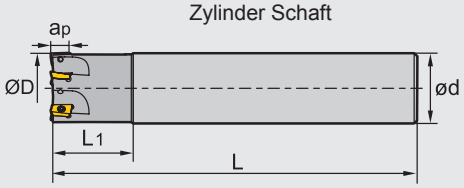
Kr:90°



EMP01 P M K N



Straight shank
Zylinder Schaft

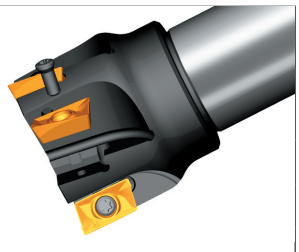


Specification of tools · Werkzeug Beschreibung

Type · Typ		Stock Lager	Dimensions (mm) · Abmessungen					No. of teeth Zähne	Weight Gewicht (kg)
			Ø D	Ø d	L	L_1	a_{pmax}		
EMP01 Straight shank Zylinder Schaft	**012-G16-AP11-01**	●	12	16	85	25	10.5	1	0.1
	016-G16-AP11-02	●	16	16	90	25	10.5	2	0.1
	020-G20-AP11-02	●	20	20	100	30	10.5	2	0.2
	020-G20-AP11-03-M	●	20	20	100	30	10.5	3	0.2
	025-G25-AP11-03	●	25	25	115	35	10.5	3	0.4
	025-G25-AP11-03C	●	25	25	115	35	10.5	3	0.4
	025-G25-AP11-04	●	25	25	115	35	10.5	4	0.4
	032-G32-AP11-04	●	32	32	125	40	10.5	4	0.7
	032-G32-AP11-04C	●	32	32	125	40	10.5	4	0.7
	025-G25-AP16-02	●	25	25	115	35	15.5	2	0.4
	025-G25-AP16-02C	●	25	25	115	35	15.5	2	0.4
	032-G32-AP16-03	●	32	32	125	40	15.5	3	0.7
	032-G32-AP16-03C	●	32	32	125	40	15.5	3	0.7
	040-G32-AP16-03	●	40	32	130	42	15.5	3	0.7
	040-G32-AP16-04	●	40	32	130	42	15.5	4	0.8
	040-G32-AP16-04C	○	40	32	130	42	15.5	4	0.8
	050-G32-AP16-05	●	50	32	135	45	15.5	5	1.0
	050-G32-AP16-05C	○	50	32	135	45	15.5	5	1.0
	063-G32-AP16-06	●	63	32	135	45	15.5	6	1.4
	063-G32-AP16-06C	○	63	32	135	45	15.5	6	1.4

Spare Parts · Ersatzteile

Diameter Durchmesser Ø D	Insert WSP	Screw Schraube	Wrench Schlüssel	
				
Ø12-Ø32	AP11	I60M2.5×6.5T	WT08IP	--
Ø25-Ø63	AP16	I60M4×8.4	--	WT15IS

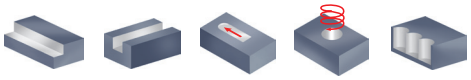


● Ex Stock / ab Lager ○ On demand / auf Anfrage

Applicable tool B9-B15 Werkzeug
Tools code key B24-B25 Werkzeug ISO
Grade selection guide B15-B19 Sortenauswahl
Technical data B293-B374 Technische Daten

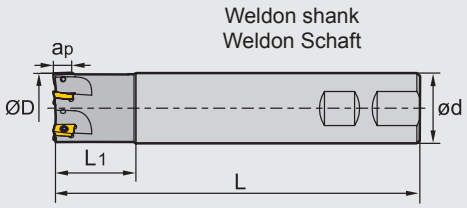
Square shoulder milling tools · Eckfräser

Kr:90°



EMP01 P M K N



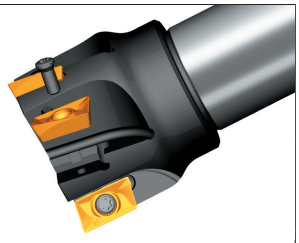


Specification of tools · Werkzeug Beschreibung

Type · Typ		Stock Lager	Dimensions (mm) · Abmessungen					No. of teeth Zähne	Weight Gewicht (kg)
			Ø D	Ø D	L	L_1	a_{pmax}		
EMP01	**012-XP16-AP11-01**	●	12	16	85	25	10.5	1	0.1
Weldon shank	**016-XP16-AP11-02**	●	16	16	90	25	10.5	2	0.1
	020-XP20-AP11-02	●	20	20	100	30	10.5	2	0.2
Weldon Schaft	**020-XP20-AP11-03**	●	20	20	100	30	10.5	3	0.2
	025-XP25-AP11-03	●	25	25	115	35	10.5	3	0.4
	025-XP25-AP11-04	●	25	25	115	35	10.5	4	0.4
	032-XP32-AP11-04	●	32	32	125	40	10.5	4	0.7
	025-XP25-AP16-02	●	25	25	115	35	15.5	2	0.4
	032-XP32-AP16-03	●	32	32	125	40	15.5	3	0.7
	040-XP32-AP16-04	●	40	32	130	42	15.5	4	0.8
	050-XP32-AP16-05	●	50	32	135	45	15.5	5	1.0
	063-XP32-AP16-06	○	63	32	135	45	15.5	6	1.4

Spare Parts · Ersatzteile

Diameter Durchmesser Ø D	Insert WSP	Screw Schraube	Wrench Schlüssel	
				
Ø12-Ø32	AP11	I60M2.5×6.5T	WT08IP	--
Ø25-Ø63	AP16	I60M4×8.4	--	WT15IS



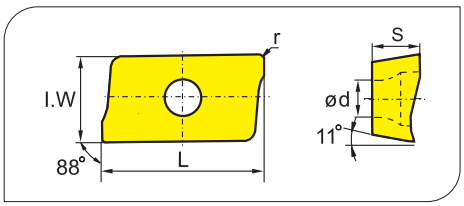
● Ex Stock / ab Lager ○ On demand / auf Anfrage

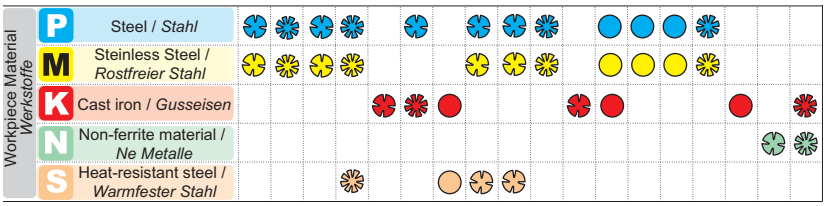
Applicable inserts · Wendeschneidplatten

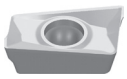
Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen





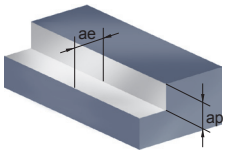
Insert shape Plattenform	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	I.W	S	d	r	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**APKT11T304-PF**	12.24	6.5	3.6	2.8	0.4	○		●	●				●		●								
	APKT11T308-PF	12.24	6.5	3.6	2.8	0.8			●					●										
	APKT11T312-PF	12.24	6.5	3.6	2.8	1.2								○										
	APKT11T316-PF	12.24	6.5	3.6	2.8	1.6								●										
	APKT160408-PF	17.877	9.33	5.76	4.4	0.8	●		●	●				●		●								
	**APKT11T304-PM**	12.24	6.5	3.6	2.8	0.4	●	●	●	●			●	●		●								
	APKT11T308-PM	12.24	6.5	3.6	2.8	0.8	●		●	●	●		●	●		●								
	APKT11T312-PM	12.24	6.5	3.6	2.8	1.2			●					●										
	APKT11T316-PM	12.24	6.5	3.6	2.8	1.6			●					●										
	APKT160408-PM	17.877	9.33	5.76	4.4	0.8	●	●	●	●	●	●	●	●	●	●								
	**APKT11T304-PR**	12.24	6.5	3.6	2.8	0.4		●		●						●								
	**APKT11T304-LH**	12.24	6.5	3.6	2.8	0.4																	●	●
	APKT11T308-LH	12.24	6.5	3.6	2.8	0.8																	●	●
	APKT160408-LH	17.877	9.33	5.76	4.4	0.8																	●	●

Applicable tool B9-B15
Werkzeug
Tools code key B24-B25
Werkzeug ISO
Grade selection guide B17-B23
Sortenauswahl
Technical data B182-B188
Technische Daten

Chipbreaker Selektion EMP01 · Spanbrecher Auswahl EMP01

Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	Roughing Schruppen
P	-PF	-PM	-PR
M	-PF	-PM	-PR
K	-PF	-PM	
AL	-LH		

1 Square shoulder milling
1 Eckfräsen

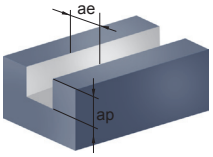


Recommended cutting data · Empfohlene Schnittdaten

Workpiece material Werkstück Material		Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten				
				V(m/min)	f(mm/z)			a_e(mm)
					-PF	-PM	-PR	
P	Low-carbon steel Soft steel Niedrig legierter Kohlenstoffstahl Baustahl	≤180	YBM251 YBC301	320 (240-400)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D
			YBM351	260 (180-380)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D
			YBG202 YBG205	320 (200-400)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D
			YBG302	280 (180-400)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D
	High-carbon steel Alloy steel Hoch Leg. Kohlenstoffstahl Leg. Stahl	180-280	YBM251 YBC301	280 (210-380)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D
			YBM351	240 (160-320)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D
			YBG202 YBG205	280 (180-350)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D
			YBG302	260 (150-380)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D
	Alloy tool steel Leg. Werkzeugstahl	280-350	YBM251 YBC301	260 (180-350)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D
			YBM351	220 (150-280)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D
			YBG202 YBG205	260 (160-330)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D
			YBG302	240 (120-350)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D
M	Stainless steel Rostfreier Stahl	≤270	YBM251	200 (120-270)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D
			YBM351	180 (150-300)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D
			YBG202 YBG205	200 (110-300)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D
			YBG302	170 (100-280)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D
K	Cast iron Gusseisen	180-250	YBG102	220 (120-250)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	-	≤0.5D
			YBD252	200 (120-320)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	-	≤0.5D
N					-LH			
	Al alloy Al Leg.	----	YD101	300-	0.2 (0.08-0.4)			≤0.5D
			YD201	300-	0.2 (0.08-0.4)			≤0.5D

● Ex Stock / ab Lager ○ On demand / auf Anfrage

2 Slot milling
2 Nutenfräsen

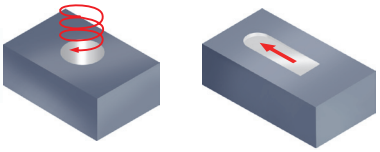


Recommended cutting data · Empfohlene Schnittdaten

Workpiece material Werkstück Material		Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten				
				V(m/min)	f(mm/z)			a_e(mm)
					-PF	-PM	-PR	
P	Low-carbon steel Soft steel Niedrig legierter Kohlenstoffstahl Baustahl	≤180	YBM251 YBC301	190 (170-250)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)	D
			YBM351	150 (130-210)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)	D
			YBG202 YBG205	190 (140-250)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)	D
			YBG302	170 (130-250)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)	D
	High-carbon steel Alloy steel Hoch Leg. Kohlenstoffstahl Leg. Stahl	180-280	YBM251 YBC301	170 (150-220)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)	D
			YBM351	140 (110-200)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)	D
			YBG202 YBG205	170 (130-250)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)	D
			YBG302	150 (110-230)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)	D
	Alloy tool steel Leg. Werkzeugstahl	280-350	YBM251 YBC301	150 (130-210)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)	D
			YBM351	130 (100-180)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)	D
			YBG202 YBG205	150 (110-240)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)	D
			YBG302	140 (80-210)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)	D
M	Stainless steel Rostfreier Stahl	≤270	YBM251	110 (80-190)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)	D
			YBM351	100 (80-170)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)	D
			YBG202 YBG205	120 (80-190)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)	D
			YBG302	100 (70-180)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)	D
K	Cast iron Gusseisen	180-250	YBG102	130 (80-180)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	-	D
			YBD252	120 (80-210)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	-	D
N					-LH			
	Al alloy Al Leg.	----	YD101	300-	0.2 (0.08-0.3)			D
			YD201	300-	0.2 (0.08-0.3)			D

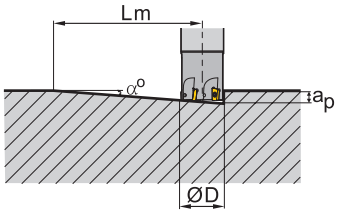
Applicable tool B9-B15 Werkzeug
Tools code key B24-B25 Werkzeug ISO
Grade selection guide B15-B19 Sortenauswahl
Technical data B293-B374 Technische Daten

3 Ramp milling, helical interpolation milling
3 Tauchfräsen, Spiral Interpolationsfräsen



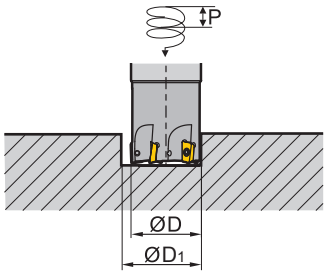
Recommended cutting data · Empfohlene Schnittdaten

- Ramp milling
  Tauchfräsen



$$Lm = \frac{ap}{tg\alpha}$$ (α:Maximum ramp angle)

- Helical interpolation milling
  Spiral Interpolationsfräsen



$$tg\alpha = \frac{P}{\pi D_1}$$ (α:helical angle)

Diameter Durchmesser Ø D (mm)	APKT Ramp milling, helical interpolation milling (Inserts—11) APKT Tauchfräsen, Spiral Interpolationsfräsen				
	Ramp milling Tauchfräsen			Helical interpolation milling Spiral Interpolationsfräsen	
	Max. cutting depth Schnitttiefe a_p(mm)	Max. ramp angle α°	Min. length Länge L_m(mm)	Min. diameter Durchmesser Ø D_1(mm)	Max. pitch Steigung (mm)
16	10.0	10.0	56.7	20.0	2.0
20	10.0	5.0	114.4	28.0	2.0
25	10.0	4.5	127.0	40.0	2.0
32	10.0	3.0	190.8	56.0	2.0
40	10.0	2.0	286.4	70.0	2.0

● Ex Stock / ab Lager ○ On demand / auf Anfrage

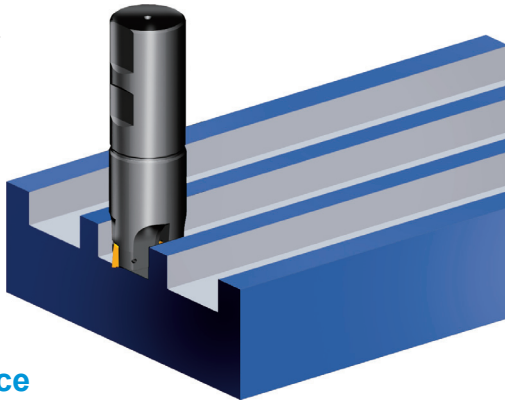
Case study for EMP01
Bearbeitungsbeispiel für EMP01



Workpiece material
Werkstück Material: Cast Stee (HB220)
Cooling system
Kühlsystem: dry cutting, trocken

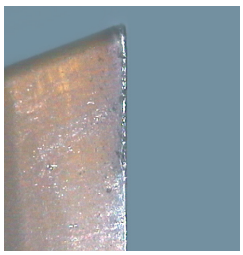
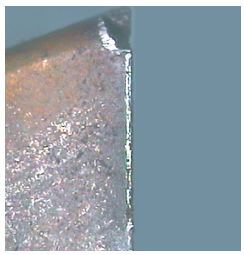
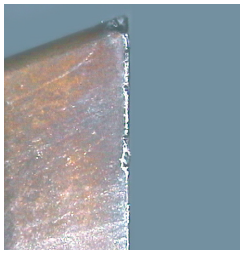
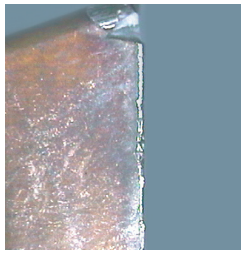
Machine: vertical machining center
Maschine: vertikales Maschinen Center

Cutting data
Schnittdaten:
Vc=180m/min
ap=3mm
fz=0.1mm/z



- Tool · Werkzeug: APKT160408-PM/YBC301
- Inserts · WSP: EMP01-040-XP32-AP16-04

● Wear comparison of insert after milling curved face
● Verschleißvergleich der WSP

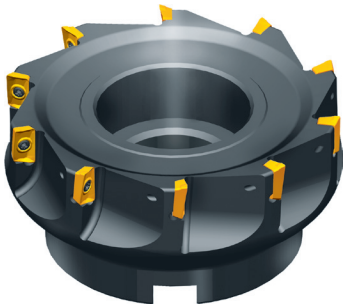
	ZCC-CT	Other company product
15'		
25'		

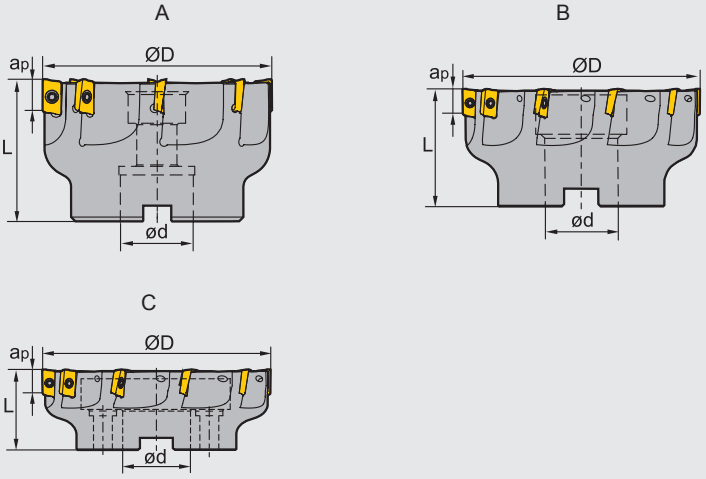
Applicable tool B9-B15
Werkzeug
Tools code key B24-B25
Werkzeug ISO
Grade selection guide B15-B19
Sortenauswahl
Technical data B293-B374
Technische Daten

Square shoulder milling tools · Eckfräser

Kr:90°

EMP02 P M K N



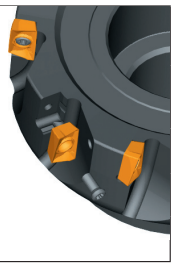


Specification of tools · Werkzeug Beschreibung

Type · Typ		Stock Lager	Dimensions (mm) · Abmessungen				No. of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)
			Ø D	Ø D	L	a_{pmax}			
EMP02	**050-A22-AP11-06**	●	50	22	40	11	6	A	0.3
	050-A22-AP11-06C	○	50	22	40	11	6	A	
	063-A22-AP11-08	●	63	22	40	11	8	A	0.6
	063-A22-AP11-08C	○	63	22	40	11	8	A	
	080-A27-AP11-08	●	80	27	50	11	8	A	1.2
	080-A27-AP11-08C	○	80	27	50	11	8	A	
	100-B32-AP11-10	●	100	32	50	11	10	B	1.7
	050-A22-AP16-05	●	50	22	40	15.5	5	A	0.3
	050-A22-AP16-05C	○	50	22	40	15.5	5	A	
	063-A22-AP16-06	●	63	22	40	15.5	6	A	0.5
	063-A22-AP16-06C	○	63	22	40	15.5	6	A	
	080-A27-AP16-07	●	80	27	50	15.5	7	A	1.1
	080-A27-AP16-07C	○	80	27	50	15.5	7	A	
	100-B32-AP16-08	●	100	32	50	15.5	8	B	1.6
	125-B40-AP16-10	●	125	40	63	15.5	10	B	3.2
	160-B40-AP16-10	○	160	40	63	15.5	10	B	6.3
	200-C60-AP16-12	○	200	60	63	15.5	12	C	8.1
	250-C60-AP16-12	○	250	60	63	15.5	12	C	11.2

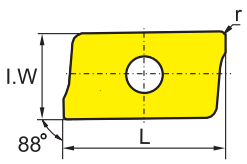
Spare Parts · Ersatzteile

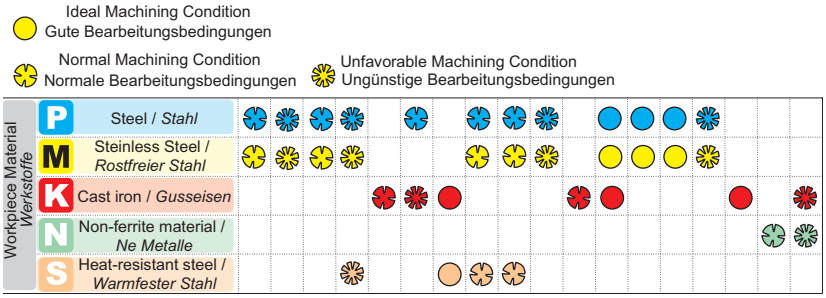
Diameter Durchmesser Ø D	Insert WSP	Screw Schraube	Wrench Schlüssel
			
Ø50-Ø100	AP11	I60M2.5×6.5T	WT08IS
Ø50-Ø100	AP16	I60M4×10	WT15IS

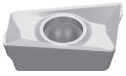


● Ex Stock / ab Lager ○ On demand / auf Anfrage

Applicable inserts · Wendeschneidplatten





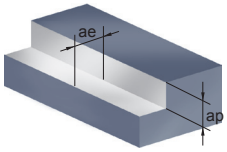
Insert shape Plattenform	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	I.W	S	d	r	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**APKT11T304-PF**	12.24	6.5	3.6	2.8	0.4	○		●	●				●		●								
	APKT11T308-PF	12.24	6.5	3.6	2.8	0.8			●					●										
	APKT11T312-PF	12.24	6.5	3.6	2.8	1.2								○										
	APKT11T316-PF	12.24	6.5	3.6	2.8	1.6								●										
	APKT160408-PF	17.877	9.33	5.76	4.4	0.8	●		●	●				●		●								
	**APKT11T304-PM**	12.24	6.5	3.6	2.8	0.4	●	●	●	●			●	●		●								
	APKT11T308-PM	12.24	6.5	3.6	2.8	0.8	●		●	●	●		●	●		●								
	APKT11T312-PM	12.24	6.5	3.6	2.8	1.2			●					●										
	APKT11T316-PM	12.24	6.5	3.6	2.8	1.6			●					●										
	APKT160408-PM	17.877	9.33	5.76	4.4	0.8	●	●	●	●	●	●	●	●	●	●								
	**APKT11T304-PR**	12.24	6.5	3.6	2.8	0.4		●		●						●								
	**APKT11T304-LH**	12.24	6.5	3.6	2.8	0.4																	●	●
	APKT11T308-LH	12.24	6.5	3.6	2.8	0.8																	●	●
	APKT160408-LH	17.877	9.33	5.76	4.4	0.8																	●	●

Applicable tool B9-B15
Werkzeug
Tools code key B24-B25
Werkzeug ISO
Grade selection guide B17-B23
Sortenauswahl
Technical data B182-B188
Technische Daten

Chipbreaker Selektion · Spanbrecher Auswahl

Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	Roughing Schruppen
P	-PF	-PM	-PR
M	-PF	-PM	-PR
K	-PF	-PM	
AL	-LH		

Square shoulder milling
Eckfräsen



Recommended cutting data · Empfohlene Schnittdaten

Workpiece material Werkstück Material		Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten				
				V(m/min)	f(mm/z)			a_e(mm)
					-PF	-PM	-PR	
P	Low-carbon steel Soft steel Niedrig legierter Kohlenstoffstahl Baustahl	≤180	YBM251 YBC301	320 (240-400)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D
			YBM351	260 (180-380)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D
			YBG202 YBG205	320 (200-400)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D
			YBG302	280 (180-400)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D
	High-carbon steel Alloy steel Hoch Leg. Kohlenstoffstahl Leg. Stahl	180-280	YBM251 YBC301	280 (210-380)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D
			YBM351	240 (160-320)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D
			YBG202 YBG205	280 (180-350)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D
			YBG302	260 (150-380)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D
	Alloy tool steel Leg. Werkzeugstahl	280-350	YBM251 YBC301	260 (180-350)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D
			YBM351	220 (150-280)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D
			YBG202	260 (160-330)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D
			YBG302	240 (120-350)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D
M	Stainless steel Rostfreier Stahl	≤270	YBM251	200 (120-270)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D
			YBM351	180 (150-300)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D
			YBG202	200 (110-300)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D
			YBG302	170 (100-280)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D
K	Cast iron Gusseisen	180-250	YBG102	220 (120-250)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	-	≤0.5D
			YBD252	200 (120-320)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	-	≤0.5D
N					-LH			
	Al alloy Al Leg.	----	YD101	300-	0.2 (0.08-0.4)			≤0.5D
			YD201	300-	0.2 (0.08-0.4)			≤0.5D

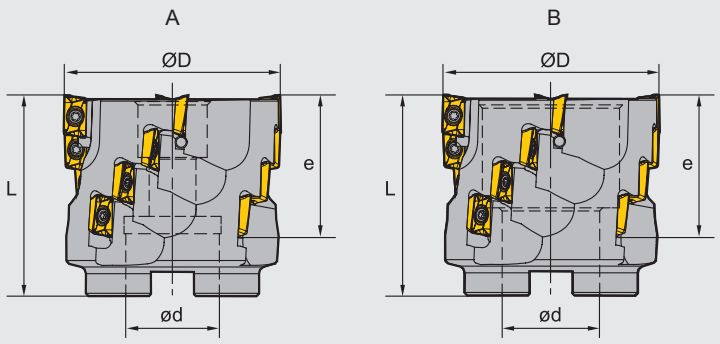
● Ex Stock / ab Lager ○ On demand / auf Anfrage

Square shoulder milling tools · Eckfräser

Kr:90°

EMP03 P M K N





Specification of tools · Werkzeug Beschreibung

Type · Typ		Stock Lager	Dimensions (mm) · Abmessungen				Flute number z	No. of inserts WSP Anzahl	Coupling Aufnahme	Weight Gewicht (kg)
			Ø D	Ø D	L	e				
EMP03	**-050-A22-AP11-04**	●	50	22	58	39	4	16	A	0.5
	-063-A27-AP11-04	●	63	27	58	39	4	16	A	0.9
	-080-B32-AP11-05	●	80	32	63	39	5	20	B	1.3
	-100-B40-AP11-06	●	100	40	63	39	6	24	B	2.0

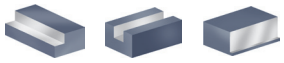
Spare Parts · Ersatzteile

Diameter Durchmesser Ø D	Screw Schraube	Wrench Schlüssel	
			
Ø50-Ø100	I60M2.5×6.5T	WT08IS	

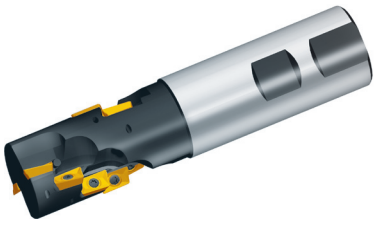


Square shoulder milling tools · Eckfräser

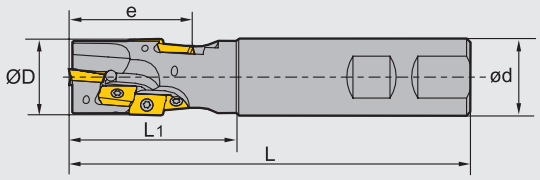
Kr:90°



EMP04 P M K N



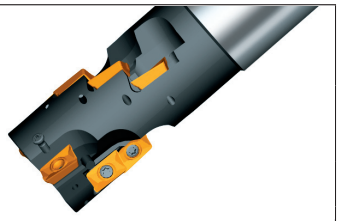
Weldon shank
Weldon Schaft



Specification of tools · Werkzeug Beschreibung

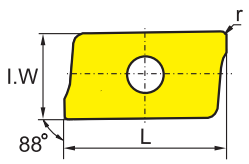
Type · Typ		Stock Lager	Dimensions (mm) · Abmessungen					Flute number	No. of inserts WSP Anzahl	Weight Gewicht (kg)
			Ø D	Ø D	L	L_1	e			
EMP04	**-020-XP20-AP11-01**	●	20	20	120	45	29.4	1	3	0.3
	-025-XP25-AP11-02	●	25	25	130	55	38.9	2	8	0.4
	-032-XP32-AP11-02	●	32	32	140	65	48.5	2	10	0.7
	-040-XP40-AP11-02	●	40	40	150	75	58.0	2	14	1.3

Spare Parts · Ersatzteile

Diameter Durchmesser Ø D	Screw Schraube	Wrench Schlüssel	
			
Ø20-Ø40	I60M2.5×6.5T	WT08IS	

● Ex Stock / ab Lager ○ On demand / auf Anfrage

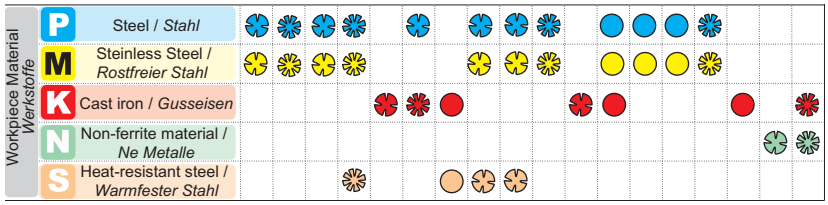
Applicable inserts · Wendeschneidplatten

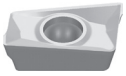


Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen



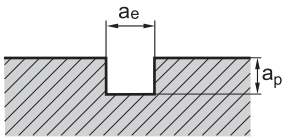
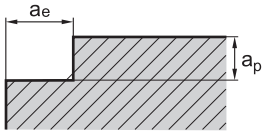
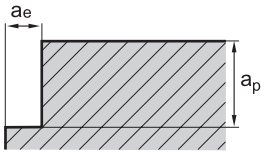
Insert shape Plattenform	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	I.W	S	d	r	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**APKT11T304-PF**	12.24	6.5	3.6	2.8	0.4	○		●	●				●		●								
	APKT11T308-PF	12.24	6.5	3.6	2.8	0.8			●					●										
	APKT11T312-PF	12.24	6.5	3.6	2.8	1.2								○										
	APKT11T316-PF	12.24	6.5	3.6	2.8	1.6								●										
	APKT160408-PF	17.877	9.33	5.76	4.4	0.8	●		●	●				●		●								
	**APKT11T304-PM**	12.24	6.5	3.6	2.8	0.4	●	●	●	●			●	●		●								
	APKT11T308-PM	12.24	6.5	3.6	2.8	0.8	●		●	●	●		●	●		●								
	APKT11T312-PM	12.24	6.5	3.6	2.8	1.2			●					●										
	APKT11T316-PM	12.24	6.5	3.6	2.8	1.6			●					●										
	APKT160408-PM	17.877	9.33	5.76	4.4	0.8	●	●	●	●	●	●	●	●	●	●								
	**APKT11T304-PR**	12.24	6.5	3.6	2.8	0.4		●		●						●								
	**APKT11T304-LH**	12.24	6.5	3.6	2.8	0.4																	●	●
	APKT11T308-LH	12.24	6.5	3.6	2.8	0.8																	●	●
	APKT160408-LH	17.877	9.33	5.76	4.4	0.8																	●	●

Chipbreaker Selektion · Spanbrecher Auswahl

Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	Roughing Schruppen
P	-PF	-PM	-PR
M	-PF	-PM	-PR
K	-PF	-PM	
AL	-LH		

Applicable tool Werkzeug B9-B15
Tools code key Werkzeug ISO B24-B25
Grade selection guide Sortenauswahl B17-B23
Technical data Technische Daten B182-B188

Recommended cutting data · Empfohlene Schnittdaten

Slot milling · Nutenfräsen	Square shoulder milling Eckfräsen	Deep square shoulder milling Tiefes Eckfräsen
		
ae=D ap:≤0.5D	ae:≤0.5D ap:≤1.2D	ae:≤0.2D ap<Cutting length of insert Schneidkantenlänge

Workpiece material Werkstück Material		Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten			
				Square shoulder milling · Eckfräsen			
				V(m/min)	f(mm/z)		
					-PF	-PM	-PR
P	Low-carbon steel Soft steel Niedrig legierter Kohlenstoffstahl Baustahl	≤180	YBM251 YBC301	270 (240-350)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)
			YBM351	220 (180-300)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)
			YBG202 YBG205	270 (200-360)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)
			YBG302	240 (180-350)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)
	High-carbon steel Alloy steel Hoch Leg. Kohlenstoffstahl Leg. Stahl	180-280	YBM251 YBC301	240 (210-320)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)
			YBM351	200 (160-280)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)
			YBG202 YBG205	240 (180-360)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)
			YBG302	220 (150-330)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)
	Alloy tool steel Leg. Werkzeugstahl	280-350	YBM251 YBC301	220 (180-300)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)
			YBM351	180 (150-250)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)
			YBG202 YBG205	220 (160-340)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)
			YBG302	200 (120-300)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)
M	Stainless steel Rostfreier Stahl	≤270	YBM251	170 (120-240)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)
			YBM351	160 (150-270)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)
			YBG202 YBG205	150 (110-270)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)
			YBG302	140 (100-250)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)
K	Cast iron Gusseisen	180-250	YBG102	200 (120-240)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	
			YBD252	180 (120-300)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	
N					-LH		
	Al alloy Al Leg.	----	YD101	300-	0.2 (0.08-0.4)		
			YD201	300-	0.2 (0.08-0.4)		

● Ex Stock / ab Lager ○ On demand / auf Anfrage

Recommended cutting data · Empfohlene Schnittdaten

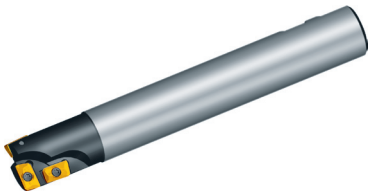
Workpiece material Werkstück Material		Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten			
				Slot milling, deep square shoulder milling Nutenfräsen, Eckfräsen			
				V(m/min)	f(mm/z)		
					-PF	-PM	-PR
P	Low-carbon steel Soft steel Niedrig legierter Kohlenstoffstahl Baustahl	≤180	YBM251 YBC301	270 (240-350)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)
			YBM351	220 (180-300)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)
			YBG202 YBG205	270 (200-360)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)
			YBG302	240 (180-350)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)
	High-carbon steel Alloy steel Hoch Leg. Kohlenstoffstahl Leg. Stahl	180-280	YBM251 YBC301	240 (210-320)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)
			YBM351	200 (160-280)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)
			YBG202 YBG205	240 (180-360)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)
			YBG302	220 (150-330)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)
	Alloy tool steel Leg. Werkzeugstahl	280-350	YBM251 YBC301	220 (180-300)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)
			YBM351	180 (150-250)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)
			YBG202 YBG205	220 (160-340)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)
			YBG302	200 (120-300)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)
M	Stainless steel Rostfreier Stahl	≤270	YBM251	170 (120-240)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)
			YBM351	160 (150-270)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)
			YBG202 YBG205	150 (110-270)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)
			YBG302	140 (100-250)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)
K	Cast iron Gusseisen	180-250	YBG102	200 (120-240)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	
			YBD252	180 (120-300)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	
N					-LH		
	Al alloy Al Leg.	----	YD101	300-	0.2 (0.08-0.3)		
			YD201	300-	0.2 (0.08-0.3)		

Applicable tool Werkzeug B9-B15
Tools code key Werkzeug ISO B24-B25
Grade selection guide Sortenauswahl B15-B19
Technical data Technische Daten B293-B374

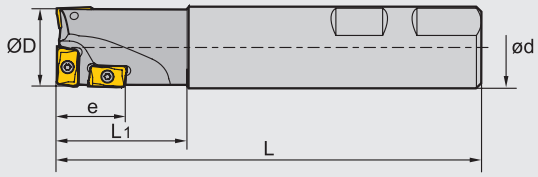
Square shoulder milling tools · Eckfräser

Kr:90°

EMP05 P M K



Weldon shank
Weldon Schaft

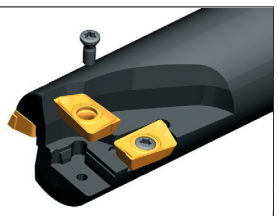


Specification of tools · Werkzeug Beschreibung

Type · Typ		Stock Lager	Dimensions (mm) · Abmessungen					No. of inserts WSP Anzahl		Weight Gewicht (kg)
		R	Ø D	Ø D	L	L_1	e	APMT11	APMT16	
EMP05	**-025-XP25**	●	25	25	130	40	20	3	--	0.5
	-032-XP32	●	32	32	140	50	30	1	2	0.8
	-040-XP32	●	40	32	150	60	40	--	4	1.0

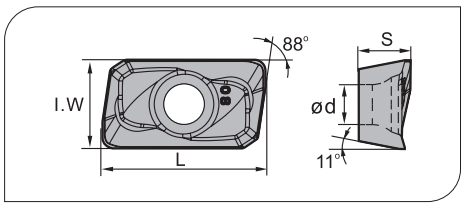
Spare Parts · Ersatzteile

Diameter Durchmesser Ø D	Insert WSP	Screw Schraube	Wrench Schlüssel
			
Ø25-Ø40	APMT11	I60M2.5×6.5T	WT08IP
	APMT16	I60M4×10	WT15IP



● Ex Stock / ab Lager ○ On demand / auf Anfrage

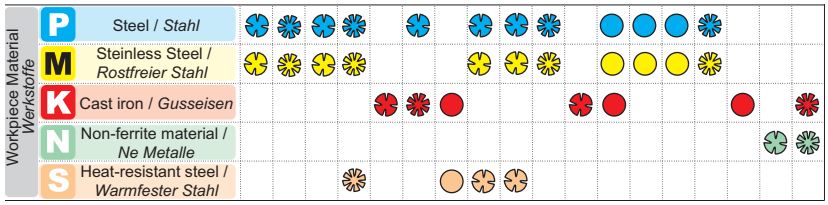
Applicable inserts · Wendeschneidplatten

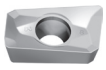


Ideal Machining Condition
Gute Bearbeitungsbedingungen

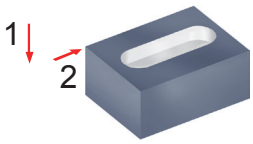
Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen



Insert shape Plattenform	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	I.W	S	d	r	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**APMT1135PDR**	11.25	6.2	3.5	2.8	0.8			●				○	○	●									
	**APMT160408PDER**	17.25	9.25	4.76	4.4	0.8							○		●									

1 Drilling Bohren



Recommended cutting data · Empfohlene Schnittdaten

	Workpiece material Werkstück Material	Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten	
				V(m/min)	f(mm/z)
P	Low-carbon steel Soft steel Niedrig legierter Kohlenstoffstahl Baustahl	≤180	YBG202 YBG205	180 (150-220)	0.2 (0.08-0.25)
P	High-carbon steel Alloy steel Hoch Leg. Kohlenstoffstahl	180-280	YBG202 YBG205	160 (130-200)	0.15 (0.08-0.2)
P	Alloy tool steel Leg. Werkzeugstahl	280-350	YBG202 YBG205	140 (120-180)	0.12 (0.05-0.2)
M	Stainless steel Rostfreier Stahl	≤270	YBG202 YBG205	80 (50-150)	0.08 (0.03-0.15)
K	Cast iron Gusseisen	180-250	YBG202 YBG205	150 (100-220)	0.15 (0.08-0.2)

2 Milling Fräsen

Recommended cutting data · Empfohlene Schnittdaten

	Workpiece material Werkstück Material	Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten	
				V(m/min)	f(mm/z)
P	Low-carbon steel Soft steel Niedrig legierter Kohlenstoffstahl Baustahl	≤180	YBG202 YBG205	190 (140-250)	0.08 (0.04-0.15)
P	High-carbon steel Alloy steel Hoch Leg. Kohlenstoffstahl	180-280	YBG202 YBG205	170 (130-250)	0.08 (0.04-0.15)
P	Alloy tool steel Leg. Werkzeugstahl	280-350	YBG202 YBG205	150 (110-240)	0.08 (0.04-0.15)
M	Stainless steel Rostfreier Stahl	≤270	YBG202 YBG205	120 (80-190)	0.08 (0.04-0.15)
K	Cast iron Gusseisen	180-250	YBG202 YBG205	120 (80-210)	0.08 (0.04-0.15)

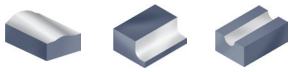
Applicable tool B9-B15
Werkzeug

Tools code key B24-B25
Werkzeug ISO

Grade selection guide B17-B23
Sortenauswahl

Technical data B182-B188
Technische Daten

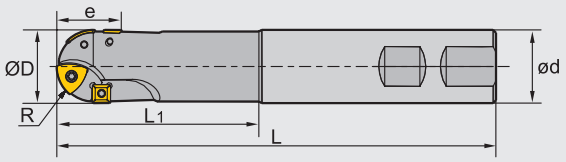
Profil milling tools · Profilfräser



BMR01 P M K



Weldon shank
Weldon Schaft

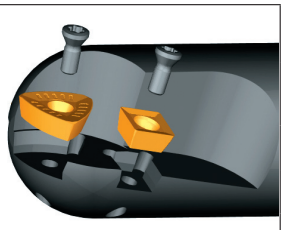


Specification of tools · Werkzeug Beschreibung

Type · Typ		Stock Lager	Dimensions (mm) · Abmessungen						Inserts · WSP				Weight Gewicht (kg)
			R	Ø D	e	ø d	L	L_1	Type · Typ	Quantity Anzahl	Type · Typ	Quantity Anzahl	
BMR01	**-020-XP20-S**	○	10	20	20	20	125	50	ZDET08T2CYR10	2	SPMT060304	2	0.3
	-020-XP20-M	○	10	20	20	20	150	75	ZDET08T2CYR10	2	SPMT060304	2	0.3
	-020-XP20-L	○	10	20	20	20	200	100	ZDET08T2CYR10	2	SPMT060304	2	0.4
	-025-XP25-S	○	12.5	25	23	25	150	70	ZDET1103CYR12.5	2	SPMT060304	2	0.5
	-025-XP25-M	○	12.5	25	23	25	175	95	ZDET1103CYR12.5	2	SPMT060304	2	0.6
	-025-XP25-L	○	12.5	25	23	25	200	100	ZDET1103CYR12.5	2	SPMT060304	2	0.7
	-032-XP32-S	○	16	32	31	32	175	85	ZDET13T3CYR16	2	SDMT090308	2	0.9
	-032-XP32-M	○	16	32	31	32	200	100	ZDET13T3CYR16	2	SDMT090308	2	1.1
	-032-XP32-L	○	16	32	31	32	250	150	ZDET13T3CYR16	2	SDMT090308	2	1.4
	-040-XP40-S	○	20	40	41	40	175	85	ZPNT2204CY(R20)	3	SPMT120408	2	1.4
	-040-XP40-M	○	20	40	41	40	200	100	ZPNT2204CY(R20)	3	SPMT120408	2	1.7
	-040-XP40-L	○	20	40	41	40	250	150	ZPNT2204CY(R20)	3	SPMT120408	2	2.1
	-050-XP40-S	○	25	50	45	40	200	100	ZPNT2204CY(R25)	3	SPMT120408	2	1.8
	-050-XP40-M	○	25	50	45	40	300	100	ZPNT2204CY(R25)	3	SPMT120408	2	2.8
	-063-XP40-S	○	31.5	63	52	40	200	100	ZPNT2204CY(R31)	4	SPMT120408	2	3.0
	-063-XP40-M	○	31.5	63	52	40	300	100	ZPNT2204CY(R31)	4	SPMT120408	2	3.5

Spare parts · Ersatzteile

Diameter Durchmesser Ø D	Screw Schraube	Wrench Schlüssel	
			
Ø20-Ø25	I43M2.5×5.7	WT07IP	--
Ø32	I43M4×8	--	WT15IS
Ø40-Ø63	I43M5×11	--	WT20IS



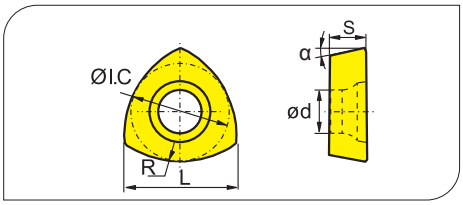
● Ex Stock / ab Lager ○ On demand / auf Anfrage

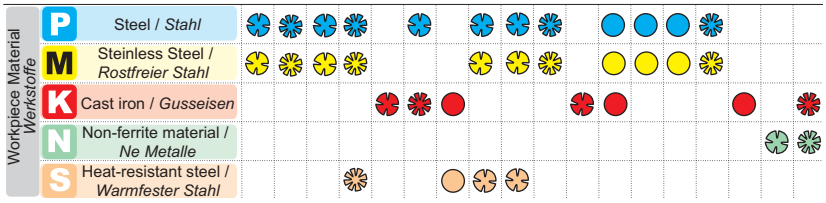
Applicable inserts · Wendeschneidplatten

Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen





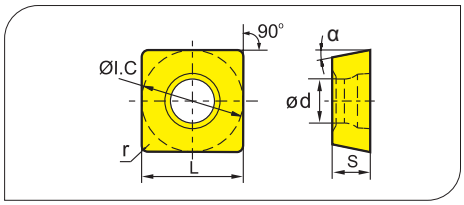
Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen						CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		R	L	I.C	S	d	α	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**ZDET08T2CYR10**	10	8.4	6.75	2.78	2.8	14°			●															
	ZDET1103CYR12.5	12.5	10.6	8.5	3.18	2.8	14°			●															
	ZDET13T3CYR16	16	13.2	10.5	3.97	4.4	14°			○															
	**ZPNT2204CY(R20)**	20	16.1	12.7	4.76	5.56	11°			○															
	ZPNT2204CY(R25)	25	16.9	12.7	4.76	5.56	11°			○															
	ZPNT2204CY(R31)	31.5	17.6	12.7	4.76	5.56	11°			○															

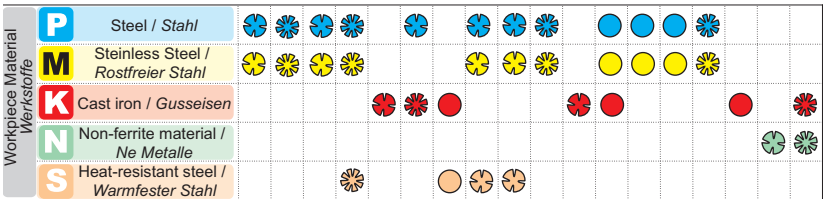
Applicable inserts · Wendeschneidplatten

Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen





Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen						CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		r	L	I.C	S	d	α	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**SPMT060304**	0.4	6.35	6.35	3.18	2.8	11°			●															
	SDMT090308	0.8	9.525	9.525	3.18	4.4	15°			●															
	SPMT120408	0.8	12.7	12.70	4.76	5.5	11°	●	●																

Applicable tool B9-B15
Werkzeug

Tools code key B24-B25
Werkzeug ISO

Grade selection guide B17-23
Sortenauswahl

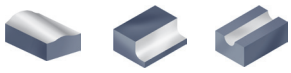
Technical data B182-B188
Technische Daten

Recommended Cutting data · Schnittdaten

Workpiece material Werkstück-stoff		Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten	
				V(m/min)	f(mm/z)
P	Low-carbon steel Soft steel Niedrig legierter Kohlenstoffstahl Baustahl	≤180	YBM251	180(120-220)	0.25(0.1-0.4)
			YBG302	160(120-220)	0.25(0.1-0.4)
	High-carbon steel Alloy steel Hoch Leg. Kohlenstoffstahl Leg. Stahl	180-280	YBM251	150(100-200)	0.2(0.1-0.4)
			YBG302	120(100-200)	0.2(0.1-0.4)
	Alloy tool steel Leg. Werkzeugstahl	280-350	YBM251	100(80-150)	0.2(0.1-0.3)
			YBG302	100(80-150)	0.2(0.1-0.3)
M	Stainless steel Rostfreier Stahl	≤270	YBM251	100(80-150)	0.2(0.1-0.3)
			YBG302	100(80-150)	0.2(0.1-0.3)
K	Cast iron Gusseisen	180-250	YBG302	150(100-180)	0.3(0.2-0.5)

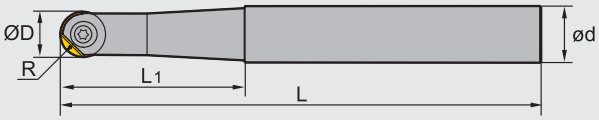
● Ex Stock / ab Lager ○ On demand / auf Anfrage

Profil milling tools · Profilfräser



BMR02 P M K

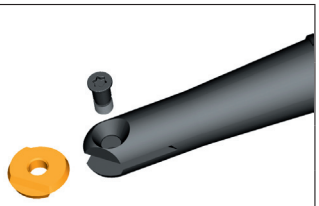




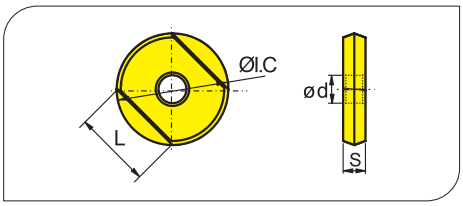
Specification of tools · Werkzeug Beschreibung

Type · Typ		Stock Lager	Dimensions (mm) · Abmessungen					Weight Gewicht (kg)
			R	Ø D	ø d	L	L_1	
BMR02	**-012-G16-S**	●	6	12	16	110	40	0.1
	-012-G16-M	●	6	12	16	130	50	0.2
	-012-G16-L	●	6	12	16	160	50	0.2
	-016-G20-S	●	8	16	20	160	45	0.3
	-016-G20-M	●	8	16	20	170	65	0.3
	-016-G20-L	●	8	16	20	200	65	0.4
	-020-G25-S	●	10	20	25	160	60	0.5
	-020-G25-M	●	10	20	25	200	80	0.6
	-020-G25-L	●	10	20	25	240	80	0.8

Spare parts · Ersatzteile

Diameter Durchmesser Ø D	Screw Schraube	Wrench Schlüssel	
			
Ø12	I90M4×09TT	WT10S	
Ø16	I90M5×11TT	WT15S	
Ø20	I90M5×13.5TT	WT15S	

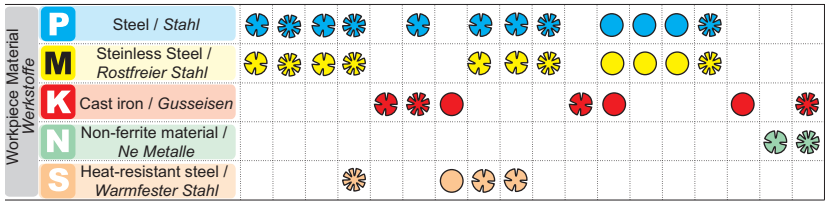
Applicable inserts · Wendeschneidplatten

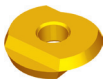


Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen



Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen				CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		I.C	L	S	d	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**ROHX1203**	12	8.5	3	4				●			○	○				○						
	ROHX1604	16	11.3	4	5				●				●				○						
	ROHX2005	20	14.1	5	5				●				●				○						

Recommended Cutting data · Schnittdaten

Workpiece material Werkstück-stoff		Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten	Diameter · Durchmesser Ø D		
					Ø12	Ø16	Ø20
P	carbon steel leg. Kohlenstoff-stahl	HB≤180	YBG202 YBG252 YBM351	V(m/min)	100~200	100~200	100~200
				f_z(mm/z)	0.15~0.25	0.2~0.3	0.2~0.3
				a_{pmax}(mm)	0.8	1	1.25
				a_{emax}(mm)	0.8	1	1.25
	Alloy steel Leg. Stahl	HB180~280		V(m/min)	80~180	80~180	80~180
				f_z(mm/z)	0.15~0.25	0.2~0.3	0.2~0.3
				a_{pmax}(mm)	0.8	1	1.25
				a_{emax}(mm)	0.8	1	1.25
	Hardened steel gehärteter Stahl	HRC55~65		V(m/min)	60~100	60~100	60~100
				f_z(mm/z)	0.15~0.25	0.2~0.3	0.2~0.3
				a_{pmax}(mm)	0.4	0.5	0.6
				a_{emax}(mm)	0.4	0.5	0.6
M	Stainless steel Rostfreier Stahl	HB≤270		V(m/min)	70~150	70~150	70~150
				f_z(mm/z)	0.1~0.2	0.1~0.25	0.1~0.25
				a_{pmax}(mm)	0.6	0.8	1
				a_{emax}(mm)	0.6	0.8	1
K	Cast iron Gusseisen	HB180-250		V(m/min)	160~300	160~300	160~300
				f_z(mm/z)	0.2~0.3	0.25~0.35	0.25~0.35
				a_{pmax}(mm)	1	1.5	1.8
				a_{emax}(mm)	1	1.5	1.8

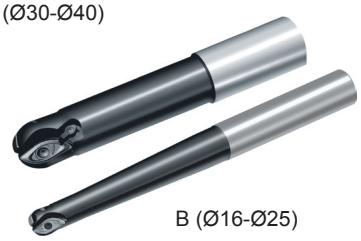
● Ex Stock / ab Lager ○ On demand / auf Anfrage

Profil milling tools · Profilfräser



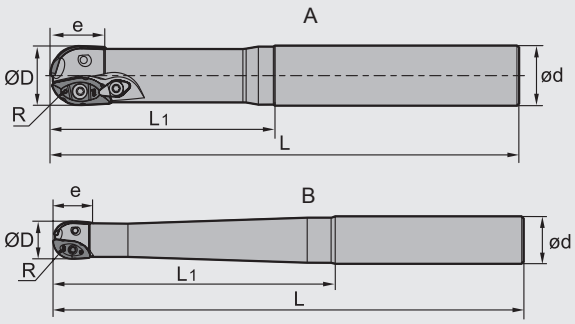
BMR03 P M K

A (Ø30-Ø40)



B (Ø16-Ø25)

Straigth shank
Zylinder Schaft



Specification of tools · Werkzeug Beschreibung

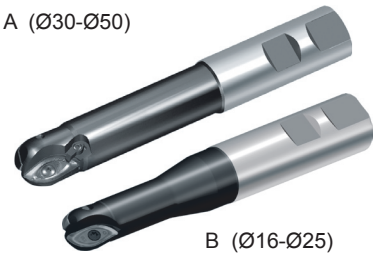
Type · Typ		Stock Lager	Dimensions (mm) · Abmessungen						No. of teeth Zähne	Weight Gewicht (kg)	Type · Typ	Clamp Pratze
			R	Ø D	ø d	L	L_1	e				
BMR03	**-016-G20-S**	●	8	16	20	150	70	16	2	0.3	B	
	-016-G20-M	●	8	16	20	180	80	16	2	0.4	B	
	-020-G25-S	●	10	20	25	180	80	20	2	0.5	B	
	-020-G25-M	●	10	20	25	200	100	20	2	0.6	B	
	-020-G25-L	●	10	20	25	250	150	20	2	0.7	B	
	-020-G25-XL	○	10	20	25	300	110	20	2	1.0	B	
	-025-G25-S	●	12.5	25	25	180	80	25	2	0.6	B	
	-025-G25-M	●	12.5	25	25	200	100	25	2	0.7	B	
	-025-G25-L	○	12.5	25	25	250	110	25	2	0.8	B	
	-025-G25-XL	○	12.5	25	25	300	120	25	2	1.0	B	
	-030-G32-S	●	15	30	32	200	120	30	2	1.0	A	WD-208
	-030-G32-M	●	15	30	32	250	150	30	2	1.3	A	
	-030-G32-L	●	15	30	32	300	200	30	2	1.6	A	
	-030-G32-XL	○	15	30	32	350	200	30	2	1.9	A	
	-032-G32-S	●	16	32	32	200	120	32	2	1.1	A	
	-032-G32-M	●	16	32	32	250	150	32	2	1.4	A	
	-032-G32-L	●	16	32	32	300	200	32	2	1.6	A	
	-032-G32-XL	○	16	32	32	350	200	32	2	2.0	A	
	-040-G40-S	○	20	40	40	200	120	40	2	1.6	A	CBH5R1
	-040-G40-M	○	20	40	40	250	150	40	2	2.0	A	
	-040-G40-L	●	20	40	40	300	200	40	2	2.5	A	
	-040-G40-XL	○	20	40	40	350	200	40	2	3.0	A	

Profil milling tools · Profilfräser



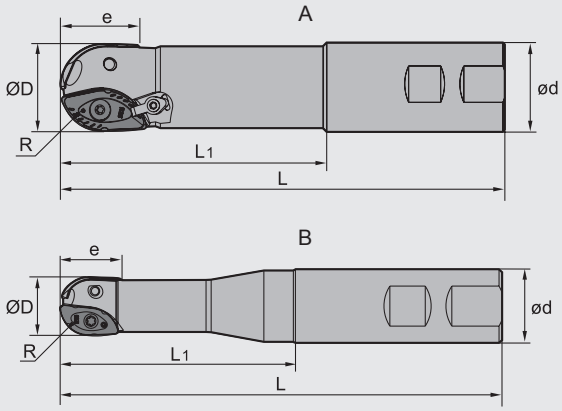
BMR03 P M K

A (Ø30-Ø50)



B (Ø16-Ø25)

Weldon shank
Weldon Schaft



Specification of tools · Werkzeug Beschreibung

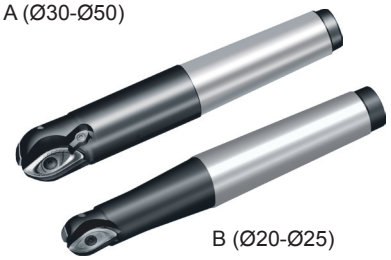
Type · Typ		Stock Lager	Dimensions (mm) · Abmessungen						No. of teeth Zähne	Weight Gewicht (kg)	Type · Typ	Clamp Pratze
			R	Ø D	ø d	L	L1	e				
BMR03	**-016-XP20-M**	●	8	16	20	111	60	16	2	0.2	B	
	-020-XP25-M	●	10	20	25	127	70	20	2	0.3	B	
	-020-XP25-L	●	10	20	25	150	80	20	2	0.4	B	
	-025-XP25-M	●	12.5	25	25	137	80	25	2	0.4	B	
	-025-XP25-L	●	12.5	25	25	200	100	25	2	0.6	B	
	-030-XP32-M	●	15	30	32	161	100	30	2	0.8	A	WD-208
	-030-XP32-L	●	15	30	32	250	150	30	2	1.3	A	
	-032-XP32-M	●	16	32	32	161	100	32	2	0.8	A	
	-032-XP32-L	●	16	32	32	250	120	32	2	1.3	A	
	-040-XP40-M	○	20	40	40	175	100	40	2	1.3	A	CBH5R1
	-040-XP40-L	●	20	40	40	250	120	40	2	2.0	A	
	-050-XP50-M	○	25	50	50	200	100	50	2	2.5	A	
	-050-XP50-L	○	25	50	50	250	150	50	2	3.1	A	

● Ex Stock / ab Lager ○ On demand / auf Anfrage

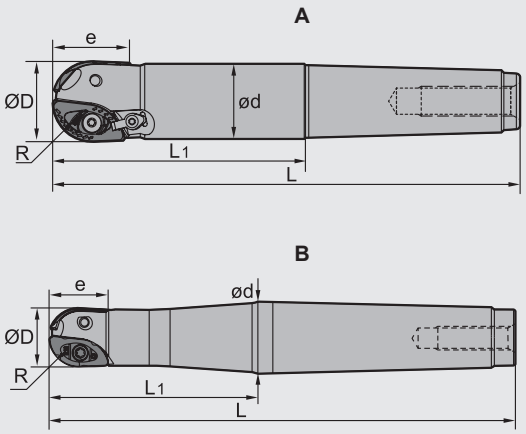
Profil milling tools · Profilfräser



BMR03 P M K



Morse taper shank
Morsekegel Schaft



Specification of tools · Werkzeug Beschreibung

Type · Typ		Stock Lager	Dimensions (mm) · Abmessungen						No. of teeth Zähne	Weight Gewicht (kg)	type	Clamp Pratze
			R	Ø D	ø d	L	L_1	e				
BMR03	**-020-MT3-M**	○	10	20	18.7	156	70	20	2	0.4	B	
	-020-MT3-L	○	10	20	18.7	186	100	20	2	0.4	B	
	-025-MT3-M	○	12.5	25	23.5	156	70	25	2	0.4	B	
	-025-MT3-L	○	12.5	25	23.5	186	100	25	2	0.4	B	
	-030-MT4-M	●	15	30	28.2	189	70	30	2	0.8	A	
	-030-MT4-L	○	15	30	28.2	229	120	30	2	1.0	A	WD-208
	-032-MT4-M	○	16	32	29.2	179	70	32	2	0.9	A	
	-032-MT4-L	●	16	32	29.2	209	100	32	2	0.9	A	
	-040-MT4-M	○	20	40	36.9	199	100	40	2	1.0	A	
	-040-MT5-L	●	20	40	36.9	226	90	40	2	1.8	A	
	-040-MT5-XL	○	20	40	36.9	256	120	40	2	2.0	A	CBH5R1
	-050-MT5-M	●	25	50	46.8	236	100	50	2	2.2	A	
	-050-MT5-L	●	25	50	46.8	286	150	50	2	2.9	A	

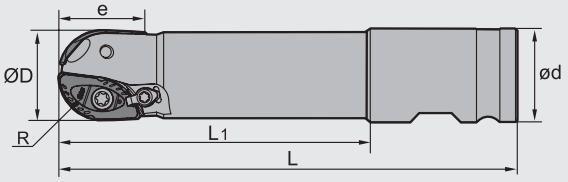
Profil milling tools · Profilfräser



BMR03 P M K



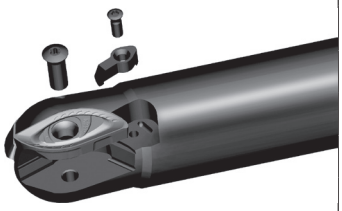
Compound shank



Specification of tools · Werkzeug Beschreibung

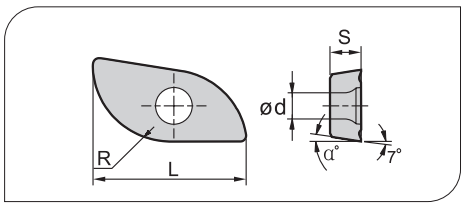
Type · Typ		Stock Lager	Dimensions (mm) · Abmessungen						No. of teeth Zähne	Weight Gewicht (kg)	Clamp Pratze
			R	Ø D	ø d	L	L_1	e			
BMR03	**-040-XPX-M**	○	20	40	50.8	250	170	40	2	1.3	CBH5R1
	-040-XPX-L	○	20	40	50.8	300	220	40	2	3.1	
	-040-XPX-XL	○	20	40	50.8	350	270	40	2	3.5	
	-050-XPX-M	○	25	50	50.8	250	170	50	2	3.1	
	-050-XPX-L	○	25	50	50.8	300	200	50	2	3.8	
	-050-XPX-XL	○	25	50	50.8	350	270	50	2	4.4	

Spare parts · Ersatzteile

Diameter Durchmesser Ø D	Clamp Pratze	Screw Schraube	Wrench Schlüssel		
					
Φ16	--	I60M2.5×6.5	--	WT07P	
Φ20	--	I60M3.5×08TT		WT10IP	
Φ25	--	I60M4×10		WT15S	
Φ30	WD-208	I60M5×13	WT20IT	--	
Φ32	WD-208	I60M5×13			
Φ40	CBH5R1	I43M6×16	WT25IT		
Φ50	CBH5R1	I43M8×21 I43M6×16	WT25IT WT30IT		

● Ex Stock / ab Lager ○ On demand / auf Anfrage

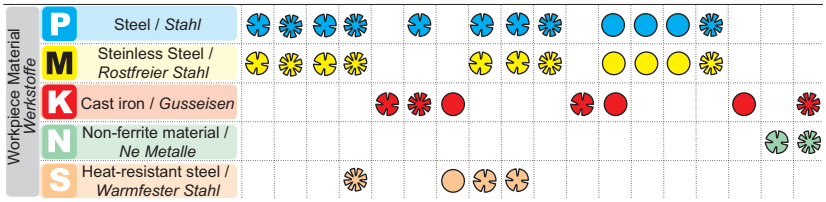
Applicable inserts · Wendeschneidplatten



Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen



Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen						CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		R	d	S	α°	L	Applicable tools	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**XPHT16R0803-GM**	8	3.1	3.18	9	16	Φ16										●								
	XPHT20R10T3-GM	10	4.0	3.97	9	20	Φ20										●								
	XPHT25R1204-GM	12.5	4.7	4.76	9	25	Φ25										●								
	XPHT30R1506-GM	15	5.8	6.35	11	30	Φ30										●								
	XPHT32R1606-GM	16	5.8	6.35	9	32	Φ32										●								
	XPHT40R2007-GM	20	6.8	7.94	9	40	Φ40										○								
	XPHT50R2507-GM	25	9.2	7.94	9	50	Φ50										○								

● Ex Stock / ab Lager ○ On demand / auf Anfrage

BMR03



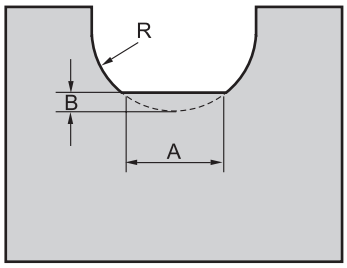
Ball nose end mills
- Serie -
Kugelschaftfräser



- The unique chipbreaker design and big rake angle can effectively control the curling and flow direction of chippings and reduce the cutting force, improve workpiece surface quality and tool life.
- The insert after precisely grinding periphery and locating surface can sufficiently ensure the shape accuracy of cutting edge and the precision of location and installation, improve the reliability of installation and the workpiece precision after machining.
- The concave structure design of flank can effectively enhance the strength of cutting edge, and prevent the scraping between the clearance face and workpiece surface. Therefore it improves the workpiece surface quality and prolongs the life of insert.
- The design of cutting edge over center and a big negative rake angle make it possible to cut vertically, thus the capability of anti-breakage is enhanced.
- The rough ball nose milling cutters with big diameter adopt the top and hole clamping style, insert clamping becomes more firm and stable. The machining also is high efficiency even at the poor condition such as long overhang and large vibration etc.
- The adapter types include straight shank, Weldon shank, Morse taper shank and compound shank.

- Das einzigartige Spanbrecherdesign mit großem Spanwinkel, kontrolliert die Spanbildung und, Spanabfuhr, reduziert die Schnittkräfte und erhöht die Werkzeuglebensdauer.
- Die unfangsgeschliffene Schneidplatte und die Präzision des Plattensitzes sind ein Garant für die Erzielung einer hohen Werkstückqualität.
- Die konkave Schneidengeometrie erhöht die Schneidkantenstabilität und schützt die Schneide vor Ausbrüchen.
- Die Ausführung der Zentrumsschneide und ein großer negativer Spanwinkel ermöglicht eine vertikale Bearbeitung (Zustellung) und stabilisiert das Werkzeug.
- Der Schruppradiusfräser für größere Durchmesser ist neben der Schrauben- mit einer zusätzlichen Pratzenklemmung versehen. Dadurch wird die Schneidplattenklemmung deutlich erhöht. Dies ermöglicht eine effizientere Bearbeitung auch unter ungünstigen Bedingungen, wie langer Auskragung oder bei Vibrationen.
- Durch verschiedene Schaftausführungen kann das Werkzeugsystem auf unterschiedliche Maschinen eingesetzt werden.

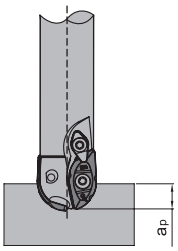
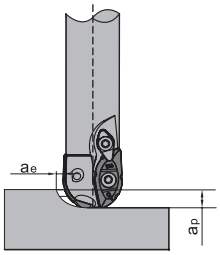
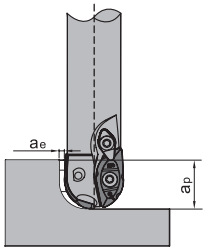
Slot shape after machining
Nut nach der Bearbeitung



R	A	B
08	1.7	0.09
10	2.2	0.12
12.5	3.0	0.18
15	3.9	0.20
16	3.5	0.22
20	3.6	0.24
25	3.8	0.26

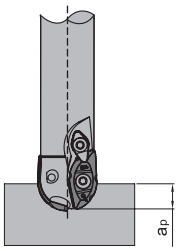
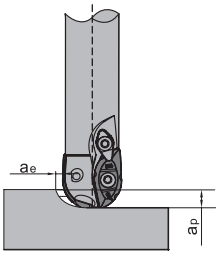
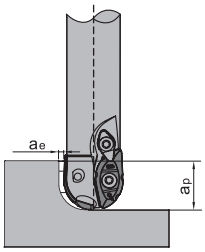
Recommended Cutting data · Schnittdaten

Diameter range
Durchmesser Bereich Ø16

Operations Anwendung						
Workpiece material Werkstück-stoff	Cutting data · Schnittdaten	Machining of slot Nuten Fräsen	Side milling (slight) Schulterfräsen		Side milling (deep) Schulterfräsen	Grade Sorte
Medium carbon steel Kohlenstoff-stahl Hardness Härte 150~250HB	V(m/min)	150~220	150~220	150~220	150~220	YBG302
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a_p(mm)	4	4	8	16	
	a_e(mm)	--	3	4	1.5	
Alloy steel leg. Stahl Hardness Härte 150~280HB	V(m/min)	100~150	100~150	100~150	100~150	
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a_p(mm)	4	4	8	16	
	a_e(mm)	--	3	4	1.5	
Die steel Gesenkstahl Hardness Härte 150~255HB	V(m/min)	80~120	80~120	80~120	80~120	
	Fz(mm/z)	0.1~0.3	0.1~0.3	0.1~0.3	0.1~0.3	
	a_p(mm)	4	4	8	16	
	a_e(mm)	--	3	4	1.5	
Hardened steel gehärteter Stahl Hardness Härte 40~50HRC	V(m/min)	80~100	80~100	80~100	--	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	--	
	a_p(mm)	4	4	8	--	
	a_e(mm)	--	2	3	--	
Grey Cast iron Grausguss Hardness Härte 160~260HB	V(m/min)	250~300	250~300	250~300	250~300	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a_p(mm)	4	4	8	16	
	a_e(mm)	--	3	4	1.5	
Nodular Cast iron Kugelgrafitguss Hardness Härte 170~300HB	V(m/min)	200~250	200~250	200~250	200~250	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a_p(mm)	4	4	8	16	
	a_e(mm)	--	3	4	1.5	

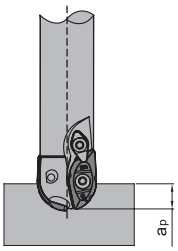
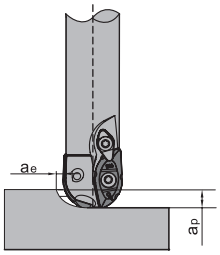
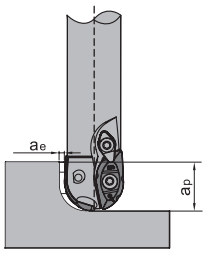
Recommended Cutting data · Schnittdaten

Diameter range Ø20

Operations Anwendung					
Workpiece material Werkstück-stoff	Cutting data · Schnittdaten	Machining of slot Nuten Fräsen	Side milling (slight) Schulterfräsen		Side milling (deep) Schulterfräsen	Grade Sorte
Medium carbon steel Kohlenstoff-stahl Hardness Härte 150~250HB	V(m/min)	150~220	150~220	150~220	150~220	YBG302
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a_p(mm)	5	5	10	20	
	a_e(mm)	--	4	5	2	
Alloy steel leg. Stahl Hardness Härte 150~280HB	V(m/min)	100~150	100~150	100~150	100~150	
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a_p(mm)	5	5	10	20	
	a_e(mm)	--	4	5	2	
Die steel Gesenkstahl Hardness Härte 150~255HB	V(m/min)	80~120	80~120	80~120	80~120	
	Fz(mm/z)	0.1~0.3	0.1~0.3	0.1~0.3	0.1~0.3	
	a_p(mm)	5	5	10	20	
	a_e(mm)	--	4	5	2	
Hardened steel gehärteter Stahl Hardness Härte 40~50HRC	V(m/min)	80~100	80~100	80~100	--	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	--	
	a_p(mm)	5	5	10	--	
	a_e(mm)	--	4	5	--	
Grey Cast iron Grausguss Hardness Härte 160~260HB	V(m/min)	250~300	250~300	250~300	250~300	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a_p(mm)	5	5	10	20	
	a_e(mm)	--	4	5	2	
Nodular Cast iron Kugelgrafitguss Hardness Härte 170~300HB	V(m/min)	200~250	200~250	200~250	200~250	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a_p(mm)	5	5	10	20	
	a_e(mm)	--	4	5	2	

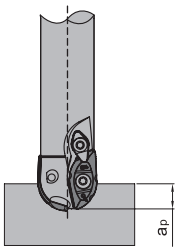
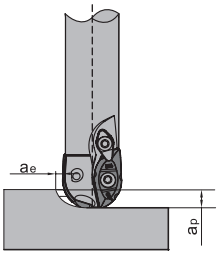
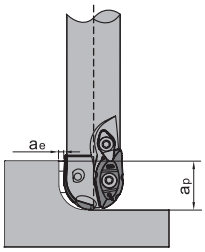
Recommended Cutting data · Schnittdaten

Diameter range
Durchmesser Bereich Ø25

Operations Anwendung					
Workpiece material Werkstück-stoff	Cutting data · Schnittdaten	Machining of slot Nuten Fräsen	Side milling (slight) Schulterfräsen		Side milling (deep) Schulterfräsen	Grade Sorte
Medium carbon steel Kohlenstoff-stahl Hardness Härte 150~250HB	V(m/min)	150~220	150~220	150~220	150~220	YBG302
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a_p(mm)	6	6	12.5	25	
	a_e(mm)	--	5	6.5	3	
Alloy steel leg. Stahl Hardness Härte 150~280HB	V(m/min)	100~150	100~150	100~150	100~150	
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a_p(mm)	6	6	12.5	25	
	a_e(mm)	--	5	6.5	3	
Die steel Gesenkstahl Hardness Härte 150~255HB	V(m/min)	80~120	80~120	80~120	80~120	
	Fz(mm/z)	0.1~0.3	0.1~0.3	0.1~0.3	0.1~0.3	
	a_p(mm)	6	6	12.5	25	
	a_e(mm)	--	5	6.5	3	
Hardened steel gehärteter Stahl Hardness Härte 40~50HRC	V(m/min)	80~100	80~100	80~100	--	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	--	
	a_p(mm)	6	6	12.5	--	
	a_e(mm)	--	5	6.5	--	
Grey Cast iron Grausguss Hardness Härte 160~260HB	V(m/min)	250~300	250~300	250~300	250~300	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a_p(mm)	6	6	12.5	25	
	a_e(mm)	--	5	6.5	3	
Nodular Cast iron Kugelgrafitguss Hardness Härte 170~300HB	V(m/min)	200~250	200~250	200~250	200~250	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a_p(mm)	6	6	12.5	25	
	a_e(mm)	--	5	6.5	3	

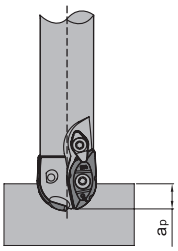
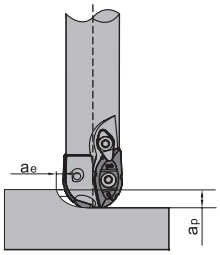
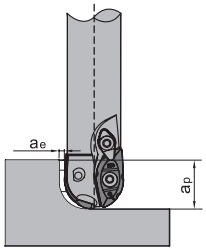
Recommended Cutting data · Schnittdaten

Diameter range
Durchmesser Bereich Ø30, Ø32

Operations Anwendung						
Workpiece material Werkstück-stoff	Cutting data · Schnittdaten	Machining of slot Nuten Fräsen	Side milling (slight) Schulterfräsen		Side milling (deep) Schulterfräsen	Grade Sorte
Medium carbon steel Kohlenstoff-stahl Hardness Härte 150~250HB	V(m/min)	150~220	150~220	150~220	150~220	YBG302
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a_p(mm)	10	10	16	28	
	a_e(mm)	--	6	9	6	
Alloy steel leg. Stahl Hardness Härte 150~280HB	V(m/min)	100~150	100~150	100~150	100~150	
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a_p(mm)	10	10	16	28	
	a_e(mm)	--	6	9	6	
Die steel Gesenkstahl Hardness Härte 150~255HB	V(m/min)	80~120	80~120	80~120	80~120	
	Fz(mm/z)	0.1~0.3	0.1~0.3	0.1~0.3	0.1~0.3	
	a_p(mm)	10	10	16	28	
	a_e(mm)	--	6	9	6	
Hardened steel gehärteter Stahl Hardness Härte 40~50HRC	V(m/min)	80~100	80~100	80~100	--	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	--	
	a_p(mm)	10	10	16	--	
	a_e(mm)	--	6	9	--	
Grey Cast iron Grausguss Hardness Härte 160~260HB	V(m/min)	250~300	250~300	250~300	250~300	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a_p(mm)	10	10	16	28	
	a_e(mm)	--	6	9	6	
Nodular Cast iron Kugelgrafitguss Hardness Härte 170~300HB	V(m/min)	200~250	200~250	200~250	200~250	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a_p(mm)	10	10	16	28	
	a_e(mm)	--	6	9	6	

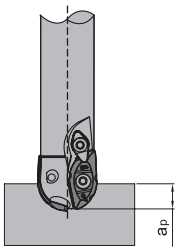
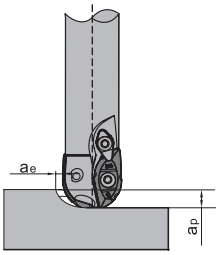
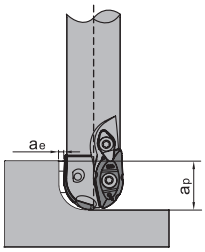
Recommended Cutting data · Schnittdaten

Diameter range
Durchmesser Bereich Ø40

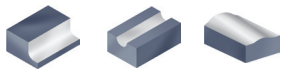
Workpiece material Werkstück-stoff	Cutting data · Schnittdaten	Operations Anwendung: Machining of slot Nuten Fräsen	Side milling (slight) Schulterfräsen		Side milling (deep) Schulterfräsen	Grade Sorte
						
Medium carbon steel Kohlenstoff-stahl Hardness Härte 150~250HB	V(m/min)	150~220	150~220	150~220	150~220	YBG302
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a_p(mm)	12	10	20	35	
	a_e(mm)	--	8	12	8	
Alloy steel leg. Stahl Hardness Härte 150~280HB	V(m/min)	100~150	100~150	100~150	100~150	
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a_p(mm)	12	10	20	35	
	a_e(mm)	--	8	12	8	
Die steel Gesenkstahl Hardness Härte 150~255HB	V(m/min)	80~120	80~120	80~120	80~120	
	Fz(mm/z)	0.1~0.3	0.1~0.3	0.1~0.3	0.1~0.3	
	a_p(mm)	12	10	20	35	
	a_e(mm)	--	8	12	8	
Hardened steel gehärteter Stahl Hardness Härte 40~50HRC	V(m/min)	80~100	80~100	80~100	--	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	--	
	a_p(mm)	12	10	20	--	
	a_e(mm)	--	8	12	--	
Grey Cast iron Grausguss Hardness Härte 160~260HB	V(m/min)	250~300	250~300	250~300	250~300	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a_p(mm)	12	10	20	35	
	a_e(mm)	--	8	12	8	
Nodular Cast iron Kugelgrafitguss Hardness Härte 170~300HB	V(m/min)	200~250	200~250	200~250	200~250	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a_p(mm)	12	10	20	35	
	a_e(mm)	--	8	12	8	

Recommended Cutting data · Schnittdaten

Diameter range
Durchmesser Bereich Ø50

Operations Anwendung						
Workpiece material Werkstück-stoff	Cutting data · Schnittdaten	Machining of slot Nuten Fräsen	Side milling (slight) Schulterfräsen		Side milling (deep) Schulterfräsen	Grade Sorte
Medium carbon steel Kohlenstoff-stahl Hardness Härte 150~250HB	V(m/min)	150~220	150~220	150~220	150~220	YBG302
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a_p(mm)	15	10	25	40	
	a_e(mm)	--	10	15	10	
Alloy steel leg. Stahl Hardness Härte 150~280HB	V(m/min)	100~150	100~150	100~150	100~150	
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a_p(mm)	15	10	25	40	
	a_e(mm)	--	10	15	10	
Die steel Gesenkstahl Hardness Härte 150~255HB	V(m/min)	80~120	80~120	80~120	80~120	
	Fz(mm/z)	0.1~0.3	0.1~0.3	0.1~0.3	0.1~0.3	
	a_p(mm)	15	10	25	40	
	a_e(mm)	--	10	15	10	
Hardened steel gehärteter Stahl Hardness Härte 40~50HRC	V(m/min)	80~100	80~100	80~100	--	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	--	
	a_p(mm)	15	10	25	--	
	a_e(mm)	--	10	15	--	
Grey Cast iron Grausguss Hardness Härte 160~260HB	V(m/min)	250~300	250~300	250~300	250~300	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a_p(mm)	15	10	25	40	
	a_e(mm)	--	10	15	10	
Nodular Cast iron Kugelgrafitguss Hardness Härte 170~300HB	V(m/min)	200~250	200~250	200~250	200~250	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a_p(mm)	15	10	25	40	
	a_e(mm)	--	10	15	10	

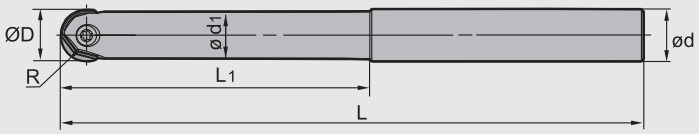
Profil milling tools · Profilfräser



BMR04 P M K



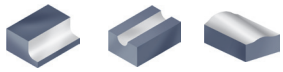
Straigth shank
Zylinder Schaft



Specification of tools · Werkzeug Beschreibung

Type · Typ		Stock Lager	Dimensions (mm) · Abmessungen						Weight Gewicht (kg)
			R	Ø D	ø d	ø d_1	L_1	L	
BMR04	**-012-G12-M**	●	6	12	12	11	35	125	0.1
	-012-G12-L	●	6	12	12	11	45	150	0.1
	-016-G16-M	●	8	16	16	14	40	150	0.2
	-016-G16-L	●	8	16	16	14	55	180	0.3
	-020-G20-M	●	10	20	20	18	65	180	0.4
	-020-G20-L	●	10	20	20	18	100	250	0.6
	-025-G25-M	●	12.5	25	25	23	70	200	0.7
	-025-G25-L	●	12.5	25	25	23	100	250	0.9
	-030-G32-M	●	15	30	32	27	80	250	1.2
	-030-G32-L	●	15	30	32	27	110	300	1.5
	-032-G32-M	●	16	32	32	29	80	250	1.4
	-032-G32-L	●	16	32	32	29	110	300	1.7

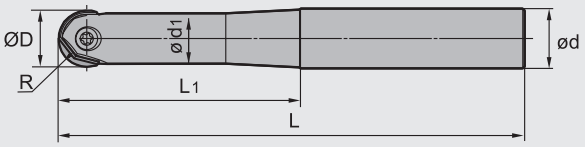
Profil milling tools · Profilfräser



BMR04 P M K



Straight shank
Zylinderschaft



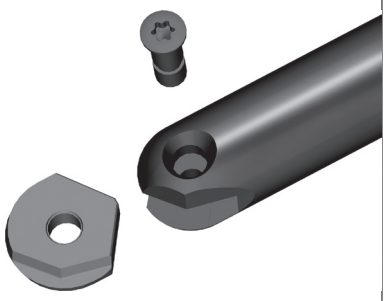
Specification of tools · Werkzeug Beschreibung

Type · Typ		Stock Lager	Dimensions (mm) · Abmessungen						Weight Gewicht (kg)
			R	Ø D	ø d	ø d_1	L_1	L	
BMR04	**-012-G16-M**	●	6	12	16	11	50	125	0.2
	-012-G16-L	●	6	12	16	11	70	150	0.2
	-016-G20-M	●	8	16	20	14	60	150	0.3
	-016-G20-L	●	8	16	20	14	80	180	0.3
	-020-G25-M	●	10	20	25	18	75	180	0.6
	-020-G25-L	●	10	20	25	18	95	200	0.6
	-025-G32-M	●	12.5	25	32	23	90	200	1.0
	-025-G32-L	●	12.5	25	32	23	110	250	1.3
	-030-G40-M	●	15	30	40	27	110	250	2.0
	-030-G40-L	●	15	30	40	27	125	300	2.4
	-032-G40-M	●	16	32	40	29	110	250	2.0
	-032-G40-L	●	16	32	40	29	125	300	2.4

● Ex Stock / ab Lager ○ On demand / auf Anfrage

Spare parts · Ersatzteile

Diameter Durchmesser Ø D	Screw Schraube	Wrench Schlüssel	
Ø12	I70M4×10TT	WT15IP	--
Ø16	I70M5×12TT	WT20IP	--
Ø20	I70M5×16TT	WT20IP	--
Ø25	I70M6×20TT	WT20IP	--
Ø30	I70M8×25TT	--	WT30IT
Ø32	I70M8×25TT	--	WT30IT

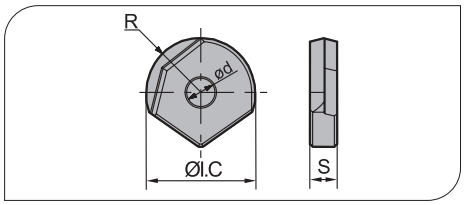


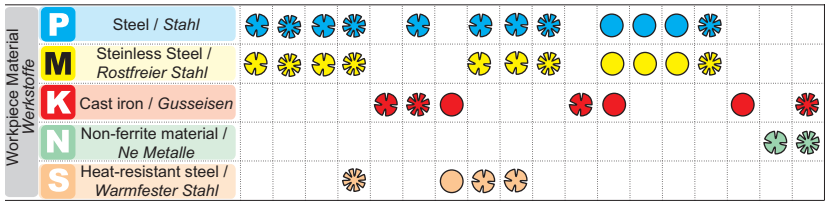
Applicable inserts · Wendeschneidplatten

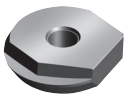
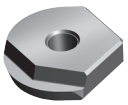
Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen

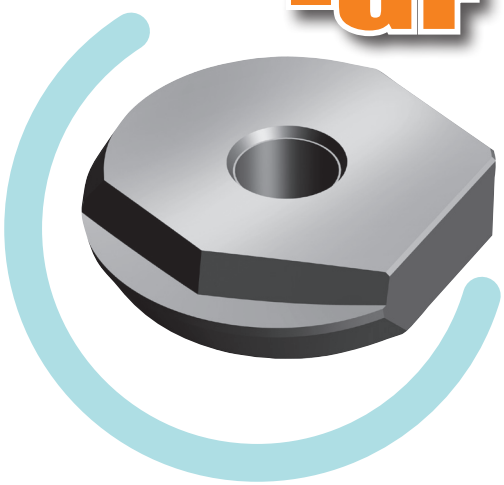




Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		R	I.C	S	d	Applicable insert Ø D	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**ZOHX1203-GF**	6	12	3	4	Φ12												●						
	ZOHX1604-GF	8	16	4	5	Φ16												●						
	ZOHX2005-GF	10	20	5	5	Φ20												●						
	ZOHX2506-GF	12.5	25	6	6	Φ25												●						
	ZOHX3007-GF	15	30	7	8	Φ30												●						
	ZOHX3207-GF	16	32	7	8	Φ32												●						
	**ZOHX1203-GM**	6	12	3	4	Φ12												●						
	ZOHX1604-GM	8	16	4	5	Φ16												●						
	ZOHX2005-GM	10	20	5	5	Φ20												●						
	ZOHX2506-GM	12.5	25	6	6	Φ25												●						
	ZOHX3007-GM	15	30	7	8	Φ30												●						
	ZOHX3207-GM	16	32	7	8	Φ32												●						

BMR04

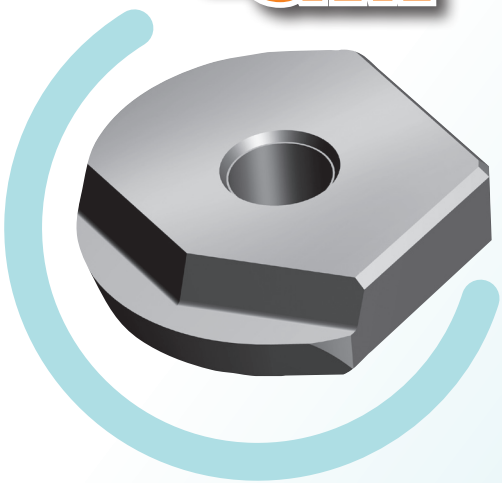
-GF



Positive rake angle and double clearance angle, the design of curved cutting edge take both sharpness and strength into consideration. The edge with high precision is applicable in the stable machining condition and the condition with high precision demand for workpiece profile.

Das spezielle Design aus positivem Spanwinkel und doppeltem Freiwinkel ermöglicht sowohl eine scharfe wie auch stabile Schneidkantenausführung. Die GF-Geometrie eignet sich besonders für Hochpräzisions- und Schlichtbearbeitung unter stabilen Maschinenbedingungen.

-GM



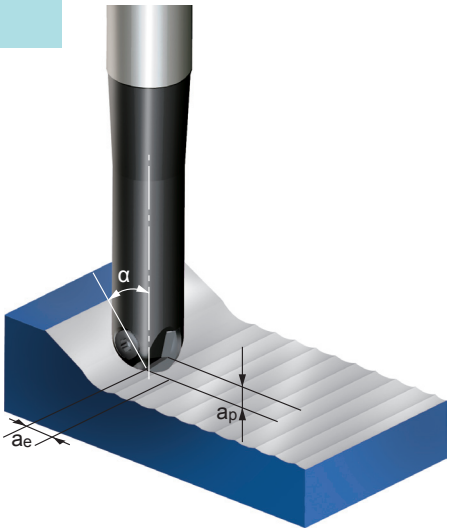
0° rake angle, only one clearance angle, high edge strength. Suitable for the machining condition requiring high cutting efficiency.

0° Grad Spanwinkel mit definiertem Freiwinkel ergeben eine sehr stabile Schneidkante. Für mittlere Bearbeitung mit hoher Effizienz.

The grade YBG 252 is a perfect combination of ultra fine grain carbide substrate and nano PVD-Coating.

Die Sorte YBG 252 ist die ideale Kombination von ultra Feinkorn-Hartmetallsubstrat und einer nano PVD-Beschichtung.

Calculation of cutting data for ball nose endmills (BMR02/04 series)
Kalkulation der Schnittdaten für Kugelkopffräser (BMR02/04)



1.when tool axial line is vertical to the machined surface

axiale Werkzeugachse zur vertikalen Fräsfläche:

$$N = \frac{1000Vc}{\pi Dc}(r/min)$$

$$Dc = 2\sqrt{a_p(D-a_p)}$$

N: revolution/min · Umdrehung/min

Vc: real cutting speed · effektive Schnittgeschwindigkeit

Dc: effective cutting diameter · effektive Ø

D: tool nominal diameter · nominale Ø

a_p: axial cutting depth · axiale Schnitttiefe

2. When there is a inclined angle between the tool axial line and the machined surface, the recommended cutting speed should be multiplied by a factor in the follow table to obtain the cutting speed used for programming

2. Unter Berücksichtigung des Neigungswinkel, (Werkzeugachse/ bearbeitenden Oberfläche) erhalten Sie die empfohlene Schnittgeschwindigkeit, durch in der Tabelle angegeben Multiplikator.

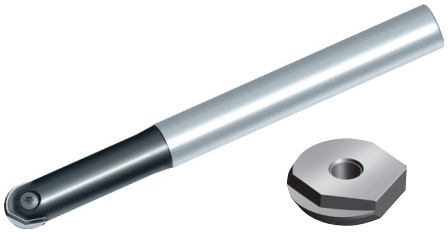
Diameter (mm) Ø		Ø12		Ø16		Ø20		Ø25		Ø30		Ø32	
depth of cut Schnitttiefe a_p(mm)		0.2	0.5	0.2	0.5	0.5	1	0.5	1	0.5	1.5	0.5	1.5
Inclined angle Neigungs-winkel α	15°	1.00	1.00	1.00	1.00	1.00	1.02	1.00	1.01	1.00	1.00	1.00	1.00
	30°	1.04	1.01	1.05	1.01	1.02	1.04	1.03	1.04	1.04	1.01	1.04	1.00
	45°	1.16	1.07	1.18	1.10	1.12	1.06	1.14	1.08	1.16	1.06	1.16	1.06
	60°	1.42	1.24	1.47	1.30	1.34	1.21	1.38	1.25	1.42	1.21	1.43	1.22
	75°	2.02	1.60	2.14	1.73	1.83	1.53	1.93	1.62	2.01	1.53	2.04	1.55
	90°	3.92	2.50	4.48	2.87	3.20	2.29	3.57	2.55	3.9	2.29	4.03	2.37

Recommended Cutting data · Schnittdaten

Workpiece material Werkstück-stoff		Hardness HB	Grade Sorte	Cutting data · Schnittdaten	Tool specification					
					Ø12	Ø16	Ø20	Ø25	Ø30	Ø32
P	carbon steel leg. Kohlenstoff-stahl	HB≤180	YBG252	V(m/min)	100~200	100~200	100~200	100~200	100~200	100~200
				fz(mm/z)	0.15~0.25	0.2~0.3	0.2~0.3	0.25~0.35	0.25~0.35	0.25~0.35
				a_{pmax}(mm)	0.8	1	1.25	1.5	2	2
				a_{emax}(mm)	0.8	1	1.25	1.5	2	2
	Alloy steel Leg. Stahl	HB180~280		V(m/min)	80~180	80~180	80~180	80~180	80~180	80~180
				fz(mm/z)	0.15~0.25	0.2~0.3	0.2~0.3	0.25~0.35	0.25~0.35	0.25~0.35
				a_{pmax}(mm)	0.8	1	1.25	1.5	2	2
				a_{emax}(mm)	0.8	1	1.25	1.5	2	2
	Hardened steel gehärteter Stahl	HRC55~65		V(m/min)	60~100	60~100	60~100	60~100	60~100	60~100
				fz(mm/z)	0.15~0.25	0.2~0.3	0.2~0.3	0.25~0.35	0.25~0.35	0.25~0.35
				a_{pmax}(mm)	0.4	0.5	0.6	0.8	1	1
				a_{emax}(mm)	0.4	0.5	0.6	0.8	1	1
M	Stainless steel Rostfreier Stahl	HB≤270		V(m/min)	70~150	70~150	70~150	70~150	70~150	70~150
				fz(mm/z)	0.1~0.2	0.1~0.25	0.1~0.25	0.2~0.3	0.2~0.3	0.2~0.3
				a_{pmax}(mm)	0.6	0.8	1	1.25	1.5	1.5
				a_{emax}(mm)	0.6	0.8	1	1.25	1.5	1.5
K	Cast iron Gusseisen	HB180-250		V(m/min)	160~300	160~300	160~300	160~300	160~300	160~300
				fz(mm/z)	0.2~0.3	0.25~0.35	0.25~0.35	0.3~0.4	0.3~0.4	0.3~0.4
				a_{pmax}(mm)	1	1.5	1.8	2	2.5	2.5
				a_{emax}(mm)	1	1.5	1.8	2	2.5	2.5

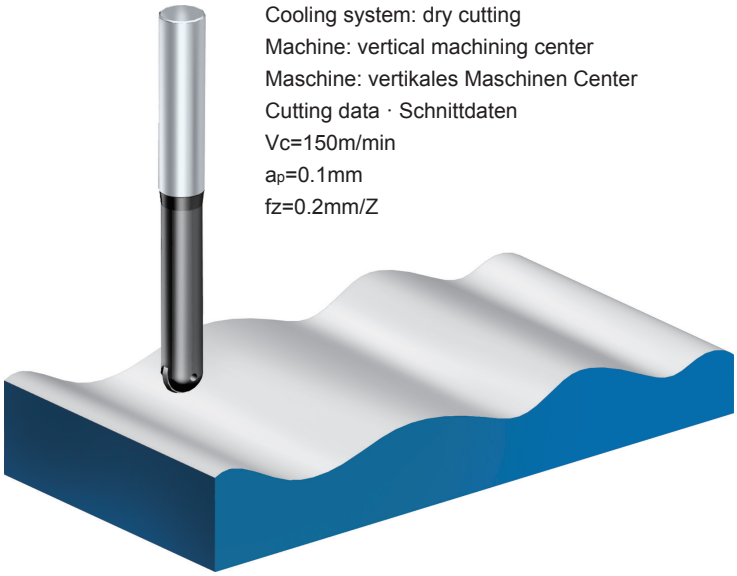
● Ex Stock / ab Lager ○ On demand / auf Anfrage

Case study for BMR04
Bearbeitungsbeispiel für BMR04

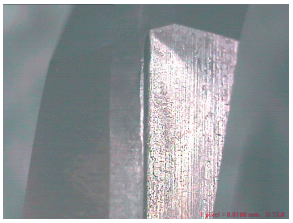
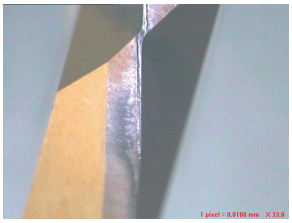
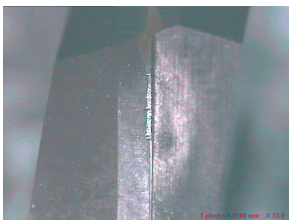
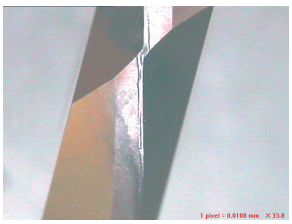


■ToolWerkzeug: BMR04-020-G25-M
■Insert type/grade: ZOHX2005-GM/YBG252

Workpiece material
Werkstück-
stoff: 42CrMo (HRC35)
Cooling system: dry cutting
Machine: vertical machining center
Maschine: vertikales Maschinen Center
Cutting data · Schnittdaten
Vc=150m/min
a_p=0.1mm
fz=0.2mm/Z

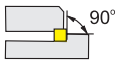
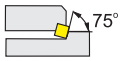
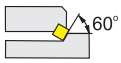
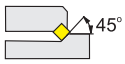
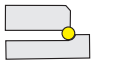


●Abrasion comparison of inserts after milling curved face

	ZCC-CT	Other company product
60minutes later		
	Flank abrasion0.08	Flank abrasion0.10
120minutes later		
	Flank abrasion0.12	Flank abrasion0.16

Side and face milling tools · Scheiben- und Planfräser code key

Milling tool type Fräsertyp	
FM	Face milling Planfräsen
EM	Square shoulder milling /Eckfräsen
HM	Helical end milling Spiralfräsen
SM	Side and face milling Eck- und Planfräsen
BM	Profile milling Profilfräsen
CM	Chamfer milling Fasfräsen
XM	Special milling Spezialfräsen

Approach angle Anstellwinkel		
P	90°	
E	75°	
D	60°	
A	45°	
R		

Sequence number of series
Serien Nummer

Cutting diameter ØD (mm)
Fräserdurchmesser

Cutting width of milling tools
Schnittbreite

Coupling structure and demension Aufnahmetyp			
A	A type	D	D type
B	B type	K	Mounting by keyway
C	C type		

SM P 03 - 160 × 16 - K40

- M P 12 - 12 L

Insert · WSP	
C	Diamond with 80°
D	Diamond with 55°
R	Round
S	Square
T	Regular triangle
V	Diamond with 35°
M	Diamond with 86°

Insert clearance angle Freiwinkel	
N	0°
B	5°
C	7°
P	11°
D	15°
E	20°

Length of cutting edge Schneidkantenlänge						
Diameter of IC	Insert · WSP					
	C	D	R	S	T	V
5.556	—	—	—	—	09	—
6.350	06	07	—	—	11	—
9.525	09	11	09	09	16	16
12.700	12	15	12	12	22	22
15.875	16	19	15	15	27	—
19.050	19	—	19	19	33	—
25.400	25	—	25	25	44	—

Cutting direction
Schnittrichtung

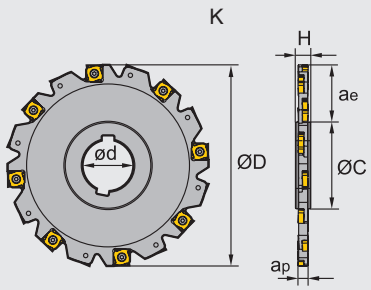
(R: right L: left)
(R: rechts L: links)

Number of teeth
Zähnezahl

Side and face milling tools · Scheibenfräser

SMP01 P M K



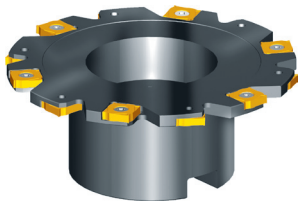


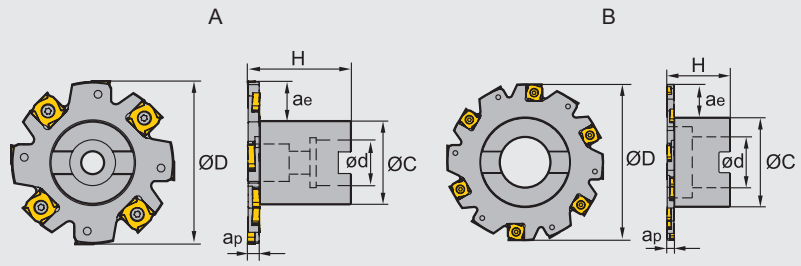
Specification of tools · Werkzeug Beschreibung

Type · Typ		Stock Lager R	Stock Lager L	Dimensions (mm) · Abmessungen Ø D	ø d	ø c	H	a_p	a_{emax}	Inserts WSP	No. of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)
SMP01 Mounting by keyway	**-100×4-K27-SN12-10**	○	○	100	27	40.7	12	4	25		10	K	0.2
	-125×4-K40-SN12-12	○	○	125	40	50.5	12	4	32	XSEQ1202	12	K	0.3
	-160×4-K40-SN12-16	○	○	160	40	66.7	12	4	44		16	K	0.5
	-100×5-K27-SN12-10	○	○	100	27	45	12	5	25		10	K	0.2
	-125×5-K40-SN12-12	○	○	125	40	58	12	5	31	XSEQ1203	12	K	0.3
	-160×5-K40-SN12-16	○	○	160	40	68	12	5	44		16	K	0.6
	-100×6-K27-SN12-10	○	○	100	27	45	12	6	25		10	K	0.3
	-125×6-K40-SN12-12	○	○	125	40	58	12	6	31		12	K	0.4
	-160×6-K40-SN12-16	○	○	160	40	68	12	6	44	XSEQ12T3	16	K	0.7
	-200×6-K50-SN12-18	○	○	200	50	67.7	12	6	62		18	K	1.1
	-250×6-K50-SN12-24	○	○	250	50	72	12	6	87		24	K	1.7
	-100×7-K27-SN12-10	○	○	100	27	45	12	7	25		10	K	0.3
	-125×7-K40-SN12-12	○	○	125	40	58	12	7	31		12	K	0.4
	-160×7-K40-SN12-16	○	○	160	40	68	12	7	44	XSEQ1204	16	K	0.8
	-200×7-K50-SN12-18	○	○	200	50	72	12	7	62		18	K	1.2
	-250×7-K50-SN12-24	○	○	250	50	72	12	7	87		24	K	1.9
	-100×8-K27-SN12-10	○	○	100	27	45	12	8	25		10	K	0.3
	-125×8-K40-SN12-12	○	○	125	40	58	12	8	31		12	K	0.5
	-160×8-K40-SN12-16	○	○	160	40	68	12	8	44	XSEQ12T4	16	K	0.9
	-200×8-K50-SN12-18	○	○	200	50	72	12	8	62		18	K	1.4
	-250×8-K50-SN12-24	○	○	250	50	72	12	8	87		24	K	2.2

Side and face milling tools · Scheibenfräser

SMP01 P M K



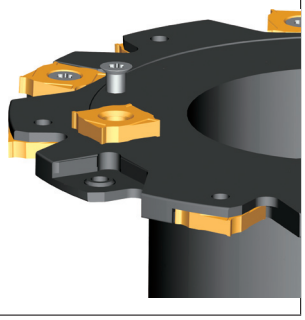


Specification of tools · Werkzeug Beschreibung

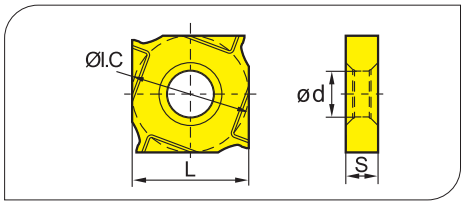
Type · Typ		Stock Lager R	Stock Lager L	Dimensions (mm) · Abmessungen Ø D	ø d	ø c	H	ap	aemax	Inserts WSP	No. of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)
SMP01 Arbor mounting	**-063×4-A22-SN12-06**	○	○	63	22	40	50	4	10		6	A	0.2
	-080×4-A22-SN12-08	○	○	80	22	40	50	4	18	XSEQ1202	8	A	0.4
	-100×4-A27-SN12-10	○	○	100	27	48	50	4	23		10	A	0.6
	-063×5-A22-SN12-06	○	○	63	22	40	50	5	10		6	A	0.2
	-080×5-A22-SN12-08	○	○	80	22	40	50	5	18	XSEQ1203	8	A	0.4
	-100×5-A27-SN12-10	○	○	100	27	48	50	5	23		10	A	0.7
	-063×6-A22-SN12-06	○	○	63	22	40	50	6	10		6	A	0.2
	-080×6-A22-SN12-08	○	○	80	22	40	50	6	18		8	A	0.5
	-100×6-A27-SN12-10	○	○	100	27	48	50	6	23	XSEQ12T3	10	A	0.7
	-125×6-B40-SN12-12	○	○	125	40	70	50	6	24		12	B	1.0
	-160×6-B40-SN12-16	○	○	160	40	70	50	6	41		16	B	1.3
	-063×7-A22-SN12-06	○	○	63	22	40	50	7	10		6	A	0.2
	-080×7-A22-SN12-08	○	○	80	22	40	50	7	18		8	A	0.5
	-100×7-A27-SN12-10	○	○	100	27	48	50	7	23	XSEQ1204	10	A	0.7
	-125×7-B40-SN12-12	○	○	125	40	70	50	7	24		12	B	1.1
	-160×7-B40-SN12-16	○	○	160	40	70	50	7	41		16	B	1.4
	-063×8-A22-SN12-06	○	○	63	22	40	50	8	10		6	A	0.2
	-080×8-A22-SN12-08	○	○	80	22	40	50	8	18		8	A	0.5
	-100×8-A27-SN12-10	○	○	100	27	48	50	8	23	XSEQ12T4	10	A	0.8
	-125×8-B40-SN12-12	○	○	125	40	70	50	8	24		12	B	1.1
	-160×8-B40-SN12-16	○	○	160	40	70	50	8	41		16	B	1.5

● Ex Stock / ab Lager ○ On demand / auf Anfrage

Spare parts · Ersatzteile

Diameter Durchmesser Ø D	Cutting width a_p	Screw Schraube	Wrench Schlüssel	
				
Ø63-Ø160	4	I91M4×3.3X	WT10S	
Ø63-Ø160	5	I91M4×4.3X		
Ø63-Ø250	6	I91M4×5.3X		
Ø63-Ø250	7	I91M4×6.3X		
Ø63-Ø250	8	I91M4×7.3X		

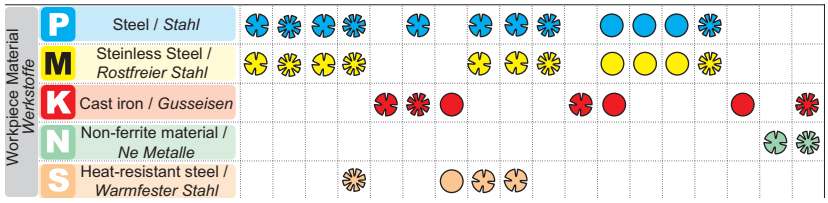
Applicable inserts · Wendeschneidplatten



Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen



Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen				CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		I.C	L	S	d	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**XSEQ1202**	12.7	12.7	2.6	5.0										○								
	XSEQ1203	12.7	12.7	3.0	5.0										○								
	XSEQ12T3	12.7	12.7	3.8	5.0	○									○								
	XSEQ1204	12.7	12.7	4.0	5.0										○								
	XSEQ12T4	12.7	12.7	4.8	5.0																		

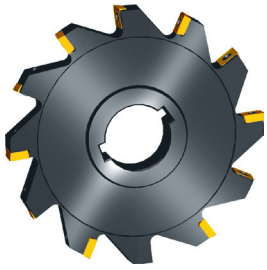
Recommended Cutting data · Schnittdaten

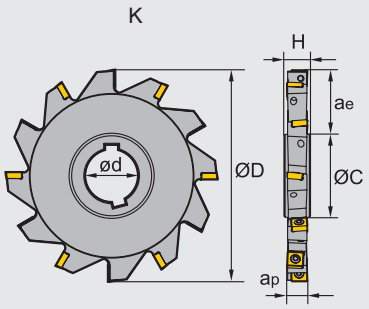
Workpiece material Werkstück-stoff		Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten	
				V(m/min)	f(mm/z)
P	Low-carbon steel Soft steel Niedrig legierter Kohlenstoffstahl Baustahl	≤180	YBG202	180 (100-250)	0.1(0.08-0.25)
			YBG302	150 (100-200)	0.15(0.1-0.3)
	High-carbon steel Alloy steel Hoch Leg. Kohlenstoffstahl Leg. Stahl	180-280	YBG202	150 (80-250)	0.1(0.08-0.25)
			YBG302	120 (80-200)	0.15(0.1-0.3)
	Alloy tool steel Leg. Werkzeugstahl	280-350	YBG202	120 (80-250)	0.1(0.08-0.25)
			YBG302	100 (80-200)	0.15(0.1-0.3)
M	Stainless steel Rostfreier Stahl	≤270	YBG202	120 (80-250)	0.1(0.05-0.15)
			YBG302	100 (80-200)	0.08(0.05-0.15)
K	Cast iron Gusseisen	180-250	YBG152	120 (80-250)	0.1(0.05-0.15)
			YBG302	150 (100-250)	0.08(0.05-0.15)

● Ex Stock / ab Lager ○ On demand / auf Anfrage

Side and face milling tools · Scheibenfräser

SMP03 P M K



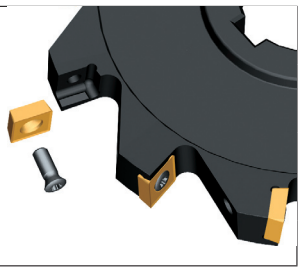


Specification of tools · Werkzeug Beschreibung

Type · Typ		Stock Lager R	Stock Lager L	Dimensions (mm) · Abmessungen Ø D	ø c	ø d	a_{emax}	a_p	H	Inserts WSP	No. of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)
SMP03 Mounting by keyway	**-080×8-K27-MP06-10**	○	○	80	41	27	17	8	12	MPHT060304-DM	10	K	0.2
	-100×8-K32-MP06-14	○	○	100	47	32	25	8	12		14	K	0.3
	-100×10-K32-MP06-14	○	○	100	47	32	25	10	14		14	K	0.4
	-125×10-K40-MP06-16	○	○	125	55	40	34	10	14		16	K	0.6
	-125×12-K40-MP08-12	○	○	125	55	40	34	12	16	MPHT080305-DM	12	K	0.7
	-160×12-K40-MP08-14	○	○	160	62	40	47	12	16		14	K	1.3
	-160×16-K40-MP12-12	○	○	160	62	40	49	16	20	MPHT120408-DM	12	K	1.6
	-160×18-K40-MP12-12	○	○	160	62	40	49	18	24		12	K	1.9
	-160×20-K40-MP12-12	○	○	160	62	40	49	18	26		12	K	2.1
	-200×16-K50-MP12-14	○	○	200	72	50	62	16	20		14	K	2.5
	-200×18-K50-MP12-14	○	○	200	72	50	62	18	24		14	K	2.9
	-200×20-K50-MP12-14	○	○	200	72	50	63	20	26		14	K	3.3

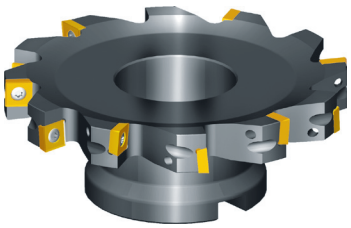
Spare parts · Ersatzteile

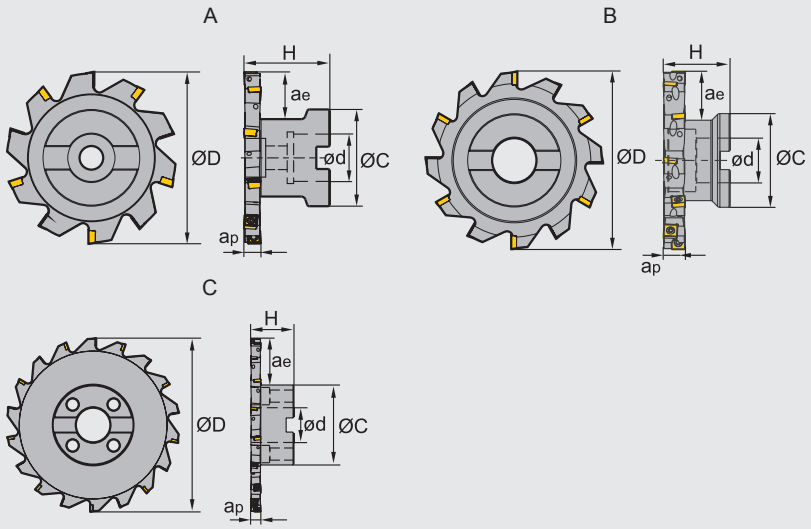
Diameter Durchmesser Ø D	Insert	Screw Schraube	Wrench Schlüssel	
				
Ø80-Ø125	MP06	I60M2.5x6.5	WT07IP	
Ø125-Ø160	MP08	I60M3x7	WT09P	
Ø160-Ø200	MP12	I60M5x13		WT20IS



Side and face milling tools · Scheibenfräser

SMP03 P M K



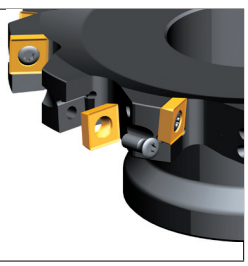


Specification of tools · Werkzeug Beschreibung

Type · Typ		Stock Lager		Dimensions (mm) · Abmessungen						Inserts WSP	No. of teeth Zähne	Applicable inserts	Weight Gewicht (kg)
		R	L	Ø D	ø c	ø d	a_{emax}	a_p	H				
SMP03 Arbor mounting	**-080×8-A22-MP06-10**	○	○	80	45	22	21	8	40	MPHT060304-DM	10	A	0.4
	-100×8-B27-MP06-14	○	○	100	55	27	24	8	40		14	B	0.6
	-100×10-B27-MP06-14	○	○	100	55	27	24	10	40		14	B	0.7
	-125×10-B32-MP06-16	○	○	125	65	32	33	10	45		16	B	1.1
	-125×12-B32-MP08-12	○	○	125	65	32	33	12	45	MPHT080305-DM	12	B	1.4
	-160×12-B40-MP08-14	○	○	160	80	40	45	12	50		14	B	1.9
	-200×12-C40-MP08-18	○	○	200	92	40	53	12	50		18	C	3.2
	-125×16-B32-MP12-10	○	○	125	65	32	30	16	50	MPHT120408-DM	10	B	2.3
	-160×16-B40-MP12-12	○	○	160	80	40	45	16	60		12	B	2.3
	-160×18-B40-MP12-12	○	○	160	80	40	45	18	60		12	B	2.4
	-200×16-C40-MP12-14	○	○	200	92	40	53	16	50		14	C	3.6
	-200×18-C40-MP12-14	○	○	200	92	40	53	18	50		14	C	3.9
	-200×20-C40-MP12-14	○	○	200	92	40	53	20	50		14	C	4.2

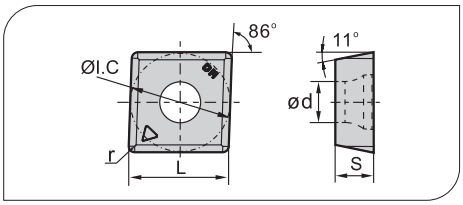
Spare parts · Ersatzteile

Diameter Durchmesser Ø D	Insert	Screw Schraube	Wrench Schlüssel	
				
Ø80-Ø125	MP06	I60M2.5×6.5	WT07IP	
Ø125-Ø200	MP08	I60M3×7	WT09P	
Ø125-Ø200	MP12	I60M5×13		WT20IS

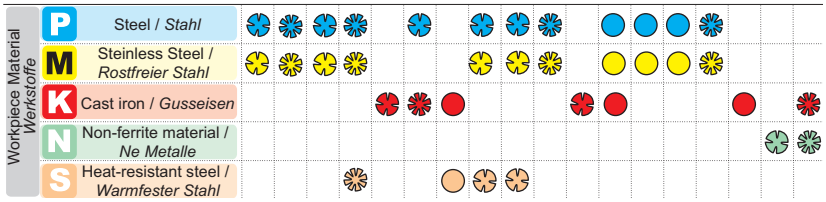


● Ex Stock / ab Lager ○ On demand / auf Anfrage

Applicable inserts · Wendeschneidplatten



Ideal Machining Condition
Gute Bearbeitungsbedingungen
Normal Machining Condition
Normale Bearbeitungsbedingungen
Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen

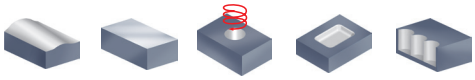


Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		I.C	L	S	d	r	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**MPHT060304-DM**	6.35	6.35	3.18	2.8	0.4			●							●								
	MPHT080305-DM	8.3	8.3	3.18	5.56	0.5			●							○								
	MPHT120408-DM	12.7	12.7	4.76	5.56	0.8			●							●								

Recommended Cutting data · Schnittdaten

Workpiece material Werkstück-stoff		Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten	
				V(m/min)	f(mm/z)
P	Low-carbon steel Soft steel Niedrig legierter Kohlenstoffstahl Baustahl	≤180	YBG202	180 (100-250)	0.1(0.08-0.25)
			YBG302	150 (100-200)	0.15(0.1-0.3)
	High-carbon steel Alloy steel Hoch Leg. Kohlenstoffstahl Leg. Stahl	180-280	YBG202	150 (80-250)	0.1(0.08-0.25)
			YBG302	120 (80-200)	0.15(0.1-0.3)
	Alloy tool steel Leg. Werkzeugstahl	280-350	YBG202	120 (80-250)	0.1(0.08-0.25)
			YBG302	100 (80-200)	0.15(0.1-0.3)
M	Stainless steel Rostfreier Stahl	≤270	YBG202	120 (80-250)	0.1(0.05-0.15)
			YBG302	100 (80-200)	0.08(0.05-0.15)
K	Cast iron Gusseisen	180-250	YBG152	120 (80-250)	0.1(0.05-0.15)
			YBG302	150 (100-250)	0.08(0.05-0.15)

Applicable tool Werkzeug B9-B15
Tools code key Werkzeug ISO B24-B25
Grade selection guide Sortenauswahl B17-23
Technical data Technische Daten B182-B188

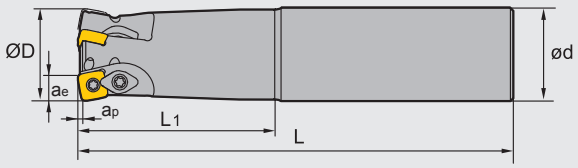


High feed milling cutters · Hochvorschubfräser

XMR01 P M K



S type insert, straight shank
S Typ WSP, Zylinder Schaft



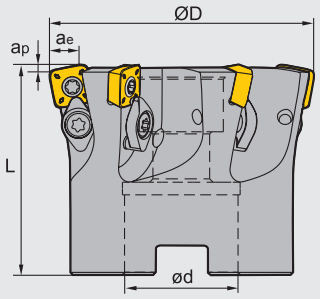
Specification of tools · Werkzeug Beschreibung with Internal Cooling · Mit Innenkühlung

Type · Typ		Stock Lager	Dimensions (mm) · Abmessungen						No. of teeth Zähne	Weight Gewicht (kg)
			Ø D	a_p	a_e	L_1	L	Ø d		
XMR01	**-025-G25-SD09-02**	●	25	1.4	8.8	60	140	25	2	0.5
	-032-G32-SD09-03	●	32	1.4	8.8	70	150	32	3	0.8
	-035-G32-SD09-03	○	35	1.4	8.8	70	150	32	3	0.8
	-032-G32-SD12-02	●	32	1.8	11.7	70	150	32	2	0.8
	-040-G40-SD12-03	●	40	1.8	11.7	70	150	40	3	1.3

XMR01 P M K



S



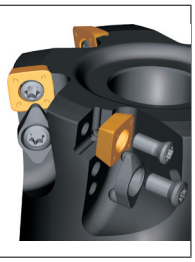
Specification of tools · Werkzeug Beschreibung with Internal Cooling · mit Innenkühlung

Type · Typ		Stock Lager	Dimensions (mm) · Abmessungen					No.of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)
			Ø D	a_p	a_e	L	ø d			
XMR01	**-050-A22-SD09-04**	●	50	1.4	8.8	40	22	4	A	0.3
	-063-A22-SD09-06	●	63	1.4	8.8	40	22	6	A	0.5
	-063-A27-SD09-06	○	63	1.4	8.8	50	27	6	A	0.6
	-063-A22-SD12-05	●	63	1.8	11.7	40	22	5	A	0.5
	-063-A27-SD12-05	○	63	1.8	11.7	50	27	5	A	0.6
	-080-A27-SD12-05	●	80	1.8	11.7	63	27	5	A	0.9
	-100-B32-SD12-06	●	100	1.8	11.7	50	32	6	B	1.8

● Ex Stock / ab Lager ○ On demand / auf Anfrage

Spare parts · Ersatzteile

Tool Werkzeug	Insert Screw Schraube	Clamp Screw Schraube	Clamp Pratze	Wrench Schlüssel	
XMR01**-SD09**	I60M3.5×08TT	I60M4×8.4	WD-204	WT10IP	WT15IP
XMR01**-SD12**	I60M4×8.4			WT15IP	

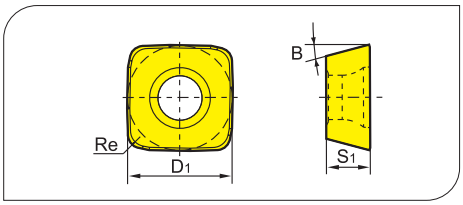


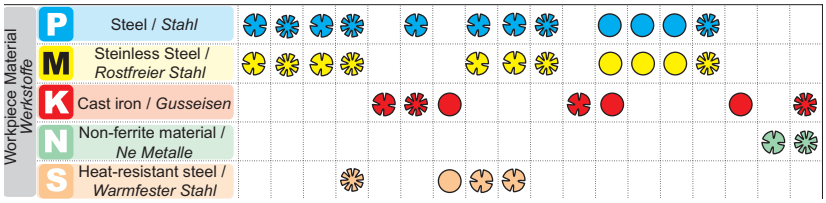
Applicable inserts · Wendeschneidplatten

Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

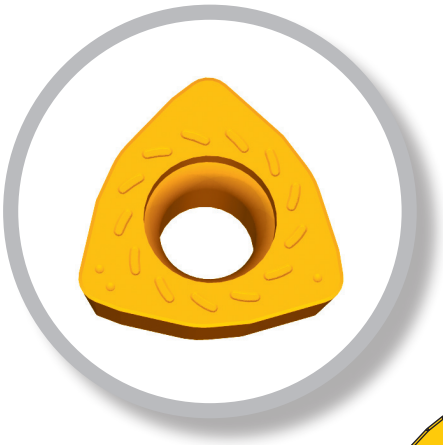
Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen

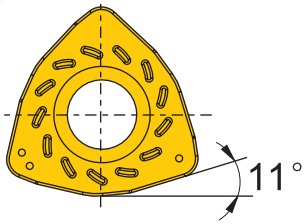


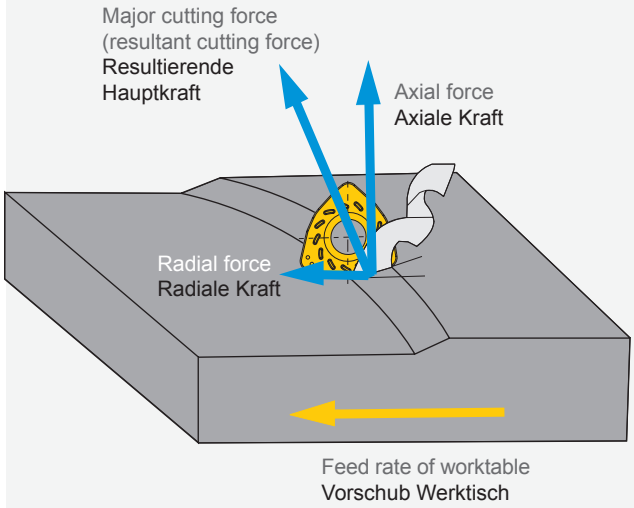


Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen				CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		B	Re	S_1	D_1	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**SDMT09T312-DM**	15°	1.2	3.97	9.525				●		●		●		●								
	SDMT120412-DM	15°	2.0	4.76	12.7				●		●		●		●								

XMR01 series high feed milling tools
Hochvorschubfräser





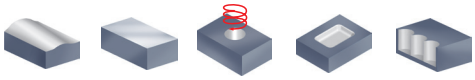


The feature of high feed tool is to resolve the major cutting force into the axial direction, greatly reduce the radial cutting force, thus improve tool's capability of shock resistance. In addition, this structure can effectively reduce the vibration in long overhang milling application.



Die Merkmale dieses Hochvorschubfräsers sind die Ablenkung der Hauptkraft in axiale Richtung. Dadurch wird die radiale Kraft deutlich verringert, was eine Reduzierung oder Vibration ermöglicht und somit lange Standzeiten auch bei größeren Auskraglängen zur Folge hat.

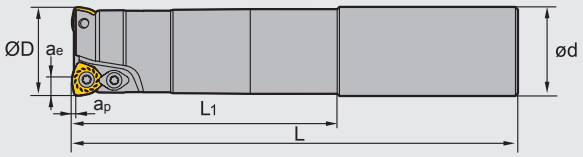
High feed milling cutters · Hochvorschubschaftfräser



XMR01 P M K



W type insert, straight shank
W Typ WSP, Zylinder Schaft



Specification of tools · Werkzeug Beschreibung

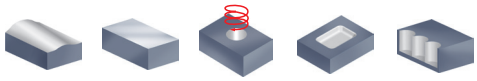
Type · Typ		Stock Lager	Dimensions (mm) · Abmessungen						No. of teeth Zähne	Weight Gewicht (kg)
			Ø D	a_p	a_e	L_1	L	ø d		
XMR01	**-020-G20-WP05-02-M**	●	20	1.5	3.8	50	130	20	2	0.2
	-020-G20-WP05-02-L	●	20	1.5	3.8	100	180	20	2	0.3
	-020-G20-WP05-02-XL	○	20	1.5	3.8	130	250	20	2	0.8
	-025-G25-WP06-02-M	●	25	1.5	4.35	60	140	25	2	0.4
	-025-G25-WP06-02-L	○	25	1.5	4.35	120	200	25	2	0.6
	-025-G25-WP06-02-XL	○	25	1.5	4.35	180	300	25	2	1.0
	-032-G32-WP06-03-M	○	32	1.5	4.35	70	150	32	3	0.8
	-032-G32-WP06-03-L	●	32	1.5	4.35	120	200	32	3	1.0
	-032-G32-WP06-03-XL	○	32	1.5	4.35	180	300	32	3	1.6
	-040-G32-WP06-03-M	○	40	1.5	4.35	50	150	32	3	0.9
	-040-G32-WP06-03-L	○	40	1.5	4.35	50	250	32	3	1.5
	-040-G32-WP06-03-XL	○	40	1.5	4.35	50	300	32	3	1.8
	-040-G32-WP08-02-M	○	40	1.5	5.66	50	150	32	2	0.9
	-040-G32-WP08-02-L	○	40	1.5	5.66	50	250	32	2	1.5
	-040-G32-WP08-02-XL	○	40	1.5	5.66	50	300	32	2	1.9
	-050-G32-WP09-02-M	○	50	3.0	6.8	50	150	32	2	1.9
	-050-G32-WP09-02-L	○	50	3.0	6.8	50	250	32	2	2.5

Spare parts · Ersatzteile

Tool Werkzeug	Clamp/Insert Screw Schraube	Clamp Pratze	Wrench Schlüssel	
XMR01**-WP05**	I60M3.5×08TT	--	WT10P	--
XMR01**-WP06**	I60M4×8.4		WT15P	
XMR01**-WP08**	I60M5×13	WD-208	--	WT20IT
XMR01**-WP09**				



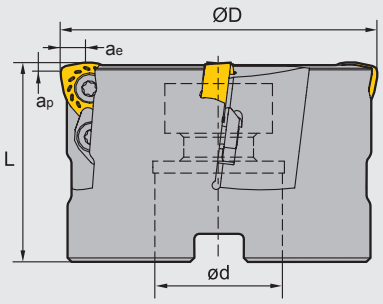
High feed milling cutters · Hochvorschubfräser



XMR01 P M K



W type insert, Arbor mounting
W Typ WSP, Aufsteckfräser



Specification of tools · Werkzeug Beschreibung

Type · Typ		Stock Lager	Dimensions (mm) · Abmessungen					No. of teeth Zähne	Inserts WSP	Weight Gewicht (kg)
			Ø D	a_p	a_e	L	ø d			
XMR01	**-050-A22-WP06-04**	○	50	1.5	4.35	50	22	4	A	0.4
	-050-A22-WP08-03	○	50	1.5	5.66	50	22	3	A	0.4
	-063-A22-WP08-04	●	63	1.5	5.66	50	22	4	A	0.7
	-063-A27-WP08-04	○	63	1.5	5.66	50	27	4	A	0.7
	-080-A27-WP08-05	●	80	1.5	5.66	63	27	5	A	1.5
	-100-B32-WP08-06	○	100	1.5	5.66	63	32	6	B	2.2
	-125-B40-WP08-07	●	125	1.5	5.66	63	40	7	B	3.5
	-160-B40-WP08-08	○	160	1.5	5.66	63	40	8	B	6.0
	-063-A22-WP09-03	○	63	3.0	6.8	50	22	3	A	0.7
	-080-A27-WP09-04	○	80	3.0	6.8	63	27	4	A	1.4
	-100-B32-WP09-05	○	100	3.0	6.8	63	32	5	B	2.1
	-125-B40-WP09-06	○	125	3.0	6.8	63	40	6	B	3.7
	-160-B40-WP09-07	○	160	3.0	6.8	63	40	7	B	6.3

Spare parts · Ersatzteile

Tool Werkzeug	Clamp / Insert Screw Pratze / WSP Schraube	Clamp Pratze	Wrench Schlüssel	
				
XMR01**-WP06**	I60M4×8.4	--	WT15S	--
XMR01**-WP08**	I60M5×13	WD-208	--	WT20IT
XMR01**-WP09**	I60M5×13	WD-208	--	



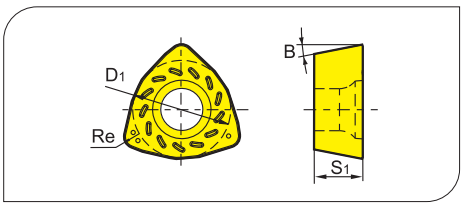
● Ex Stock / ab Lager ○ On demand / auf Anfrage

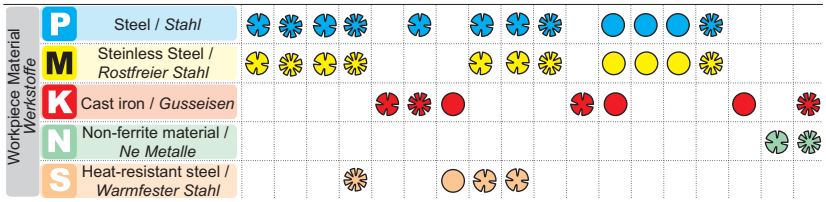
Applicable inserts · Wendeschneidplatten

Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen





Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen				CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		B	Re	S_1	D_1	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**WPGT050315ZSR**	11°	1.5	3.5	7.94				●														
	WPGT060415ZSR	11°	1.5	4.2	9.525				●														
	WPGT080615ZSR	11°	1.5	6.35	12.85				●					●									
	WPGT090725ZSR	11°	2.5	7	15				●														

Applicable tool B9-B15
Werkzeug

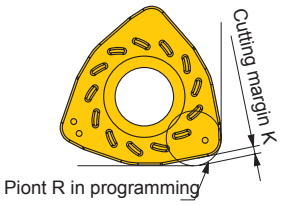
Tools code key B24-B25
Werkzeug ISO

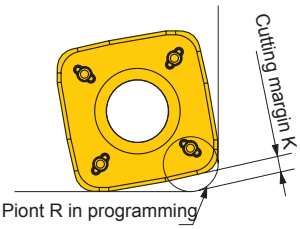
Grade selection guide B17-23
Sortenauswahl

Technical data B182-B188
Technische Daten

Approximate R in machining program
Ungefährer Programmierradius

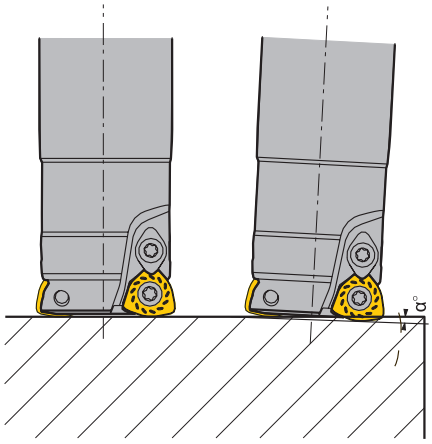
Insert · WSP	approx./ca. R(mm)	Cutting margin K(mm)
WPGT050315ZSR	2	0.5
WPGT060415ZSR	2.5	0.7
WPGT080615ZSR	2.0	0.7
WPGT090725ZSR	4.0	1.2
SDMT09T312-DM	2.5	0.87
SDMT120412-DM	4.0	0.93



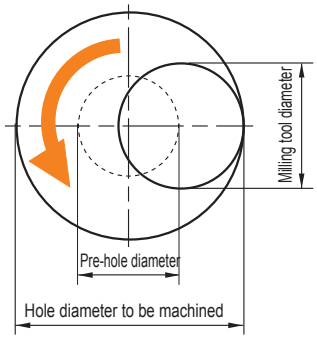


Different machining styles

■ Ramp machining
Tauchfräsen



■ Helical interpolation milling
Zirkularfräsen



- Reduce the feed rate in ramp and helical machining operations.
- Set the axial feed rate below 0.2mm/rev in drilling operation.
- Be careful ! Long chippings may fly out in drilling operation.
- The cutting depth of each rotation can't exceed the maximum cutting depth (a_p)
- The S type insert not only is applied in the machining operations mentioned above, but also able to be used for plunge milling.

- Beim Tauch- und Zirkularfräsen den Vorschub reduzieren.
- Vorschub bei Bohroperationen (achsial) unter 0,2 mm einstellen.
- "Vorsicht“ – Beim Bohren können lange Späne entstehen.
- Die Schnitttiefe pro Rotation kann die maximale Schnitttiefe ap nicht erreichen.
- Die S-Type Wendeschneidplatten können auch für andere Bearbeitungsoperationen eingesetzt werden.

XMR01-Serie

XMR01 series tools (install SD**inserts) possess perfect edge strength and excellent economical efficiency, have more advantages in face milling.
XMR01 series tools (install WP**inserts) possess good capability of chip removal, have more advantages in cavity milling.

Werkzeuge mit Schneidplatten (SD**) besitzen ausgezeichnete Schneidkantenstabilität. Sie haben besondere Vorteile beim Planfräsen mit hoher Wirtschaftlichkeit.

Werkzeuge mit Schneidplatten (WP..) haben besondere Vorteile bei der Spanabfuhr und werden vorteilhaft beim Auskoffern eingesetzt.

● Ex Stock / ab Lager ○ On demand / auf Anfrage

Recommended Cutting data · Schnittdaten

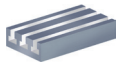
Workpiece material Werkstück-stoff		Hardness HB Härte	Grade Sorte	Cutting speed Schnitt-geschw. (m/min)	Ø25		Ø30/32/35	
					Axial cutting depth	Feed rate per tooth	Axial cutting depth	Feed rate per tooth
P	carbon steel Soft steel legierter Kohlenstoffstahl Baustahl	≤HB180 HB180-280	YBM351	170(120-220) 150(100-200)	0.6~1.0	0.8~1.2	0.8~1.2	1.0~1.4
P	Alloy steel Leg. Stahl Alloy tool steel Leg. Werkzeugstahl	HB280-350 ≤HB350	YBM351	130(80-180)	0.4~0.8	0.8~1.2	0.6~1.0	1.0~1.4
P	hardened steel gehärteter Stahl	≤HRC35	YBM351	120(80-160)	0.4~0.8	0.6~1.0	0.6~1.0	0.8~1.2
M	Stainless steel Rostfreier Stahl	≤HB270	YBM351	120(80-160)	0.6~1.0	0.6~1.0	0.8~1.2	0.8~1.2
K	cast Iron Gusseisen	Tensile strength ≤350MPa	YBG302	150(100-200)	0.6~1.0	1.0~1.4	0.8~1.2	1.2~1.6
K	Nodular Cast iron Kugelgrafitguss Temperguss	Tensile strength ≤800MPa	YBG302	120(80-160)	0.4~0.8	0.8~1.2	0.6~1.0	1.0~1.4

Recommended Cutting data · Schnittdaten

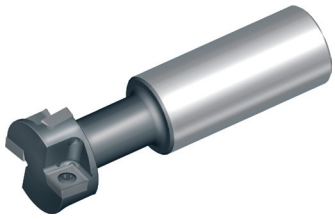
Workpiece material Werkstück-stoff		Hardness HB Härte	Grade Sorte	Cutting speed Schnitt-geschw. (m/min)	Ø40		Ø50/63		Ø80/100	
					Axial cutting depth	Feed rate per tooth	Axial cutting depth	Feed rate per tooth	Axial cutting depth	Feed rate per tooth
P	carbon steel Soft steel legierter Kohlenstoffstahl Baustahl	≤HB180 HB180-280	YBM351	170(120-220) 150(100-200)	0.8~1.2	1.0~1.4	1.1~1.5	1.1~1.5	1.0~1.5	1.0~1.5
P	Alloy steel Leg. Stahl Alloy tool steel Leg. Werkzeugstahl	HB280-350 ≤HB350	YBM351	130(80-180)	0.6~1.0	1.0~1.4	0.9~1.3	1.1~1.5	0.8~1.3	1.0~1.5
P	hardened steel gehärteter Stahl	≤HRC35	YBM351	120(80-160)	0.6~1.0	0.8~1.2	0.9~1.3	0.9~1.3	0.8~1.3	0.8~1.3
M	Stainless steel Rostfreier Stahl	≤HB270	YBM351	120(80-160)	0.8~1.2	0.8~1.2	1.1~1.5	0.9~1.3	1.0~1.5	0.8~1.3
K	cast Iron Gusseisen	Tensile strength ≤350MPa	YBG302	150(100-200)	0.8~1.2	1.2~1.6	1.1~1.5	1.3~1.7	1.0~1.5	1.2~1.7
K	Nodular Cast iron Kugelgrafitguss Temperguss	Tensile strength ≤800MPa	YBG302	120(80-160)	0.6~1.0	1.0~1.4	0.9~1.3	1.1~1.5	0.8~1.3	1.0~1.5

T-slot milling tools · T-Nuten Fräser

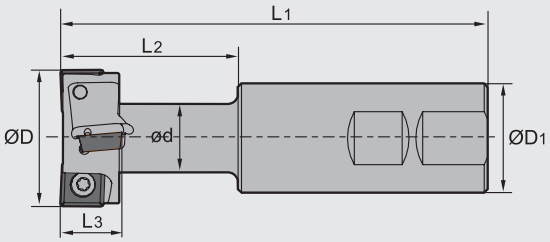
Kr:90°



TMP01 K



Weldon shank
Weldon Schaft

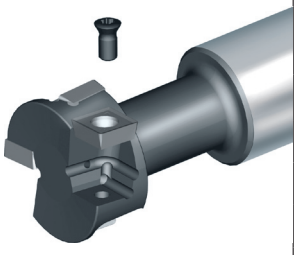


Specification of tools · Werkzeug Beschreibung

Type · Typ		Stock Lager	Dimensions (mm) · Abmessungen						No. of teeth Zähne	Number of insert Anzahl WSP	T-slot specification
			Ø D	Ø D_1	ø d	L_1	L_2	L_3			
TMP01	**-021-XP25-MP06-01**	●	21	25	10	100	32	9	1	2	12
	-025-XP25-MP06-01	●	25	25	12	100	35	11	1	2	14
	-032-XP32-MP08-02	●	32	32	15	110	45	14	2	4	18
	-040-XP32-MP12-02	●	40	32	19	125	55	18	2	4	22
	-050-XP40-MP12-02	●	50	40	25	140	65	22	2	4	28
	-060-XP50-MP12-02	●	60	50	32	160	80	28	2	6	36

Spare parts · Ersatzteile

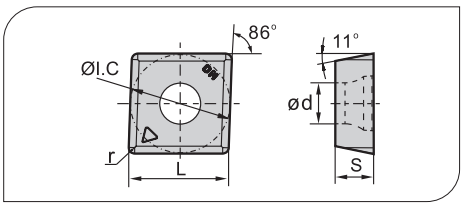
Tool Werkzeug	Screw Schraube	Wrench Schlüssel	
			
TMP01-021-XP25-MP06-01	I60M2.5×5.5	WT07IP	--
TMP01-025-XP25-MP06-01	I60M2.5×5.5		
TMP01-032-XP32-MP08-02	I60M3×7	WT10IP	--
TMP01-040-XP32-MP12-02	I60M5×10	--	WT20IT
TMP01-050-XP40-MP12-02	I60M5×10		
TMP01-060-XP50-MP12-02	I60M5×10		

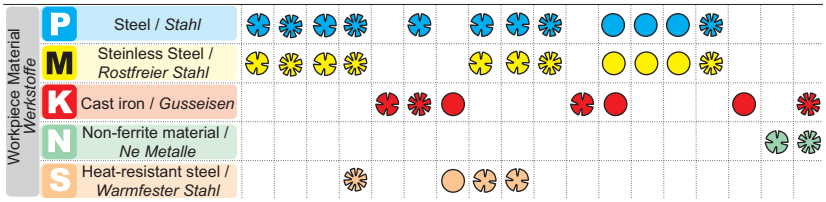


● Ex Stock / ab Lager ○ On demand / auf Anfrage

Applicable inserts · Wendeschneidplatten

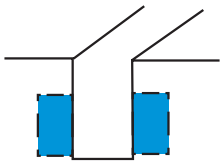
Ideal Machining Condition
Gute Bearbeitungsbedingungen
Normal Machining Condition
Normale Bearbeitungsbedingungen
Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen





Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		I.C	L	s	d	r	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**MPHT060304-DM**	6.35	6.35	3.18	2.8	0.4			●							●								
	MPHT080305-DM	8.3	8.3	3.18	3.4	0.5			●							○								
	MPHT120408-DM	12.7	12.7	4.76	5.56	0.8			●							●								

Workpiece before machining
Werktisch vor der Bearbeitung



Recommended Cutting data · Schnittdaten

Workpiece material Werkstückstoff	Grade Sorte	Cutting data · Schnittdaten		
		V(m/min)	f(mm/z)	Cooling
K	YBG302	80~160	0.05~0.2	Wet / Dry Nass/ Trocken

Applicable tool B9-B15 Werkzeug
Tools code key B24-B25 Werkzeug ISO
Grade selection guide B17-23 Sortenauswahl
Technical data B182-B188 Technische Daten

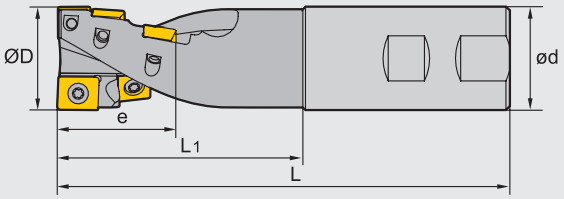
Helical end mill · Walzenstirnfräser

Kr:90°

HMP01 P K



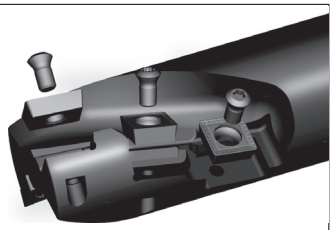
Weldon shank
Weldon Schaft



Specification of tools · Werkzeug Beschreibung

Type · Typ		Stock Lager		Dimensions (mm) · Abmessungen					Number of flute	Number of insert Anzahl WSP		Shank type Schaft
		R	L	Ø D	ø d	e	L_1	L	Z	APKT 150412-**	SPMT 120408-**	
HMP01	**-040×55-XP40-SP12-02**	○	○	40	40	55	95	175	2	1	5	Weldon
	-050×55-XP40-SP12-04	○	○	50	40	55	95	175	4	2	10	Weldon

Spare parts · Ersatzteile

Diameter Durchmesser Ø D	Screw Schraube	Wrench Schlüssel	
			
Ø40	I60M5×10	WT20IS	
Ø50	I60M5×13	WT20IS	

● Ex Stock / ab Lager ○ On demand / auf Anfrage

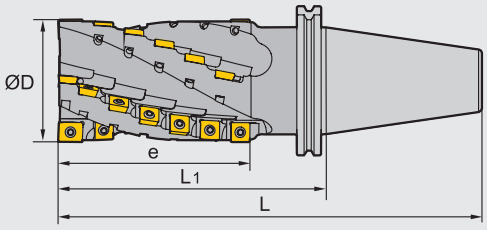
Helical end mill · Walzenstirnfräser

Kr:90°

HMP01 P K



JT shank/BT shank (figure is JT shank)
JT Schaft/BT Schaft (Abb. is JT shank)

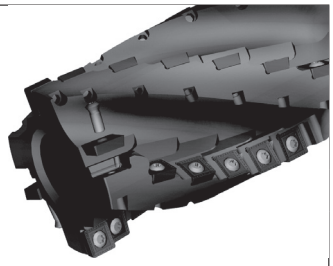


Specification of tools · Werkzeug Beschreibung

Type · Typ		Stock Lager		Dimensions (mm) · Abmessungen				Number of flute Zähne Z	Number of insert Anzahl WSP		Shank type Schaft
		R	L	Ø D	e	L_1	L		APKT 150412-**	SPMT 120408-**	
HMP01	**-050×84-JT50-SP12-04**	○	○	50	84	145	246.75	4	2	16	JT
	-063×74-JT50-SP12-04	○	○	63	74	135	236.75	4	2	14	JT
	-063×104-JT50-SP12-04	○	○	63	104	165	266.75	4	2	20	JT
	-063×134-JT50-SP12-04	○	○	63	134	195	296.75	4	2	26	JT
	-080×104-JT50-SP12-04	○	○	80	104	165	266.75	4	2	20	JT
	-080×144-JT50-SP12-04	○	○	80	144	205	306.75	4	2	28	JT
	-050×84-BT50-SP12-04	○	○	50	84	145	246.8	4	2	16	BT
	-063×74-BT50-SP12-04	○	○	63	74	135	236.8	4	2	14	BT
	-063×104-BT50-SP12-04	○	○	63	104	165	266.8	4	2	20	BT
	-063×134-BT50-SP12-04	○	○	63	134	195	296.8	4	2	26	BT
	-080×104-BT50-SP12-04	○	○	80	104	165	266.8	4	2	20	BT
	-080×144-BT50-SP12-04	○	○	80	144	205	306.8	4	2	28	BT

Spare parts · Ersatzteile

Diameter Durchmesser Ø D	Screw Schraube	Wrench Schlüssel
Ø50	I60M5×13	WT20IS
Ø63	I60M5×13	WT20IS
Ø80	I60M5×13	WT20IS

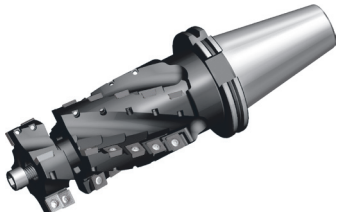


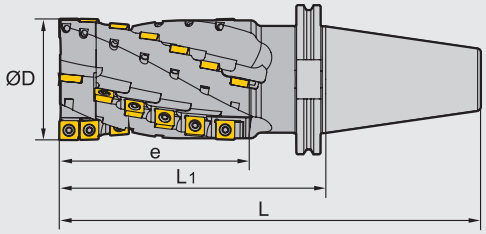
Helical endmills with interchangeable heads
Walzenstirnfräser mit austauschbarem Kopf

Kr:90°



HMP01 EC P K



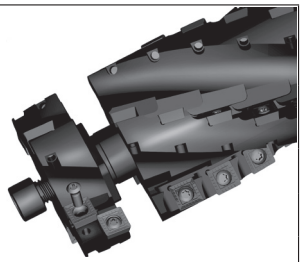


Specification of tools · Werkzeug Beschreibung

Type · Typ		Stock Lager		Dimensions (mm) · Abmessungen				Number of flute Zähne Z	Number of insert Anzahl WSP		Shank type Schaft
		R	L	Ø D	e	L_1	L		APKT 150412-**	SPMT 120408-**	
HMP01	**-050×84EC-JT50-SP12-04**	○	○	50	84	145	246.75	4	2	16	JT
	-063×74EC-JT50-SP12-04	○	○	63	74	135	236.75	4	2	14	JT
	-063×104EC-JT50-SP12-04	○	○	63	104	165	266.75	4	2	20	JT
	-063×134EC-JT50-SP12-04	○	○	63	134	195	296.75	4	2	26	JT
	-080×104EC-JT50-SP12-04	○	○	80	104	165	266.75	4	2	20	JT
	-080×144EC-JT50-SP12-04	○	○	80	144	205	306.75	4	2	28	JT
	-050×84EC-BT50-SP12-04	○	○	50	84	145	246.8	4	2	16	BT
	-063×74EC-BT50-SP12-04	○	○	63	74	135	236.8	4	2	14	BT
	-063×104EC-BT50-SP12-04	○	○	63	104	165	266.8	4	2	20	BT
	-063×134EC-BT50-SP12-04	○	○	63	134	195	296.8	4	2	26	BT
	-080×104EC-BT50-SP12-04	○	○	80	104	165	266.8	4	2	20	BT
	-080×144EC-BT50-SP12-04	○	○	80	144	205	306.8	4	2	28	BT

Spare parts · Ersatzteile

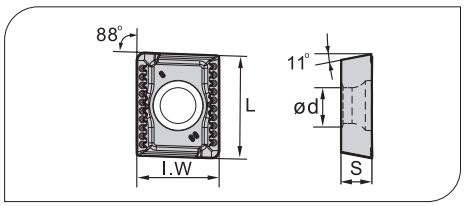
Diameter Durchmesser Ø D	Insert Screw WSP Schraube	Screw of head Schraube für Kopf	Wrench of insert Screw Schlüssel f. WSP	Wrench of head Schlüssel für Kopf	Interchangeable head Austauschbarer Kopf
					
Ø50	I60M5×13	M10×50	WT20IS	WH80L	050EC
Ø63	I60M5×13	M10×50	WT20IS	WH80L	063EC
Ø80	I60M5×13	M12×55	WT20IS	WH100L	080EC

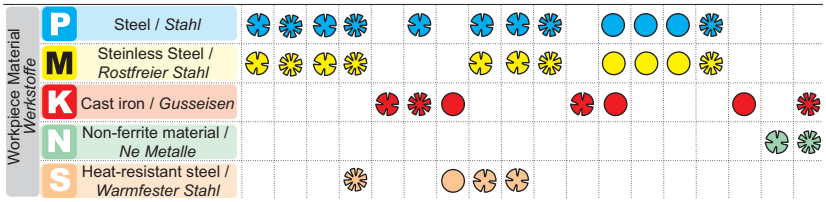


● Ex Stock / ab Lager ○ On demand / auf Anfrage

Applicable inserts · Wendeschneidplatten

Ideal Machining Condition
Gute Bearbeitungsbedingungen
Normal Machining Condition
Normale Bearbeitungsbedingungen
Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen

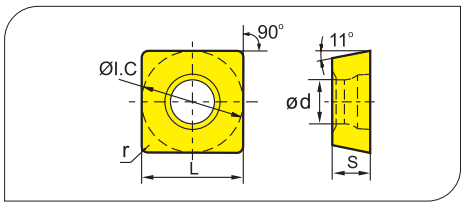


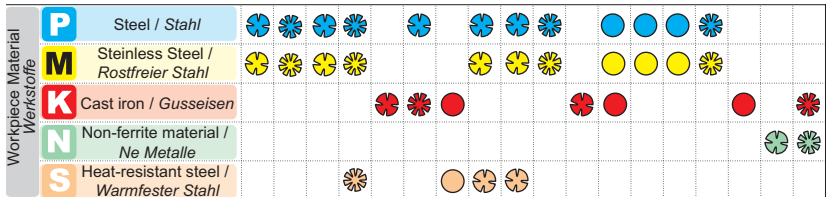


Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	I.W	S	d	r	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**APKT150412-PM**	16.33	12.7	4.76	5.4	1.2										●	○							
	APKT150412-KM	16.33	12.7	4.76	5.4	1.2										○	●							

Applicable inserts · Wendeschneidplatten

Ideal Machining Condition
Gute Bearbeitungsbedingungen
Normal Machining Condition
Normale Bearbeitungsbedingungen
Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen

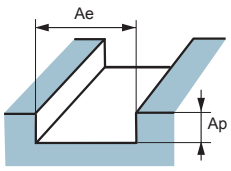




Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	I.C	S	d	r	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**SPMT120408-PM**	12.7	12.7	4.76	5.5	0.8										●	○							
	SPMT120408-KM	12.7	12.7	4.76	5.5	0.8										○	●							

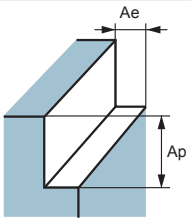
Applicable tool B9-B15
Werkzeug
Tools code key B24-B25
Werkzeug ISO
Grade selection guide B17-23
Sortenauswahl
Technical data B182-B188
Technische Daten

A Slot milling
Nutenfräsen



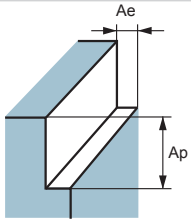
Ae=D
Ap=0.5D (cast iron/Guss)
Maximum 12mm (steel/Stahl)

B Square shoulder milling
breites Eckfräsen



Ae=0.5D
Ap=1.5D (cast iron/Guss)
1.0D (steel/Stahl)

C Narrow shoulder milling
schmales Eckfräsen



Ae=0.1D
Ap≤Maximum cutting length

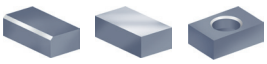
Recommended Cutting data · Schnittdaten

Workpiece material Werkstück-stoff		Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten		Operation (figure/Abb.)
				Cutting speed Schnittgeschw. (m/min)	Feed speed Vorschub (mm/z)	
P	Low-carbon steel Soft steel niedrig legierter Kohlenstoffstahl Baustahl	≤180	YBG302	80(60-90)	0.25(0.1-0.35)	A
				90(70-120)	0.3(0.15-0.4)	B
				90(70-120)	0.3(0.15-0.4)	C
	High-carbon steel hoch legierter Kohlenstoffstahl Alloy steel Leg. Stahl	180-280	YBG302	70(60-100)	0.2(0.1-0.35)	A
				80(60-120)	0.25(0.15-0.35)	B
				90(70-120)	0.25(0.15-0.35)	C
	Alloy tool steel Leg. Werkzeugstahl	280-350	YBG302	50(40-80)	0.15(0.08-0.25)	A
				60(50-100)	0.2(0.1-0.35)	B
				70(50-100)	0.2(0.1-0.35)	C
K	cast Iron Gusseisen	180-250	YBG152 YBG302	70(50-100)	0.2(0.1-0.35)	A
				80(60-120)	0.25(0.15-0.35)	B
				90(80-120)	0.25(0.15-0.35)	C

● Ex Stock / ab Lager ○ On demand / auf Anfrage

Chamfer milling tools · Fasfräser

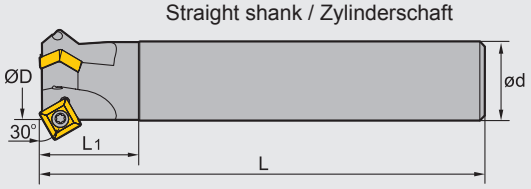
Kr:30°



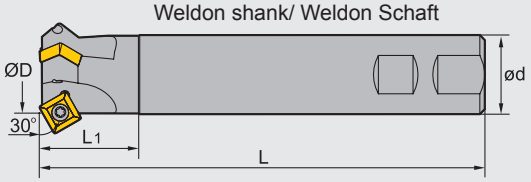
CMZ01 P M K



Straight shank / Zylinderschaft



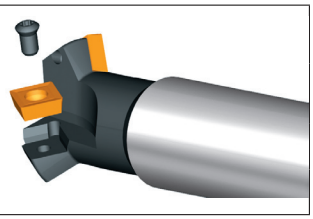
Weldon shank/ Weldon Schaft



Specification of tools · Werkzeug Beschreibung

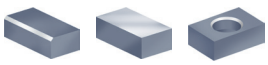
Type · Typ		Stock Lager	Dimensions (mm) · Abmessungen				No. of teeth Zähne	Weight Gewicht (kg)
			Ø D	ø d	L	L_1		
CMZ01 Straight shank Zylinder-schaft	**-012-G20-SP12-01**	○	12	20	180	40	1	0.2
	-025-G25-SP12-02	○	25	25	180	40	2	0.8
	-032-G32-SP12-03	○	32	32	180	40	3	1.1
Weldon shank Weldon Schaft	**-012-XP20-SP12-01**	○	12	20	100	40	1	0.2
	-025-XP25-SP12-02	○	25	25	100	40	2	0.6
	-032-XP32-SP12-03	○	32	32	100	40	3	1.0

Spare parts · Ersatzteile

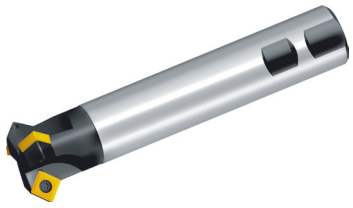
Diameter Durchmesser Ø D	Screw Schraube	Wrench Schlüssel	
			
Ø12-Ø32	I43M5×11	WT20IS	

Chamfer milling tools · Fasfräser

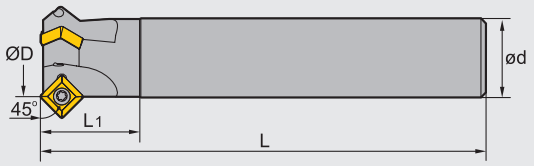
Kr:45°



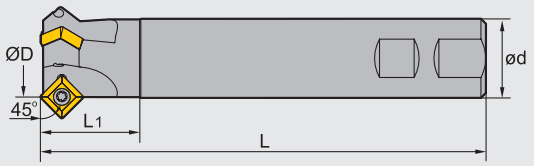
CMA01 P M K



Straight shank / Zylinderschaft



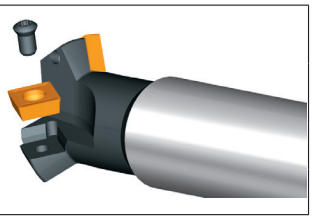
Weldon shank/ Weldon Schaft



Specification of tools · Werkzeug Beschreibung

Type · Typ		Stock Lager	Dimensions (mm) · Abmessungen				No. of teeth Zähne	Weight Gewicht (kg)
			Ø D	ø d	L	L_1		
CMA01 Straight shank	**-012-G20-SP12-01**	●	12	20	180	40	1	0.2
	-025-G25-SP12-02	●	25	25	180	40	2	0.8
Zylinder Schaft	**-032-G32-SP12-03**	●	32	32	180	40	3	1.1
Weldon shank	**-012-XP20-SP12-01**	●	12	20	100	40	1	0.2
	-025-XP25-SP12-02	●	25	25	100	40	2	0.6
Weldon Schaft	**-032-XP32-SP12-03**	●	32	32	100	40	3	1.0

Spare parts · Ersatzteile

Diameter Durchmesser Ø D	Screw Schraube	Wrench Schlüssel	
			
Ø12-Ø32	I43M5×11	WT20IS	

● Ex Stock / ab Lager ○ On demand / auf Anfrage

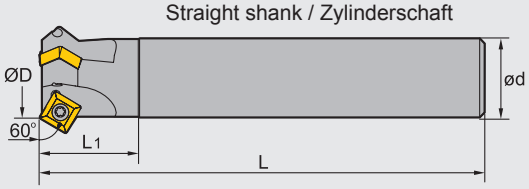
Chamfer milling tools · Fasfräser

Kr:60°

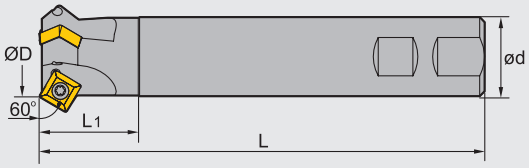
CMD01 P M K



Straight shank / Zylinderschaft



Weldon shank/ Weldon Schaft



Specification of tools · Werkzeug Beschreibung

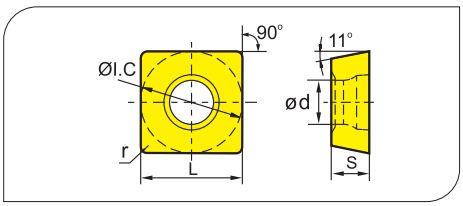
Type · Typ		Stock Lager	Dimensions (mm) · Abmessungen				No. of teeth Zähne	Weight Gewicht (kg)
			Ø D	ø d	L	L1		
CMD01 Straight shank / Zylinder Schaft	**-012-G20-SP12-01**	●	12	20	180	40	1	0.2
	-025-G25-SP12-02	●	25	25	180	40	2	0.8
	-036-G32-SP12-03	●	36	32	180	40	3	1.0
Weldon shank / Weldon Schaft	**-012-XP20-SP12-01**	●	12	20	100	40	1	0.2
	-025-XP25-SP12-02	●	25	25	100	40	2	0.6
	-036-XP32-SP12-03	●	36	32	100	40	3	1.0

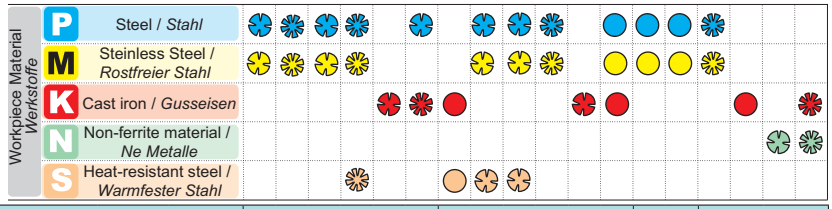
Spare parts · Ersatzteile · Ersatzteile

Diameter Durchmesser Ø D	Screw Schraube	Wrench Schlüssel	
			
Ø12-Ø32	I43M5×11	WT20IS	

Applicable inserts · Wendeschneidplatten

Ideal Machining Condition
Gute Bearbeitungsbedingungen
Normal Machining Condition
Normale Bearbeitungsbedingungen
Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen





Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		I.C	L	r	S	d	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**SPMT120408**	12.7	12.7	0.8	4.76	5.5	●	●	●															

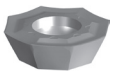
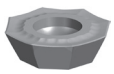
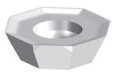
Recommended Cutting data · Schnittdaten

Workpiece material Werkstück-stoff		Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten	
				Cutting speed Schnittgeschw. (m/min)	Feed speed Vorschub (mm/z)
P	Low-carbon steel Soft steel niedrig legierter Kohlenstoffstahl Baustahl	≤180	YBM251 YBC301	180(100—250)	0.25 (0.1-0.4)
			YBM351 YBG302	150(100—200)	0.3 (0.1-0.5)
			YC30S	120(80—150)	0.4 (0.1-0.5)
	High-carbon steel hoch legierter Kohlenstoffstahl Alloy steel Leg. Stahl	180—280	YBM251 YBC301	160(100—220)	0.3 (0.1-0.4)
			YBM351 YBG302	130(100—180)	0.3 (0.1-0.5)
			YC30S	100(60—150)	0.4 (0.1-0.5)
	Alloy tool steel Leg. Werkzeugstahl	280—350	YBM251 YBC301	120(80—180)	0.3 (0.1-0.4)
			YBM351 YBG302	100(80—150)	0.3 (0.1-0.5)
			YC30S	80(60—120)	0.4 (0.1-0.5)
M	Stainless steel Rostfreier Stahl	≤270	YBM251 YBC301	120(80—180)	0.3 (0.1-0.4)
			YBM351 YBG302	100(80—150)	0.3 (0.1-0.5)
			YC30S	80(60—120)	0.4 (0.1-0.5)
K	Cast iron Gusseisen	180-250	YBG302	130(100—180)	0.4 (0.1-0.5)

● Ex Stock / ab Lager ○ On demand / auf Anfrage

Inserts - face milling · WSP - Planfräsen

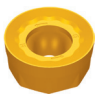
								
	SEET-CF	SEET-CM	SEET-CR	SEET-DF	SEET-DM	SEET-DR	SEET-EF	SEET-EM
Page Seite	B164	B164	B164	B164	B164	B164	B164	B164

								
	SEET-LH	SEET-W	SEK(E)N	SEKR	OFKT-DF	OFKT-DM	OFKT-LH	OFKR-DF
Page Seite	B164	B164	B166	B166	B160	B160	B160	B161

								
	OFKR-DM	SNKN	HNEX-DF	HNEX-DM	HNEX-DR	PNEG	LNKT-ZR	LNE32.534
Page Seite	B161	B173	B157	B157	B157	B158	B158	B158

							
	LNCX	SPKW	SPKT	SPAN/SPCN	SP*N	SPKR-GM	SPEX
Page Seite	B159	B169	B169	B167	B167/168	B170	B170

						
	SPMR	SP*N	TPAN/TPCN/TPKN	TPGN	TPUN	TPMR
Page Seite	B171	B172	B174	B176	B177	B177

					
	SEET*PER-PF	SEET*PER-PM	SEET*PER-PR	SEET-LH	RCKT-DM
Page Seite	B165	B165	B165	B165	B161

Inserts - square shoulder milling · WSP - Eckfräsen

								
	RCKT-DR	RDKW	APKT-PF	APKT-PM	APKT-PR	APKT-LH	APMT-PDR	APMT-PDER
Page Seite	B161	B162	B155	B155	B155	B155	B156	B156

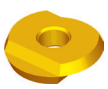
Inserts - square shoulder milling · WSP - Eckfräsen

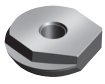
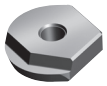



	APET16Q5	APET1604
Page / Seite	B156	B156

Inserts for profile milling · WSP - Formfräsen



	ZDET	ZPNT	SPMT/SDMT	ROHX	XPHT-GM	ZOHX-GF	ZOHX-GM
Page / Seite	B180	B181	B169	B162	B179	B181	B181

Inserts - side and face milling WSP - Seiten und Stirnfräsen




	XSEQ	MPHT
Page / Seite	B180	B160

Inserts - high feed milling WSP - Hochvorschubfräsen




	SDMT-DM	WPGT
Page / Seite	B163	B179

Inserts - T-slot milling WSP - T-Nuten Fräsen



	MPHT
Page / Seite	B160

Inserts - helical milling WSP - Zirkular Fräsen






	APKT-PM/KM	SPMT-PM/KM	XEEN	XEEQ
Page / Seite	B157	B169	B178	B178

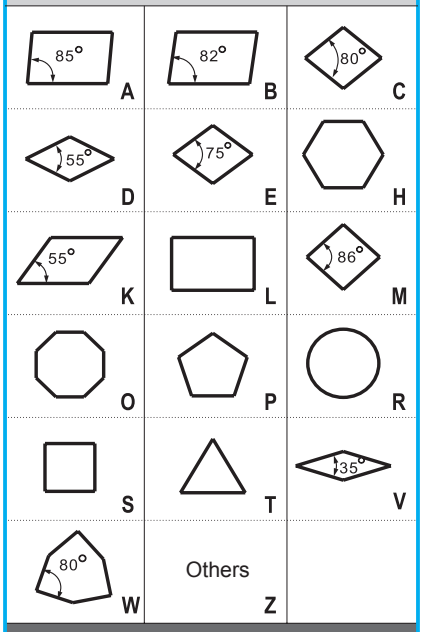
Inserts - chamfer milling WSP - Fasfräsen



	SPMT
Page / Seite	B169

Indexable milling inserts code key · Wendeplattenfräser ISO Kode

Insert Code · WSP Code



Insert · WSP

Metric System · Metrisches System

Code	hole Loch	chipbreaker Spanbrecher	Section Form	Code	hole Loch	chipbreaker Spanbrecher	Section Form
B	✔	-	>65°	N	-	-	
H	✔	Single-side	>65°	R	-	Single-side	
C	✔	-	>65°	F	-	Double-side	
J	✔	Double-side	>65°	A	✔	-	
W	✔	-	≤65°	M	✔	Single-side	
T	✔	Single-side	≤65°	G	✔	Double-side	
Q	✔	-	≤65°	X	---	---	Special
U	✔	Double-side	≤65°				

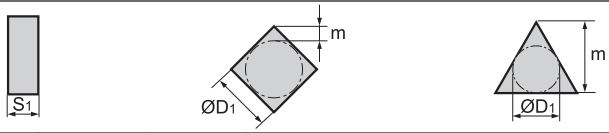
Chipbreaker and clamping system

S P K N

Clearance angle of main cutting edge

Code	Clearance angle	Code	Clearance angle
A	3°	B	5°
C	7°	D	15°
E	20°	F	25°
G	30°	N	0°
P	11°	O	Other clearance angle

Tolerance



Code	Nose height M Tolerance(mm)	Inscribed circle ØD1 Tolerance(mm)	Thickness S Tolerance(mm)
A	±0.005	±0.025	±0.025
F	±0.005	±0.013	±0.025
C	±0.013	±0.025	±0.025
H	±0.013	±0.013	±0.025
E	±0.025	±0.025	±0.025
G	±0.025	±0.025	±0.13
J	±0.005	±0.05-±0.13	±0.025
K	±0.013	±0.05-±0.13	±0.025
L	±0.025	±0.05-±0.13	±0.025
M	±0.08-±0.18	±0.05-±0.13	±0.13
N	±0.08-±0.18	±0.05-±0.13	±0.025
U	±0.13-±0.38	±0.08-±0.25	±0.13

(Reference) details of M-class tolerance (identified by shape and size)

● Nose height tolerance(mm)

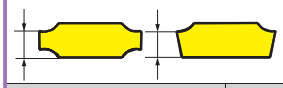
Inscribed circle	Regular triangle	Square	Diamond with 80°	Diamond with 55°	Diamond with 35°	Round
6.35	±0.08	±0.08	±0.08	±0.11	±0.16	---
9.525	±0.08	±0.08	±0.08	±0.11	±0.16	---
12.7	±0.13	±0.13	±0.13	±0.15	---	---
15.875	±0.15	±0.15	±0.15	±0.18	---	---
19.05	±0.15	±0.15	±0.15	±0.18	---	---
25.4	---	±0.18	---	---	---	---

● Tolerance of Inscribed Circle ØD1(mm)

Inscribed circle	Regular triangle	Square	Diamond with 80°	Diamond with 55°	Diamond with 35°	Round
6.35	±0.05	±0.05	±0.05	±0.05	±0.05	---
9.525	±0.05	±0.05	±0.05	±0.05	±0.05	±0.05
12.7	±0.08	±0.08	±0.08	±0.08	---	±0.08
15.875	±0.10	±0.10	±0.10	±0.10	---	±0.10
19.05	±0.10	±0.10	±0.10	±0.10	---	±0.10
25.4	---	±0.13	---	---	---	±0.13

Diameter of IC	Insert/ WSP						
	C	D	R	S	T	V	W
3.97					06		
5.0			05				
5.56					09		
6.0			06				
6.35	06	07			11	11	
8.0			08				
9.525	09	11	09	09	16	16	06
10.0			10				
12.0			12				
12.7	12	15	12	12	22	22	08
15.875	16		15	15	27		
16.0		19	16				
19.05	19		19	19	33		
20.0			20				
25.0	25	25	25				
25.4			25	25			
31.75			31				
32			32				

Length of cutting edge · Schneidkantenlänge



Definition thickness
Definition dicke

Code	Insert thickness (mm)
00	0.79
T0	0.99
01	1.59
T1	1.98
02	2.38
T2	2.58
03	3.18
T3	3.97
04	4.76
T4	4.96
05	5.96
T5	5.95
06	6.35
T6	6.75
07	7.94
09	9.52
T9	9.72
11	11.11
12	12.70

Insert thickness · WSP dicke

12 04 ED T21K R -DM

Angel · Winkel

Kr		αn	
A	45°	A	3°
D	60°	B	5°
E	75°	C	7°
F	85°	D	15°
P	90°	E	20°
Z	Others	F	25°
		G	30°
		N	0°
		P	11°
		Z	Others Andere

Chamfer · Fase (mm)

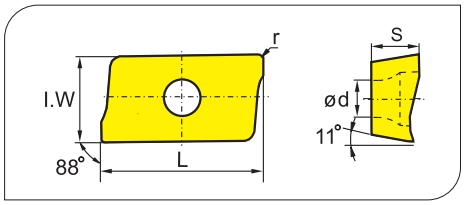
F	0-5°	0-0.10	K
	1-10°	1-0.15	
E	2-15°	2-0.20	P
	3-20°	3-0.25	
T	4-25°	4-0.30	W
	5-30°	5-0.35	
		6-0.40	
S		7-0.45	No mark

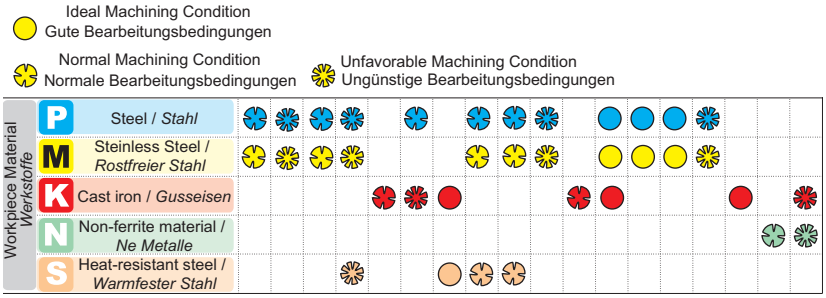
Chipbreaker code Spanbrecher

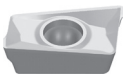
Cutting direction Schnittrichtung

R	Right hand
L	Left hand
N	Neutral

AP**

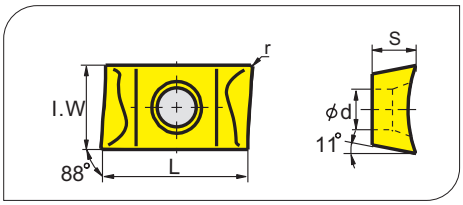




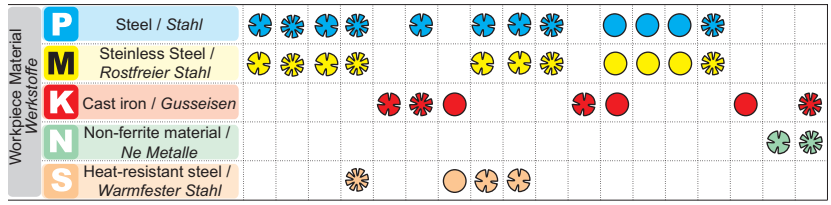
Insert shape Plattenform	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	I.W	S	d	r	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**APKT11T304-PF**	12.24	6.5	3.6	2.8	0.4	○		●	●				●		●								
	APKT11T308-PF	12.24	6.5	3.6	2.8	0.8			●					●										
	APKT11T312-PF	12.24	6.5	3.6	2.8	1.2								○										
	APKT11T316-PF	12.24	6.5	3.6	2.8	1.6								●										
	APKT160408-PF	17.877	9.33	5.76	4.4	0.8	●		●	●				●		●								
	**APKT11T304-PM**	12.24	6.5	3.6	2.8	0.4	●	●	●	●			●	●		●								
	APKT11T308-PM	12.24	6.5	3.6	2.8	0.8	●		●	●	●		●	●		●								
	APKT11T312-PM	12.24	6.5	3.6	2.8	1.2			●					●										
	APKT11T316-PM	12.24	6.5	3.6	2.8	1.6			●					●										
	APKT160408-PM	17.877	9.33	5.76	4.4	0.8	●	●	●	●	●	●	●	●	●	●								
	**APKT11T304-PR**	12.24	6.5	3.6	2.8	0.4		●		●						●								
	**APKT11T304-LH**	12.24	6.5	3.6	2.8	0.4																	●	●
	APKT11T308-LH	12.24	6.5	3.6	2.8	0.8																	●	●
	APKT160408-LH	17.877	9.33	5.76	4.4	0.8																	●	●

Applicable tool B9-B15
Werkzeug
Inserts code key B153-B154
WSP ISO
Grade selection guide B17-23
Sortenauswahl
Technical data B182-B188
Technische Daten

APET**

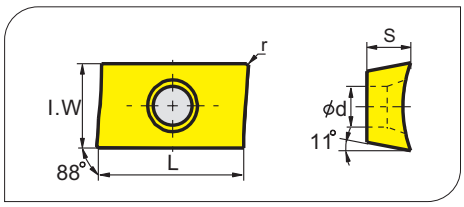


Ideal Machining Condition
Gute Bearbeitungsbedingungen
Normal Machining Condition
Normale Bearbeitungsbedingungen
Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen

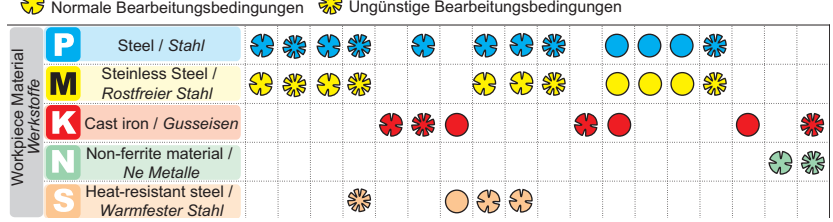


Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	I.W	S	d	r	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**APET16Q508ER**	9.525	16.9	5.28	4.4	0.8																		

APET**

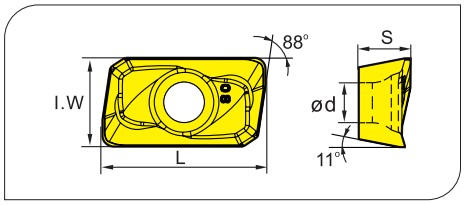


Ideal Machining Condition
Gute Bearbeitungsbedingungen
Normal Machining Condition
Normale Bearbeitungsbedingungen
Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen

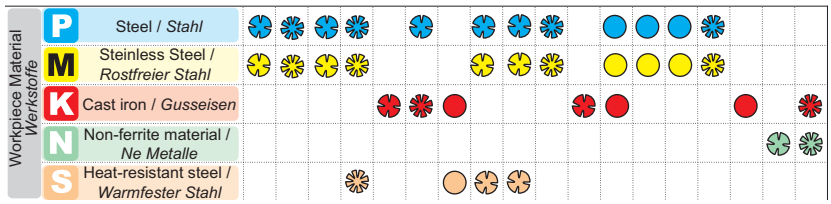


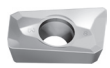
Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	I.W	S	d	r	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**APET1604PDR**	9.525	16.9	4.76	4.5	0.86																		

AP**



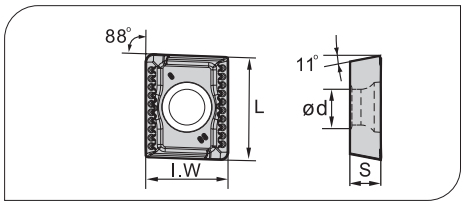
Ideal Machining Condition
Gute Bearbeitungsbedingungen
Normal Machining Condition
Normale Bearbeitungsbedingungen
Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen



Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	I.W	S	d	r	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**APMT1135PDR**	11.25	6.2	3.5	2.8	0.8			●				○	○	●									
	**APMT160408PDER**	17.25	9.25	4.76	4.4	0.8							○		●									
	APMT160432PDER	17.25	9.25	4.76	4.4	3.2				○				●										

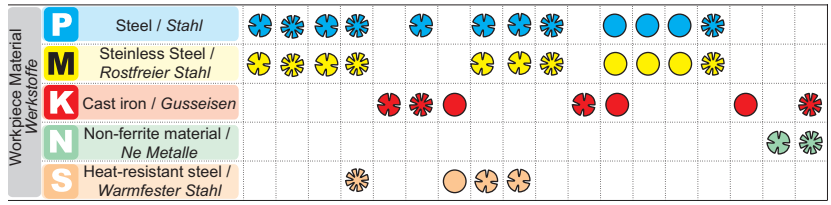
● Ex Stock / ab Lager ○ On demand / auf Anfrage

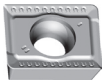
AP**



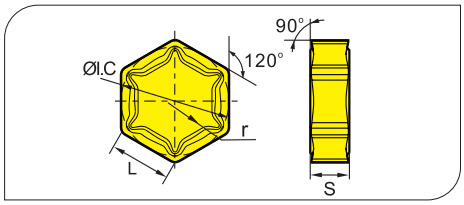
Ideal Machining Condition
Gute Bearbeitungsbedingungen
Normal Machining Condition
Normale Bearbeitungsbedingungen
Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen

Workpiece Material / Werkstoffe



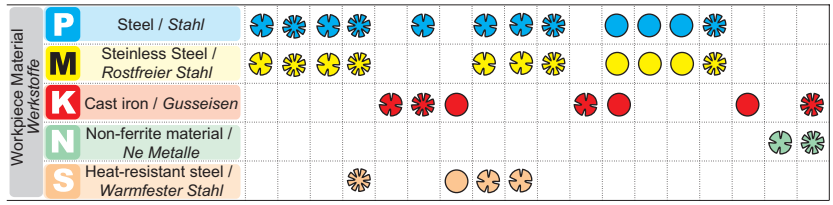
Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	I.W	S	d	r	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**APKT150412-PM**	16.33	12.7	4.76	5.4	1.2										●	○							
	APKT150412-KM	16.33	12.7	4.76	5.4	1.2										○	●							

HN**



Ideal Machining Condition
Gute Bearbeitungsbedingungen
Normal Machining Condition
Normale Bearbeitungsbedingungen
Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen

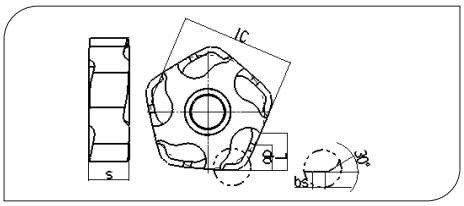
Workpiece Material / Werkstoffe



Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen				CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	I.C	S	R	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**HNEX090512-DF**	9.26	15.875	5.56	1.2																		
	**HNEX090512-DM**	9.26	15.875	5.56	1.2																		
	**HNEX090512-DR**	9.26	15.875	5.56	1.2					●	●												

Applicable tool B9-B15
Werkzeug
Inserts code key B153-B154
WSP ISO
Grade selection guide B17-23
Sortenauswahl
Technical data B182-B188
Technische Daten

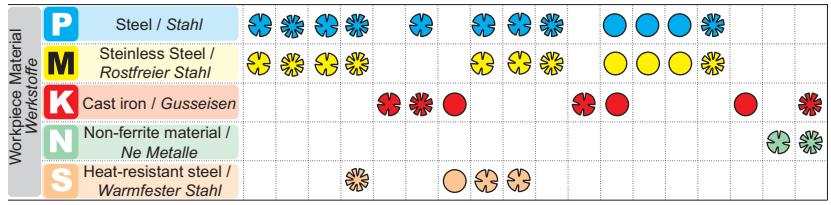
PN**



Ideal Machining Condition
Gute Bearbeitungsbedingungen

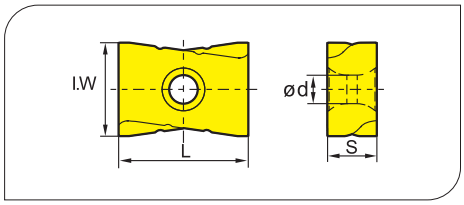
Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen



Insert shape Plattenform	Type · Typ	Dimension (mm) Abmessung					CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	l.C	S	bs	ap	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**PNEG110512R-CR**	5	15.875	5.56	1.6	3.5					●	●												
	PNEG110512R-CF	5	15.875	5.56	1.6	3.5					○	○												

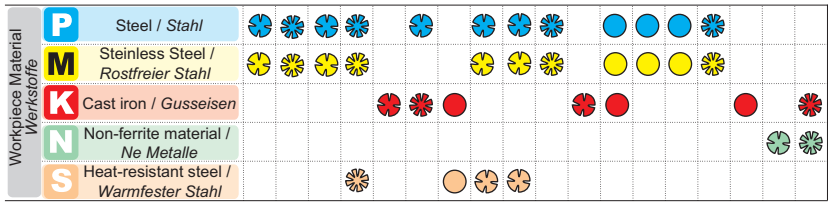
LN**



Ideal Machining Condition
Gute Bearbeitungsbedingungen

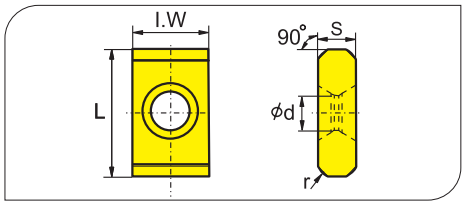
Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen



Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen				CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	l.W	S	d	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**LNKT1506EN-ZR**	15.875	14	6.35	4.6	●		●	●	●	●				●								
	LNKT2007DN-ZR	20	17	7.94	4.6				●		●				●								
	LNKT2510-ZR	25	18	9.525	5.5				●		●				●								

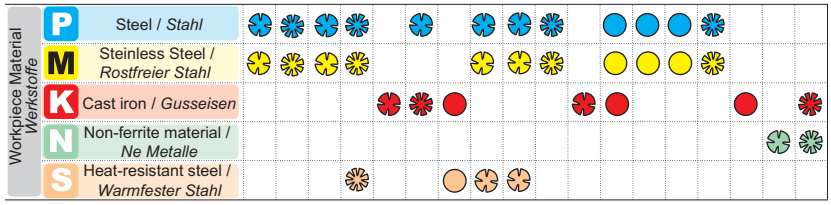
LN**



Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

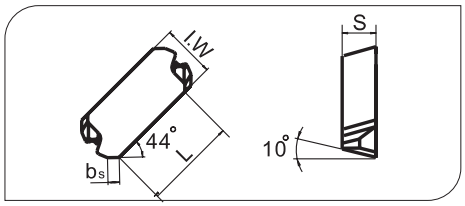
Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen



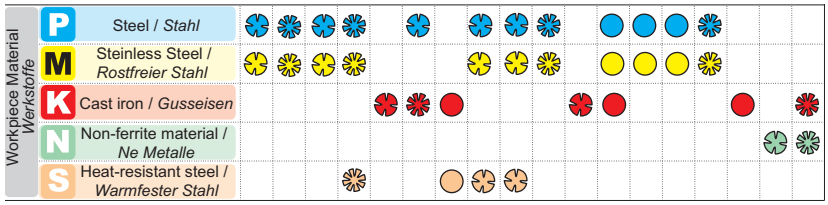
Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	l.W	S	d	r	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**LNE32.534**	15.875	9.525	4.76	4.4	1.6				○	○													
	LNE32.302	15.875	9.525	4.76	4.2	45 Fase			○			○												

● Ex Stock / ab Lager ○ On demand / auf Anfrage

LNCX

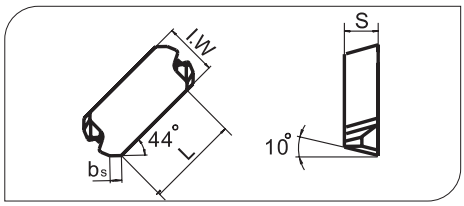


Ideal Machining Condition
Gute Bearbeitungsbedingungen
Normal Machining Condition
Normale Bearbeitungsbedingungen
Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen

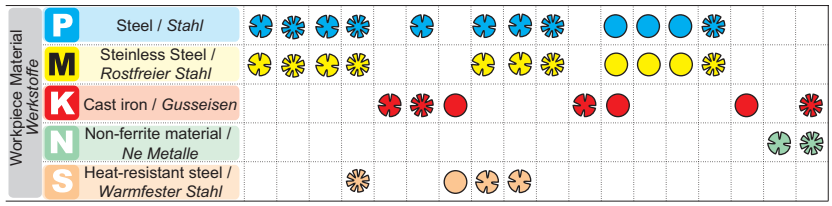


Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	I.W	S	bs		YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**LNCX1806AZR**	18.77	10.0	6.4	2.0		●							○										○
	LNCX1806AZL	18.77	10.0	6.4	2.0																			

LNCX



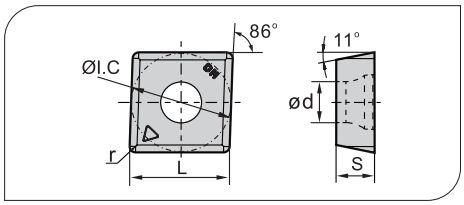
Ideal Machining Condition
Gute Bearbeitungsbedingungen
Normal Machining Condition
Normale Bearbeitungsbedingungen
Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen



Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	I.W	S	bs	T-land	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**LNCX1806AZT11R**	18.77	10.0	6.4	2.0	0.1						○												
	LNCX1806AZT11L	18.77	10.0	6.4	2.0	0.1						○												

Applicable tool B9-B15
Werkzeug
Inserts code key B153-B154
WSP ISO
Grade selection guide B17-23
Sortenauswahl
Technical data B182-B188
Technische Daten

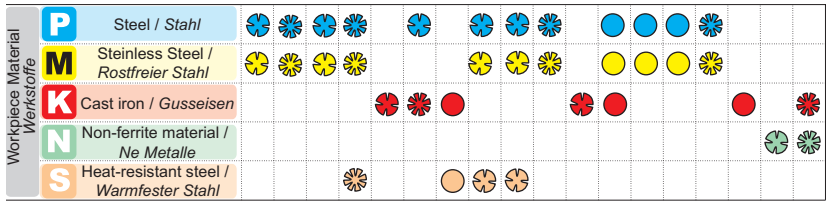
MP**



Ideal Machining Condition
Gute Bearbeitungsbedingungen

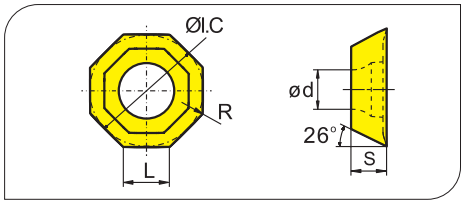
Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen



Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		I.C	L	S	d	r	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**MPHT060304-DM**	6.35	6.35	3.18	2.8	0.4			●							●								
	MPHT080305-DM	8.3	8.3	3.18	3.4	0.5			●							○								
	MPHT120408-DM	12.7	12.7	4.76	5.56	0.8			●							●								

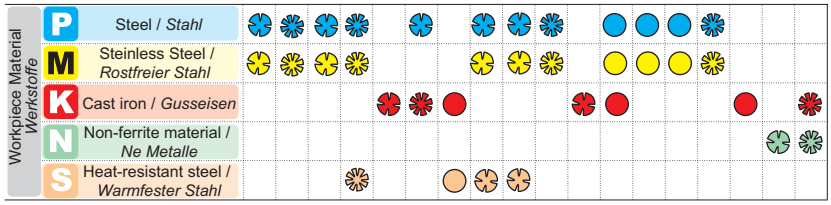
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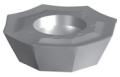
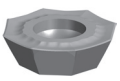
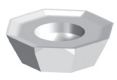


Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

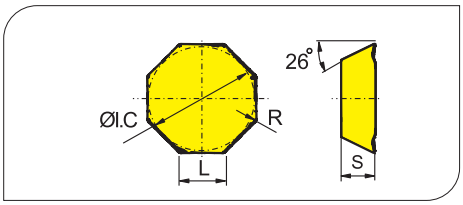
Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen



Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	I.C	S	d	R	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**OFKT05T3-DF**	5.26	12.7	3.97	4.4	0.5			●	○			●	●		○								
	**OFKT05T3-DM**	5.26	12.7	3.97	4.4	0.5			○				●	●		●								
	**OFKT05T3-LH**	5.26	12.7	3.97	4.4	0.5																	●	

● Ex Stock / ab Lager ○ On demand / auf Anfrage

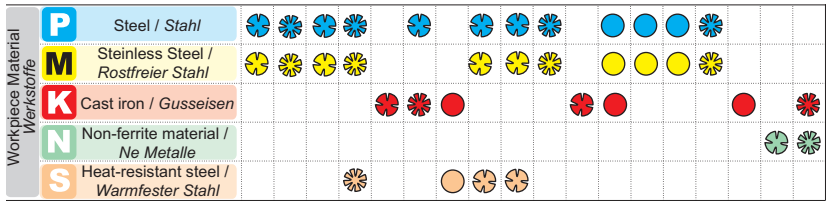
OF**



Ideal Machining Condition
Gute Bearbeitungsbedingungen

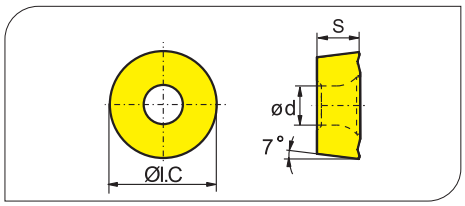
Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen



Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen				CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	I.C	S	R	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**OFKR0704-DF**	7.45	17.94	4.76	0.8			●					●										
	**OFKR0704-DM**	7.45	17.94	4.76	0.8	●	●	●	●	●	●	●	●										
	OFKR0704W-DM	7.45	17.94	4.76		●					●			●									

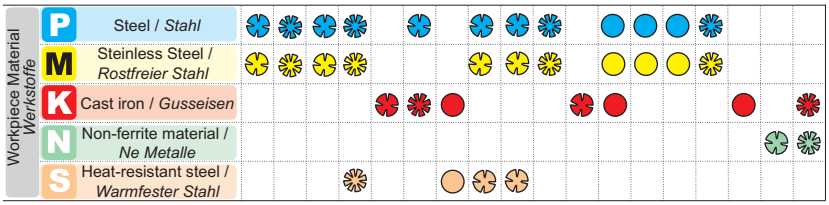
RC□□

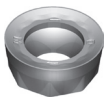


Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen



Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen				CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		R	I.C	S	d	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**RCKT10T3MO-DM**	5	10.0	3.97	4.4	●	●								○								
	RCKT1204MO-DM	6	12.0	4.76	4.0	●	●	●	●	○			○										
	RCKT1204MO-DR	6	12.0	4.76	4.0	●	●	●	●														
	RCKT1606MO-DM	8	16	6.35	5.56	●	●	○							○								
	RCKT1606MO-DR	8	16	6.35	5.56	●	●		●		●												
	RCKT2006MO-DM	8	16	6.35	5.56	●	●																
	RCKT2006MO-DR	10	20	6.35	6.55	●	●		●		●												

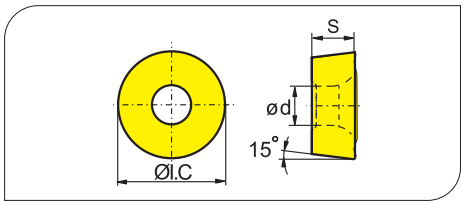
Applicable tool B9-B15
Werkzeug

Inserts code key B153-B154
WSP ISO

Grade selection guide B17-23
Sortenauswahl

Technical data B182-B188
Technische Daten

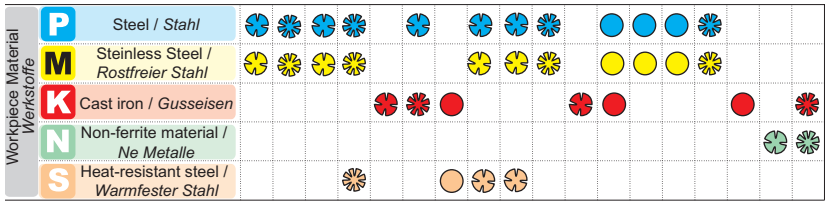
RD**



Ideal Machining Condition
Gute Bearbeitungsbedingungen

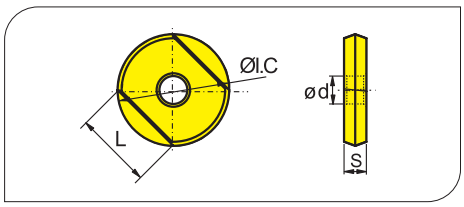
Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen



Insert shape Plattenform	Type · Typ	Dimension (mm) Abmessung				CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		R	I.C	S	d	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**RDKW0702MO**	3.5	7.0	2.38	2.7				●			●	●										
	RDKW0803MO	4	8.0	3.18	3.4				●				●										
	RDKW1003MO	5	10.0	3.18	3.9			●	●			●	●										
	RDKW10T3MO	5	10.0	3.97	4.4	○			●			●	●										
	RDKW1204MO	6	12.0	4.76	4.4			○	●			●	●										
	RDKW12T3MO	6	12.0	3.97	3.9		○	●	●			●	●									○	
	RDKW1604MO	8	16.0	4.76	5.2				●			●	●										
	RDKW1605MO	8	16.0	5.56	5.5				●				●		○								
	RDKW2006MO	10	20.0	6.35	6.5				●		○												

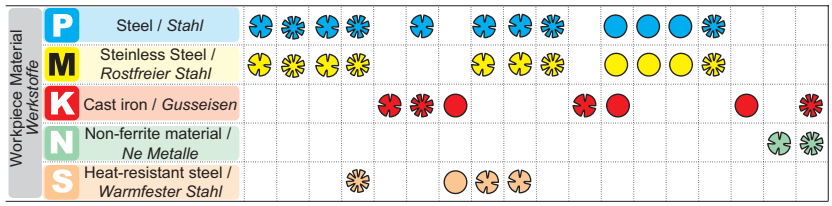
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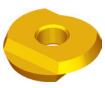


Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

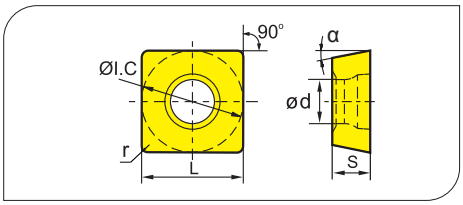
Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen



Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen				CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		I.C	L	S	d	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**ROHX1203**	12	8.5	3	4				●			○	●										
	ROHX1604	16	11.3	4	5				●				●										
	ROHX2005	20	14.1	5	5				●				●										

● Ex Stock / ab Lager ○ On demand / auf Anfrage

SD**



Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

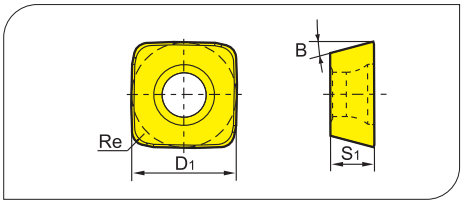
Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen

Workpiece Material / Werkstoffe

P	Steel / *Stahl*
M	Steinless Steel / *Rostfreier Stahl*
K	Cast iron / *Gusseisen*
N	Non-ferrite material / *Ne Metalle*
S	Heat-resistant steel / *Warmfester Stahl*

Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen						CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		r	L	I.C	S	d	α	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**SDMT090308**	0.8	9.525	9.525	3.18	4.4	15°			●															

SD**



Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen

Workpiece Material / Werkstoffe

P	Steel / *Stahl*
M	Steinless Steel / *Rostfreier Stahl*
K	Cast iron / *Gusseisen*
N	Non-ferrite material / *Ne Metalle*
S	Heat-resistant steel / *Warmfester Stahl*

Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen				CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		B	Re	S_1	D_1	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**SDMT09T312-DM**	15°	1.2	3.97	9.525				●		●		●		●								
	SDMT120412-DM	15°	2.0	4.76	12.7				●		●		●		○								

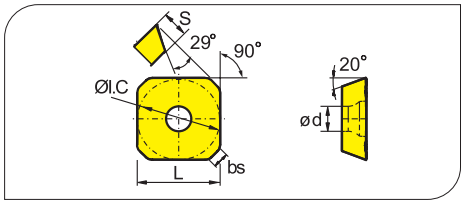
Applicable tool B9-B15
Werkzeug

Inserts code key B153-B154
WSP ISO

Grade selection guide B17-23
Sortenauswahl

Technical data B182-B188
Technische Daten

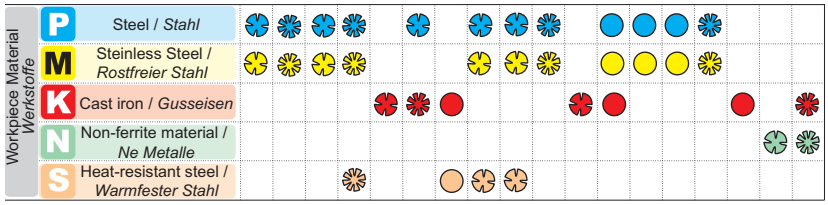
SE**



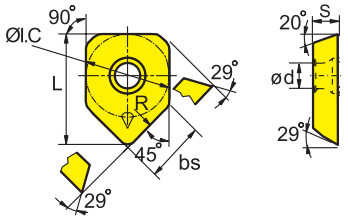
Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen

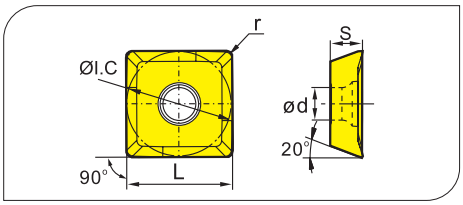


Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen						CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	I.C	S	d	bs	R	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**SEET12T3-DF**	13.40	13.40	3.97	4.1	2.55		●		●	●				●										
	SEET12T3-CF	13.40	13.40	3.97	4.1	2.55						●		●											
	SEET12T3-EF	13.40	13.40	3.97	4.1	2.55									○		●								
	**SEET12T3-DM**	13.40	13.40	3.97	4.1	2.55		●	●	●	●														
	SEET12T3-CM	13.40	13.40	3.97	4.1	2.55						●		●											
	SEET12T3-EM	13.40	13.40	3.97	4.1	2.55				●							●								
	**SEET12T3-DR**	13.40	13.40	3.97	4.1	2.55		●	●		●		●		○		○								
	SEET12T3-CR	13.40	13.40	3.97	4.1	2.55						●	○												
	**SEET12T3-LH**	13.40	13.40	3.97	4.1	2.55																		●	●
	**SEET12T3-W**	17.82	13.40	3.97	4.1	9.46	500			○		●			●		○								○



● Ex Stock / ab Lager ○ On demand / auf Anfrage

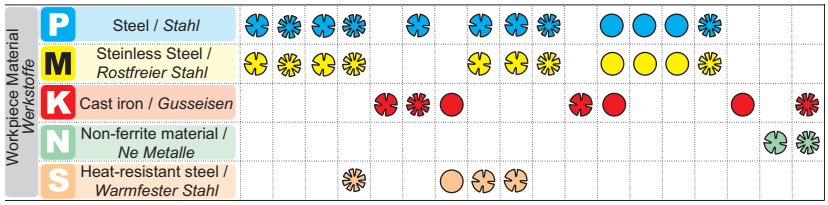
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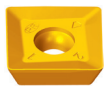


Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen



Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	I.C	S	d	r	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**SEET09T308PER-PF**	9.525	9.525	4.01	3.3	0.8								●										
	**SEET09T308PER-PM**	9.525	9.525	4.01	3.3	0.8								●										
	**SEET09T308PER-PR**	9.525	9.525	4.01	3.3	0.8					●													
	**SEET120308PER-PF**	13.308	13.308	4.04	4.1	0.8	●			●				●										
	**SEET120308PER-PM**	13.308	13.308	4.04	4.1	0.8			●	●	●	●	●	●		●								
	**SEET120308PER-PR**	13.308	13.308	4.04	4.1	0.8			●	●		●	○	○										
	**SEET120308-LH**	13.308	13.308	4.04	4.1	0.8							●										●	

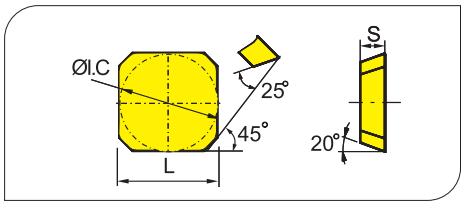
Applicable tool B9-B15
Werkzeug

Inserts code key B153-B154
WSP ISO

Grade selection guide B17-23
Sortenauswahl

Technical data B182-B188
Technische Daten

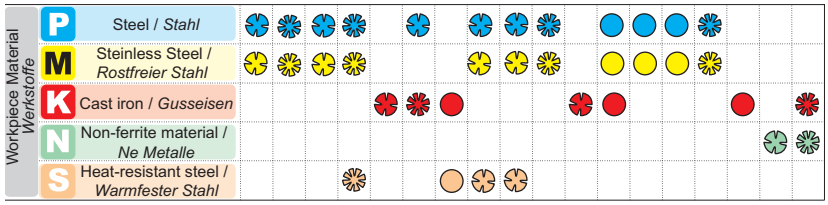
SE**



Ideal Machining Condition
Gute Bearbeitungsbedingungen

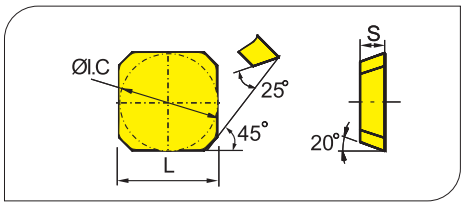
Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen



Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen			CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	I.C	S	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**SEEN1203AFTN**	12.7	12.7	3.18																		
	SEKN1203AFFN	12.7	12.7	3.18																		
	SEKN1203AFN	12.7	12.7	3.18	●														○		●	
	SEKN1203AFTN	12.7	12.7	3.18	●		●										●		●			●
	SEKN1203AFS430N	12.7	12.7	3.18	○																	
	SEKN1204AFN	12.7	12.7	4.76	●																	
	SEKN1204AFTN	12.7	12.7	4.76	●																	●
	SEKN1204AFS430N	12.7	12.7	4.76	○																	
	SEKN1504AFN	15.875	15.875	4.76	○																○	○
	SEKN1504AFTN	15.875	15.875	4.76	●	●	●												●			
	SEKN1504AFZN	15.875	15.875	4.76																		
	SEKN1204AZ	15.875	15.875	4.76	●	○																●
	SEKN1504AZ	15.875	15.875	4.76	●	●																●

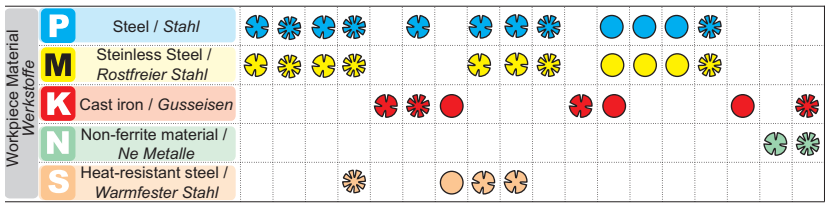
SE**



Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

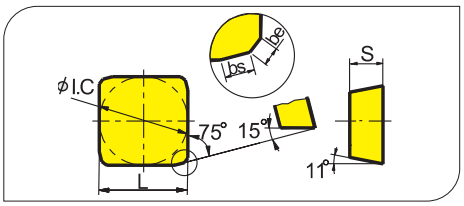
Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen



Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen			CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	I.C	S	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**SEKR1203AFN**	12.7	12.7	3.18	●	○						●										
	SEKR1504AFN	15.875	15.875	4.76																		

● Ex Stock / ab Lager ○ On demand / auf Anfrage

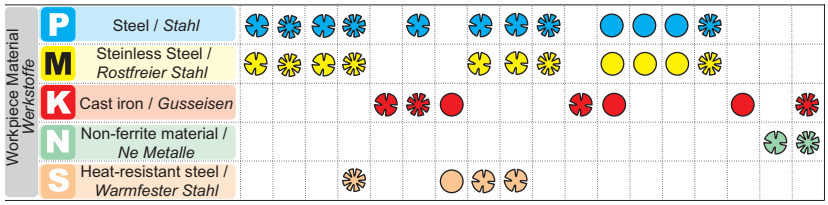
SP*N



Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen



Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	I.C	S	be	bs	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SPAN1203EDEL	12.7	12.7	1.4	1	3.18	○																	
	SPAN1203EDER	12.7	12.7	1.4	1	3.18	○																	
	SPAN1203EDFL	12.7	12.7	1.4	1	3.18																		○
	SPAN1203EDFR	12.7	12.7	1.4	1	3.18																		●
	SPAN1203EDL	12.7	12.7	1.4	1	3.18																		
	SPAN1203EDR	12.7	12.7	1.4	1	3.18																		○
	SPAN1504EDFR	15.875	15.875	1.4	1	4.76																		○
	SPAN1504EDFL	15.875	15.875	1.4	1	4.76																		○
	SPCN1203EDR	12.7	12.7	1.4	1	3.18	○														○			
	SPCN1504EDR	15.875	15.875	1.4	1	4.76	●														○			

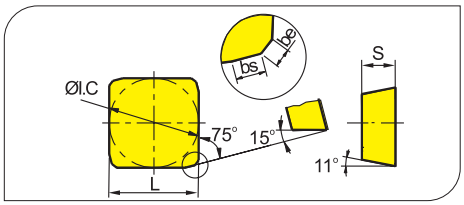
Applicable tool B9-B15
Werkzeug

Inserts code key B153-B154
WSP ISO

Grade selection guide B17-23
Sortenauswahl

Technical data B182-B188
Technische Daten

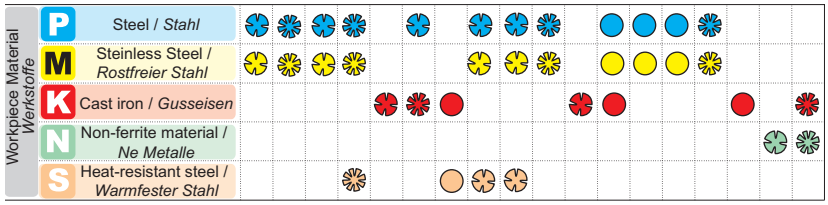
SP*N



Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

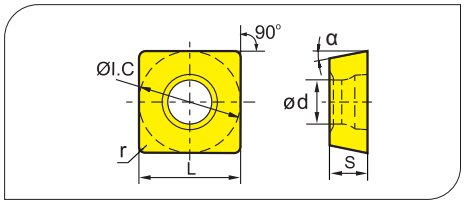
Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen



Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	I.C	S	be	bs	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SPKN1203EDER	12.7	12.7	3.18	1	1.4																		
	SPKN1203EDEL	12.7	12.7	3.18	1	1.4																		
	SPKN1203EDFR (SPKN1203EDR)	12.7	12.7	3.18	1	1.4																	○	●
	SPKN1203EDFL (SPKN1203EDL)	12.7	12.7	3.18	1	1.4																		●
	SPKN1203EDSKR (SPKN1203EDR)	12.7	12.7	3.18	1	1.4	●						●	●		●					●			
	SPKN1203EDSKL (SPKN1203EDL)	12.7	12.7	3.18	1	1.4								●							●			
	SPKN1203EDTKR (SPKN1203EDTR)	12.7	12.7	3.18	1	1.4																		
	SPKN1203EDTKL	12.7	12.7	3.18	1	1.4																		
	SPKN1203EDS31PR (SPKN1203EDT31R)	12.7	12.7	3.18	1	1.4								○										
	SPKN1203EDS31PL (SPKN1203EDT31L)	12.7	12.7	3.18	1	1.4																		
	SPKN1204EDFL (SPKN1204EDL)	12.7	12.7	4.76	1	1.4																		○
	SPKN1204EDER (SPKN1204EDR)	12.7	12.7	4.76	1	1.4	●	●													○			
	SPKN1204EDFR	12.7	12.7	4.76	1	1.4																		○
	SPKN1504EDER	15.875	15.875	4.76	1	1.4																		
	SPKN1504EDEL	15.875	15.875	4.76	1	1.4																		
	SPKN1504EDFR (SPKN1504EDR)	15.875	15.875	4.76	1	1.4																		●
	SPKN1504EDFL (SPKN1504EDL)	15.875	15.875	4.76	1	1.4																		●
	SPKN1504EDSKR (SPKN1504EDR)	15.875	15.875	4.76	1	1.4	●							●							●			
	SPKN1504EDSKL (SPKN1504EDL)	15.875	15.875	4.76	1	1.4															●			
	SPKN1504EDTKR (SPKN1504EDR)	15.875	15.875	4.76	1	1.4							●											
	SPKN1504EDTKL	15.875	15.875	4.76	1	1.4																		
	SPKN1504EDS32PR (SPKN1504EDT32R)	15.875	15.875	4.76	1	1.4								●										
	SPKN1504EDS32PL (SPKN1504EDTL)	15.875	15.875	4.76	1	1.4																		
	SPKN1504EDT32PR (SPKN1504EDTR)	15.875	15.875	4.76	1	1.4	●																	
	SPKN1504EDT32PL (SPKN1504EDTL)	15.875	15.875	4.76	1	1.4																		
	SPKN1904EDFL (SPKN1904EDL)	19.05	19.05	4.76	1	1.4																		
	SPKN1904EDFR (SPKN1904EDR)	19.05	19.05	4.76	1	1.4																		

● Ex Stock / ab Lager ○ On demand / auf Anfrage

SP**



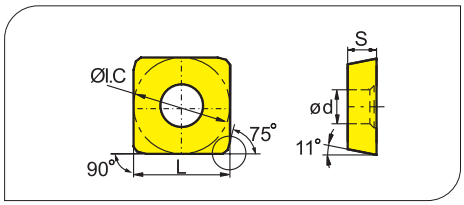
Ideal Machining Condition
Gute Bearbeitungsbedingungen
Normal Machining Condition
Normale Bearbeitungsbedingungen
Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen

Workpiece Material / Werkstoffe

P	Steel / *Stahl*
M	Steinless Steel / *Rostfreier Stahl*
K	Cast iron / *Gusseisen*
N	Non-ferrite material / *Ne Metalle*
S	Heat-resistant steel / *Warmfester Stahl*

Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen						CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		r	L	I.C	S	d	α	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**SPMT060304-KT**	0.4	6.35	6.35	3.18	2.8	11°	○																	
	SPMT060304	0.4	6.35	6.35	3.18	2.8	11°			●															
	SPMT09T308-HT	0.8	9.525	9.525	3.97	4.4	11°	●	●																
	SPMT09T308	0.8	9.525	9.525	3.97	4.4	11°	●	●																
	SPMT120408	0.8	12.7	12.70	4.76	5.5	11°	●	●	●															
	**SPMT120408-PM**	0.8	12.7	12.70	4.76	5.5	11°										●								
	SPMT120408-KM	0.8	12.7	12.70	4.76	5.5	11°											●							
	**SPKT1204EDR**	--	12.7	12.7	4.76	5.56	11°								●										

SP*W



Ideal Machining Condition
Gute Bearbeitungsbedingungen
Normal Machining Condition
Normale Bearbeitungsbedingungen
Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen

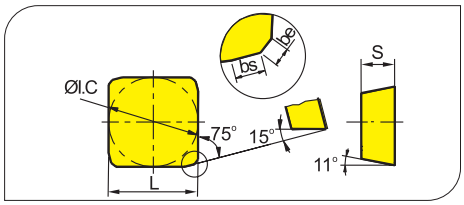
Workpiece Material / Werkstoffe

P	Steel / *Stahl*
M	Steinless Steel / *Rostfreier Stahl*
K	Cast iron / *Gusseisen*
N	Non-ferrite material / *Ne Metalle*
S	Heat-resistant steel / *Warmfester Stahl*

Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen						CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		r	L	I.C	S	d	α	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**SPKW1204EDFR**	---	12.7	12.7	4.76	5.56	11°								●										
	SPKW1204EDSR	---	12.7	12.7	4.76	5.56	11°								●										

Applicable tool B9-B15
Werkzeug
Inserts code key B153-B154
WSP ISO
Grade selection guide B17-23
Sortenauswahl
Technical data B182-B188
Technische Daten

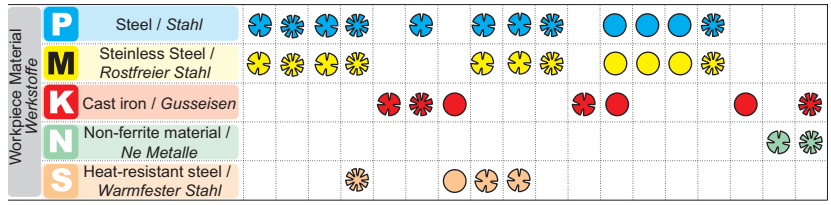
SP*R



Ideal Machining Condition
Gute Bearbeitungsbedingungen

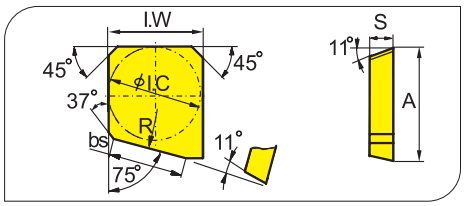
Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen



Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	I.C	S	be	bs	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**SPKR1203EDR-GM**	12.7	12.7	3.18	1	1.4			○															
	SPKR1203EDL-GM	12.7	12.7	3.18	1	1.4			○															
	SPKR1504EDR-GM	15.875	15.875	4.76	1	1.4			○															
	SPKR1504EDL-GM	15.875	15.875	4.76	1	1.4			○															

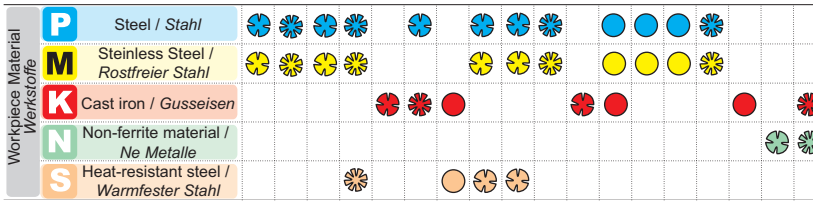
SP*X



Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

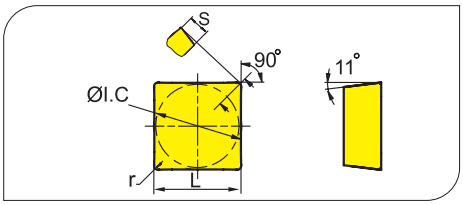
Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen



Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen						CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		A	I.C	I.W	S	bs	R	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**SPEX1203EDL-1**	15	12.7	12.7	3.18	10	500																		○
	SPEX1203EDR-1	15	12.7	12.7	3.18	10	500																		○
	SPEX1504EDL-1	18.2	15.875	15.875	4.76	10	500																		○
	SPEX1504EDR-1	18.2	15.875	15.875	4.76	10	500																		○

● Ex Stock / ab Lager ○ On demand / auf Anfrage

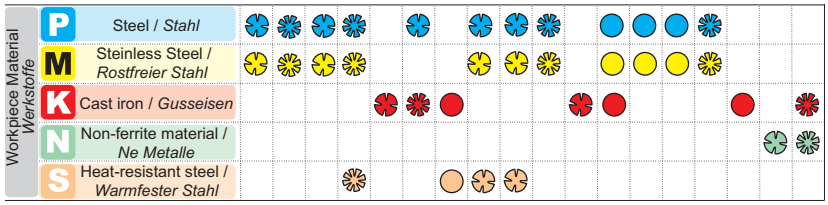
SP**



Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen



Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen				CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	I.C	s	r	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**SPMR090304**	9.525	9.525	3.18	0.4			●															
	SPMR09T304	9.525	9.525	3.97	0.4			●															
	SPMR090308	9.525	9.525	3.18	0.8			●															
	SPMR120304	12.7	12.7	3.18	0.4			●															
	SPMR120308	12.7	12.7	3.18	0.8			●	●														
	SPMR120312	12.7	12.7	3.18	1.2			●	●														

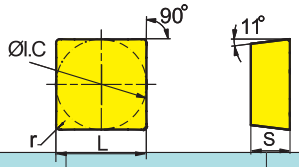
Applicable tool B9-B15
Werkzeug

Inserts code key B153-B154
WSP ISO

Grade selection guide B17-23
Sortenauswahl

Technical data B182-B188
Technische Daten

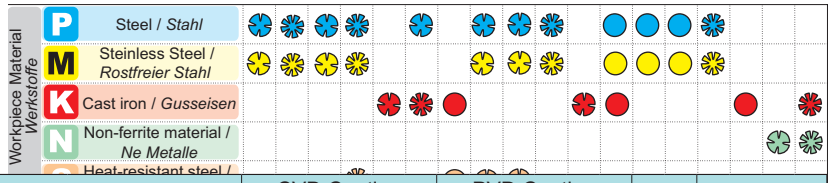
SP**



Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

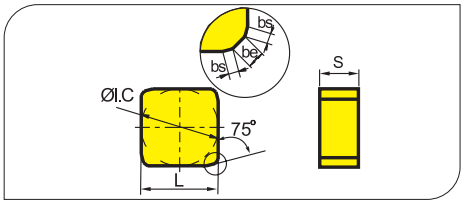
Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen



Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen				CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	I.C	s	r	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**SPUN090304**	9.525	9.525	3.18	0.4															●			
	SPUN090308	9.525	9.525	3.18	0.8															●			
	SPUN120304	12.7	12.7	3.18	0.4															●			
	SPUN120308	12.7	12.7	3.18	0.8			●												●			●
	SPUN120312	12.7	12.7	3.18	1.2															●			●
	SPUN150408	15.875	15.875	4.76	0.8															●			●
	SPUN150412	15.875	15.875	4.76	1.2															●			●
	SPUN190408	19.05	19.05	4.76	0.8															●			
	SPUN190412	19.05	19.05	4.76	1.2															●			
	SPUN190416	19.05	19.05	4.76	1.6																		
	**SPGN090304**	9.525	9.525	3.18	0.4																		
	SPGN090308	9.525	9.525	3.18	0.8															●			
	SPGN120304	12.7	12.7	3.18	0.4															●			
	SPGN120308	12.7	12.7	3.18	0.8								●							●			
	SPGN120404	12.7	12.7	4.76	0.4																		
	SPGN120408	12.7	12.7	4.76	0.8																		
	SPGN120412	12.7	12.7	4.76	1.2																		
	SPGN150404	15.875	15.875	4.76	0.4																		
	SPGN150408	15.875	15.875	4.76	0.8																		
	SPGN150412	15.875	15.875	4.76	1.2															●			
	SPGN190408	19.05	19.05	4.76	0.8															●			
	SPGN190416	19.05	19.05	4.76	1.6																		

● Ex Stock / ab Lager ○ On demand / auf Anfrage

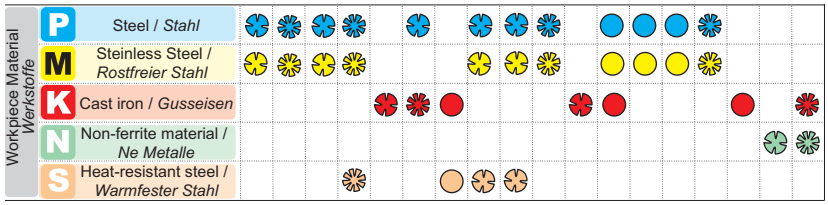
SN**



Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen



Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	I.C	S	be	bs	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**SNKN1204ENN**	12.7	12.7	4.76	0.9	1.5	●			●	●										●			●
	SNKN1504ENN	15.875	15.875	4.76	0.9	1.5	●			○											●			
	SNKN1904ENN	19.05	19.05	4.76	1.0	1.5						○												

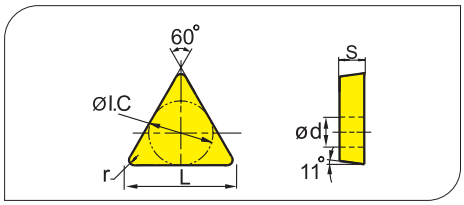
Applicable tool B9-B15
Werkzeug

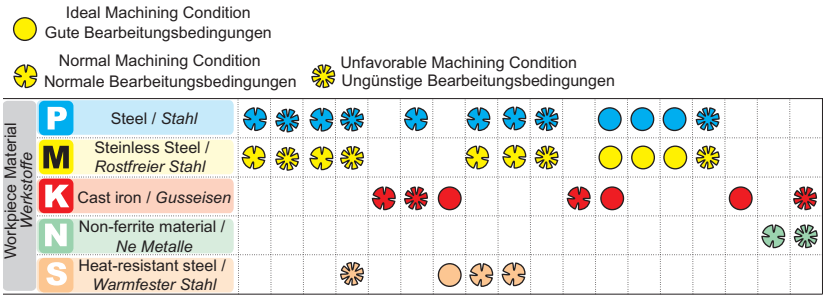
Inserts code key B153-B154
WSP ISO

Grade selection guide B17-23
Sortenauswahl

Technical data B182-B188
Technische Daten

TP**

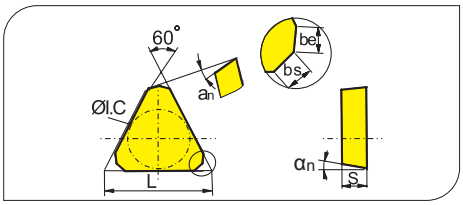




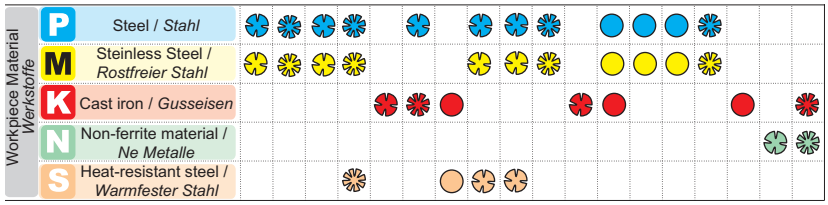
Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen						CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	I.C	bs	be	an	S	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**TPCN1103PPS22PN** (TPCN1103PP)	11	6.35	0.7	0.7	11°	3.18															○			
	TPCN1603PPS42PN (TPCN1603PP)	16.5	9.525	1.2	1.2	11°	3.18	○							○							○			
	TPCN2204PDFR	22	12.7	1.4	1.4	15°	4.76																	○	
	TPCN2204PDSKR (TPCN2204PDR)	22	12.7	1.4	1.4	15°	4.76	○														●			
	TPCN2204PPEN (TPCN2204PPN)	22	12.7	1.4	1.4	11°	4.76	○																	
	TPAN1103PPS22PN (TPAN1103PP)	11	6.35	0.7	0.7	11°	3.18	○							○							○			
	TPAN1603PPS42PN (TPAN1603PP)	16.5	9.525	1.2	1.2	11°	3.18	○							○							○			
	TPAN2204PDER (TPAN2204PDR)	22	12.7	1.4	1.4	15°	4.76															○			
	TPAN2204PDFR	22	12.7	1.4	1.4	11°	4.76																		○

● Ex Stock / ab Lager ○ On demand / auf Anfrage

TP**



Ideal Machining Condition
Gute Bearbeitungsbedingungen
Normal Machining Condition
Normale Bearbeitungsbedingungen
Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen

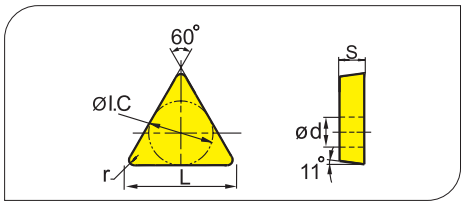


Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen						CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	l.C	S	be	bs	an	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**TPKN1603PDSKR** (TPKN1603PDR)	16.5	9.525	3.18	1.2	1	15°	●	●	○	○			○	●	●	○					●			
	TPKN1603PDSKL (TPKN1603PDL)	16.5	9.525	3.18	1.2	1	11°																		
	TPKN1603PPER (TPKN1603PPR)	16.5	9.525	3.18	1.2	1	11°	●	○													●			
	TPKN1603PPFR (TPKN1603PPR)	22	12.7	4.76	1.4	0.7	11°								○										●
	TPKN2204PDSKR (TPKN2204PDR)	22	12.7	4.76	1.4	0.7	11°	●	●					●	●	●	○					●			
	TPKN2204PPS22PL (TPKN2204PDL)	22	12.7	4.76	1.4	0.7	11°	●														●			
	TPKN2204PDS41PR (TPKN2204PDTR)	22	12.7	4.76	1.4	0.7	11°	○							○							●			

(old Materialnr. / alte Artikelnr.)

Applicable tool B9-B15
Werkzeug
Inserts code key B153-B154
WSP ISO
Grade selection guide B17-23
Sortenauswahl
Technical data B182-B188
Technische Daten

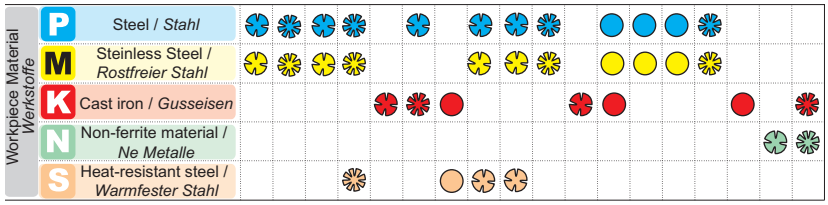
TP**



Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

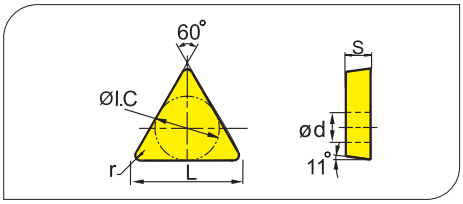
Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen



Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen				CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	I.C	s	r	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**TPGN090204**	9.6	5.56	2.38	0.4																		
	TPGN090208	9.6	5.56	2.38	0.8																		
	TPGN110204	11	6.35	2.38	0.4																		
	TPGN110304	11	6.35	3.18	0.4																		
	TPGN110308	11	6.35	3.18	0.8																		
	TPGN160304	16.5	9.525	3.18	0.4																	●	
	TPGN160308	16.5	9.525	3.18	0.8																		●
	TPGN160312	16.5	9.525	3.18	1.2																		
	TPGN160316	16.5	9.525	3.18	1.6																		
	TPGN220308	22	12.7	4.76	0.8																		
	TPGN220404	22	12.7	4.76	0.4																		
	TPGN220408	22	12.7	4.76	0.8																		
	TPGN220412	22	12.7	4.76	1.2																		
	TPGN270408	27.5	15.875	4.76	0.8																		

● Ex Stock / ab Lager ○ On demand / auf Anfrage

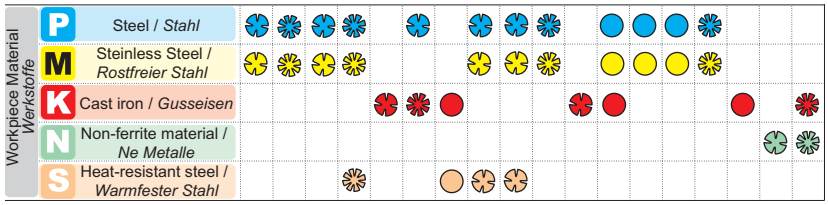
TP**



Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen



Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen				CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	I.C	s	r	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**TPUN110208**	11	6.35	2.38	0.8																		
	TPUN110304	11	6.35	3.18	0.4			●												●			
	TPUN110308	11	6.35	3.18	0.8			●												●			
	TPUN160304	16.5	9.525	3.18	0.4			●												●			●
	TPUN160308	16.5	9.525	3.18	0.8			●	●											●			
	TPUN160312	16.5	9.525	3.18	1.2			●												●			●
	TPUN160408	16.5	9.525	4.76	0.8																		
	TPUN160412	16.5	9.525	4.76	1.2																		
	TPUN220404	22	12.7	4.76	0.4															●			
	TPUN220408	22	12.7	4.76	0.8			●												●			
	TPUN220412	22	12.7	4.76	1.2				●														●
	TPUN220416	22	12.7	4.76	1.6																		
	**TPMR090204**	9.6	5.56	2.38	0.4			●															
	TPMR110304	11	6.35	3.18	0.4			●															
	TPMR110308	11	6.35	3.18	0.8			●															
	TPMR160304	16.5	9.525	3.18	0.4			●	●											●			
	TPMR160308	16.5	9.525	3.18	0.8			●	●											●			
	TPMR160312	16.5	9.525	3.18	1.2			●	●														
	TPMR220412	22	12.7	4.76	1.2			●															
	TPMR330916	33	19.05	9.52	1.6																		

Applicable tool B9-B15
Werkzeug

Inserts code key B153-B154
WSP ISO

Grade selection guide B17-23
Sortenauswahl

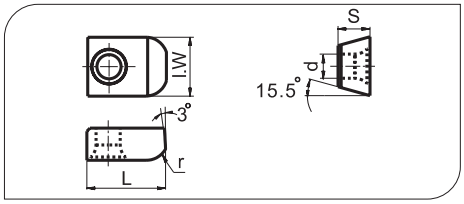
Technical data B182-B188
Technische Daten

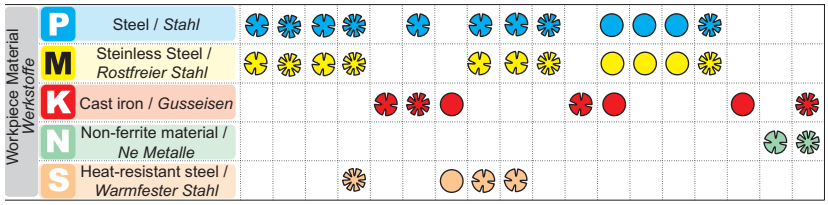
XE**

Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen





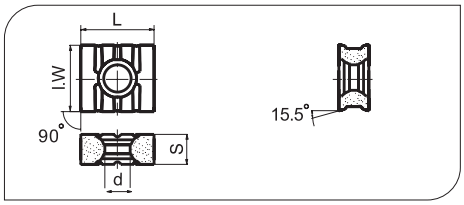
Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	I.W	S	d	r	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**XEEN1406**	14.0	11.5	6.0	4.6	4.0	●																	

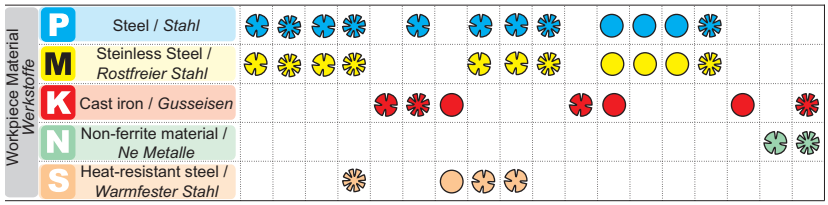
XE**

Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen



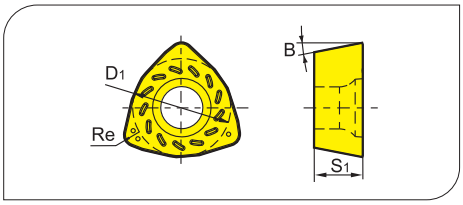


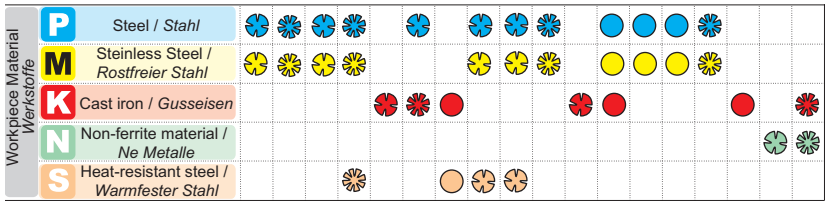
Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		L	I.W	S	d		YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**XEEQ1205**	12.7	11.5	5.4	4.4		○	●																

● Ex Stock / ab Lager ○ On demand / auf Anfrage

Applicable inserts · Wendeschneidplatten

Ideal Machining Condition
Gute Bearbeitungsbedingungen
Normal Machining Condition
Normale Bearbeitungsbedingungen
Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen

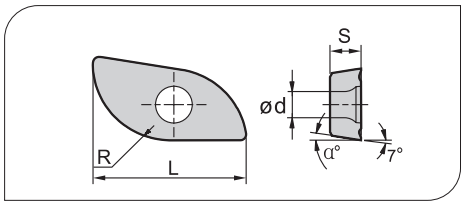


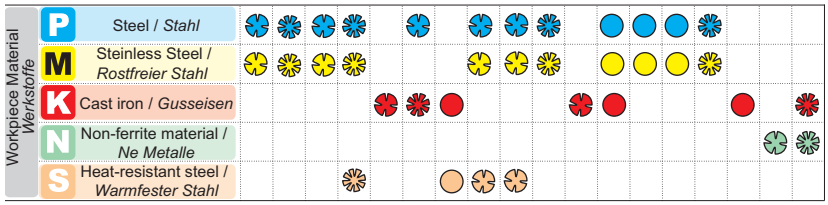


Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen				CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		B	Re	S_1	D_1	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**WPGT050315ZSR**	11°	1.5	3.5	7.94				●														
	WPGT060415ZSR	11°	1.5	4.2	9.525				●														
	WPGT080615ZSR	11°	1.5	6.35	12.85				●					●									
	WPGT090725ZSR	11°	2.5	7	15				●														

XP**

Ideal Machining Condition
Gute Bearbeitungsbedingungen
Normal Machining Condition
Normale Bearbeitungsbedingungen
Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen

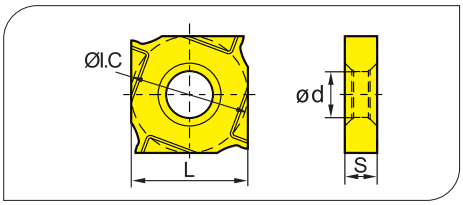




Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		R	d	S	α°	L	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**XPHT16R0803-GM**	8	3.1	3.18	9	16										●								
	XPHT20R10T3-GM	10	4.0	3.97	9	20										●								
	XPHT25R1204-GM	12.5	4.7	4.76	9	25										●								
	XPHT30R1506-GM	15	5.8	6.35	11	30										●								
	XPHT32R1606-GM	16	5.8	6.35	9	32										●								
	XPHT40R2007-GM	20	6.8	7.94	9	40										○								
	XPHT50R2507-GM	25	9.2	7.94	9	50										○								

Applicable tool B9-B15
Werkzeug
Inserts code key B153-B154
WSP ISO
Grade selection guide B17-23
Sortenauswahl
Technical data B182-B188
Technische Daten

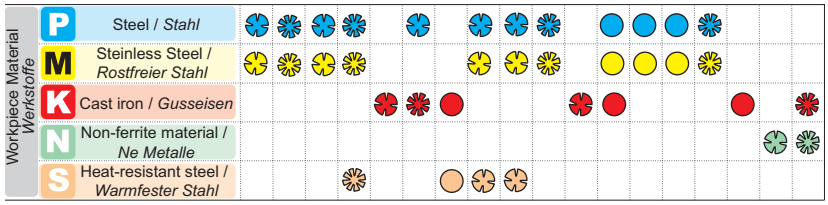
XS**



Ideal Machining Condition
Gute Bearbeitungsbedingungen

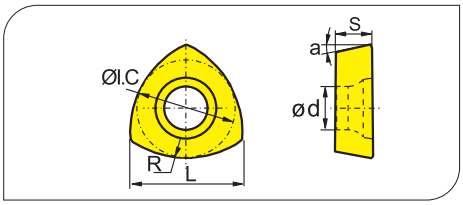
Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen



Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen				CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		I.C	L	S	d	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**XSEQ1202**	12.7	12.7	2.6	5.0																		
	XSEQ1203	12.7	12.7	3.0	5.0										○								
	XSEQ12T3	12.7	12.7	3.8	5.0	○									○								
	XSEQ1204	12.7	12.7	4.0	5.0										○								
	XSEQ12T4	12.7	12.7	4.8	5.0																		

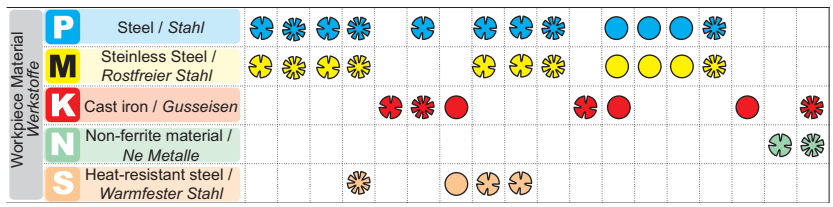
ZD**



Ideal Machining Condition
Gute Bearbeitungsbedingungen

Normal Machining Condition
Normale Bearbeitungsbedingungen

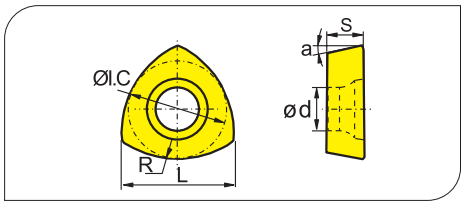
Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen



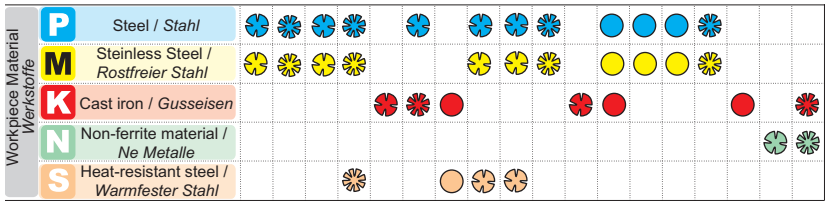
Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen						CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		I.C	L	S	R	d	α	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**ZDET08T2CYR10**	6.75	8.4	2.78	10	2.8	14°			●															
	ZDET1103CYR12.5	8.5	10.6	3.18	12.5	2.8	14°			●															
	ZDET13T3CYR16	10.5	13.2	3.97	16	4.4	14°																		
	ZDET13T3CYR16-PM	10.5	13.2	3.97	16	4.4	14°			●															

● Ex Stock / ab Lager ○ On demand / auf Anfrage

ZP**

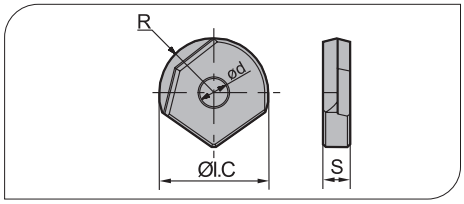


Ideal Machining Condition
Gute Bearbeitungsbedingungen
Normal Machining Condition
Normale Bearbeitungsbedingungen
Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen

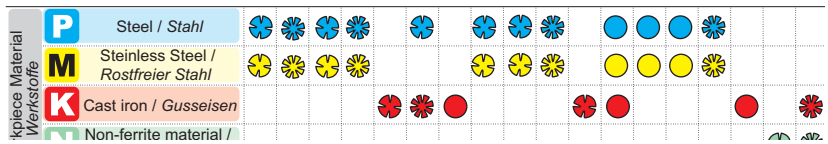


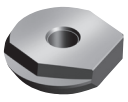
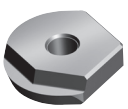
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		I.C	L	S	R	d	α	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**ZPNT2204CY(R20)**	12.7	16.1	4.76	20	5.56	11°			○															
	ZPNT2204CY(R25)	12.7	16.9	4.76	25	5.56	11°			●															
	ZPNT2204CY(R31)	12.7	17.6	4.76	31.5	5.56	11°			●															

ZO**



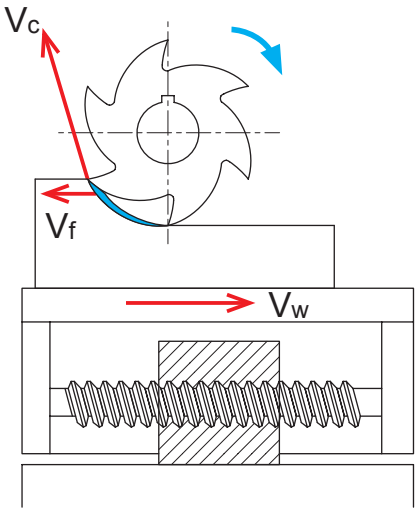
Ideal Machining Condition
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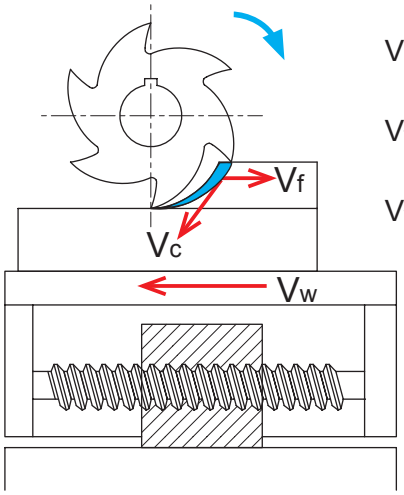


Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen				CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		R	I.C	S	d	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**ZOHX1203-GF**	6	12	3	4												●						
	ZOHX1604-GF	8	16	4	5												●						
	ZOHX2005-GF	10	20	5	5												●						
	ZOHX2506-GF	12.5	25	6	6												●						
	ZOHX3007-GF	15	30	7	8												●						
	ZOHX3207-GF	16	32	7	8												●						
	**ZOHX1203-GM**	6	12	3	4												●						
	ZOHX1604-GM	8	16	4	5												●						
	ZOHX2005-GM	10	20	5	5												●						
	ZOHX2506-GM	12.5	25	6	6												●						
	ZOHX3007-GM	15	30	7	8												●						
	ZOHX3207-GM	16	32	7	8												●						

Applicable tool B9-B15
Werkzeug
Inserts code key B153-B154
WSP ISO
Grade selection guide B17-23
Sortenauswahl
Technical data B182-B188
Technische Daten

Difference and selection between down milling and up milling
Unterscheid zwischen Gleichlauf- und Gegenlauf





Vc = Cutting Speed
Schnittgeschwindigkeit

Vf = Feedrate tool
Vorschub Werkzeug

Vw = Feedrate Workpiece
Vorschub Werkstück

Up milling
Gegenlauffräsen

Down milling
Gleichlauffräsen

1. Down milling (climb milling): the feed direction of workpiece is the same as that of the milling rotation at the connecting position.

1. Beim Gleichlauffräsen sind die Drehrichtung des Fräswerkzeuges und die Vorschubrichtung des Werkstückes gleich gerichtet.

2. Up milling (conventional milling): the feed direction of workpiece is opposite to that of the milling rotation at the connecting position

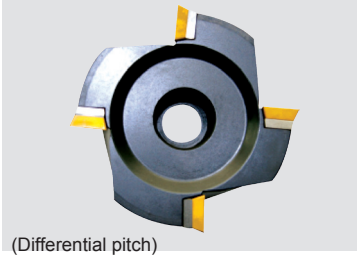
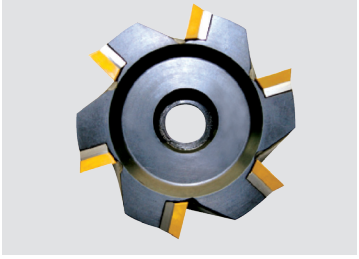
2. Beim Gegenlauffräsen ist die Drehrichtung des Fräswerkzeuges und die Vorschubrichtung des Werkstückes entgegengesetzt.

Advantage and Disadvantage · Vor- und Nachteile:

Direction Richtung	Advantage Vorteil	Disadvantage Nachteil
Up milling Gegenlauffräsen	Prevent hooking of tool, more smooth cut Verhindert das Einhaken des Werkzeuges, ruhigerer Lauf	Bigger stress on cutting edge,tool life shorter Größere Belastung für den Schneidstoff, kürzere Standzeiten
Down milling Gleichlauffräsen	Higher tool life, less thermal stress Höhere Standzeiten, weniger thermische Belastung	Hooking of tool possible Einkaken des Werkzeuges möglich

Pitch selection · Fräserteilung

Pitch is the distance between one point on one cutting edge and the same point on the next edge. Milling cutters are mainly classified into coarse, close and extra close pitches,
Als Fräserteilung wird der Abstand von einer Schneidenecke zur nächsten Schneidenecke bezeichnet. Die Einteilung erfolgt in weite (differential), enge und extra enge Teilung.

Operational stability · Bearbeitungsstabilität		
L (Low/ Niedrig)	**M** (Medium/ Mittel)	**H** (High/Hoch)
Coarse pitch· weite Teilung  (Differential pitch)	Close pitch · Enge Teilung 	Extra close pitch Extra Enge TeilungExtra 
When the milling width equal to diameter of cutter, the machining system is stable and main power of machine is sufficient, selecting coarse pitch can achieve high productive efficiency. Ist die Fräsbreite gleich dem Fräserdruchmesser, die Maschinen in sich stabil, und mit genügend Leistung, wird eine weite Teilung verwendet, um eine hohe Produktivität zu erreichen.	General milling function and multiple mixed productions Erste Wahl für allgemeine Fräsbearbeitung und Mischbearbeitung	When the milling width is less than diameter of cutter, cutting by maximum edges can achieve high productive efficiency. Ist die Fräsbreite kleiner als der Fräserdurchmesser, ermöglicht eine große Schneidenanzahl eine hohe Produktivität. Für alle Materialien geeignet, besonders auch bei hochwarmfesten Werkstoffen.

Selection of approach angle · Einstellwinkel

The approach angle is composed by insert and tool body, Chip thickness, cutting forces and tool-life are affected especially by the approach angle. Decreasing the approach angle reduces chip thickness and spreads the cutting area between cutting edge and workpiece for a given feed rate.
A smaller approach angle also guarantee that it is stable entrying into or exiting workpiece, to protect the cutting edge and extend tool life. However this will increase higher axial cutting forces on the workpiece, thus is not suitable for machining thin workpiece such as thin plate.

Approach angle Einstellwinkel	Feed rate per tooth Zahnvorschub	Real max. cutting depth Max. Spandicke
90°	f_z	$h_{ex}=f_z \times sinkr$
75°	f_z	$h_{ex}=0.96 \times f_z$
60°	f_z	$h_{ex}=0.86 \times f_z$
45°	f_z	$h_{ex}=0.707 \times f_z$
Round insert	f_z	$h_{ex}=\frac{\sqrt{iC^2 \times (iC-2a_p)^2}}{iC} \times f_z$

Der Einstellwinkel eines Planfräsers steht in Verbindung
mit der Spandicke. Dies ist der Winkel zwischen der Hauptschneide der Wendeschneidplatte und der Werkstückoberfläche. Spandicke, Schnittkräfte und Standzeit werden insbesondere durch den Einstellwinkel beeinflusst. Durch Verringern des Einstellwinkels wird die Spandicke bei einer gegebenen Vorschubrate kleiner. Dieser Effekt führt dazu, dass sich die Werkstückstoffmenge über einen größeren Teil der Schneidkante verteilt. Ein kleiner Einstellwinkel sorgt auch für einen weniger abrupten Eintritt in den Schnitt, wodurch der radiale Druck sinkt und die Schneidkante geschont wird. Die höheren axialen Kräfte verstärken jedoch den Druck auf das Werkstück. Für die Bearbeitung von dünnwandigen Bauteilen nicht geeignet.

General formula · Allgemeine Formeln

V_c : cutting speed (m/min)
Schnittgeschwindigkeit (m/min)

D_c : nominal diameter of milling tool (mm)
Sollmaß von Fräswerkzeugen (mm)

n : spindle speed (rev/min)
Umdrehungsgeschwindigkeit (u/min)

z_n : number of teeth
Zähne Anzahl

Q : metal removal rate (cm^3/min)
Material Abtragungsrate (cm^3/min)

V_f: feed rate of worktable (feed speed) (mm/min)
Vorschub der Maschinentisch (feed speed) (mm/min)

f_z : feed rate per tooth (mm/z)
Zahnvorschub (mm/z)

π : circumference ratio≈3.14
Kreiszahl ~3,4

T_c : machining time (min)
Maschinen Zeit (min)

f_z : feed rate per revolution (mm/rev)
Vorschub pro Umdrehung (mm/u)

● Cutting speed · Schnittgeschwindigkeit

$$V_c = \frac{\pi \times D_c \times n}{1000} \text{ (m/min)}$$

● Spindle speed · Umdrehungsgeschwindigkeit

$$n = \frac{1000 \times V_c}{\pi \times D_c} \text{ (rev/min)}$$

● Feed rate of worktable (feed speed)

● Vorschub des Maschinentisch

$$V_f = f_z \times n \times z_n \text{ (mm/min)}$$

● Feed rate per tooth · Zahnvorschub

$$f_z = \frac{V_f}{n \times Z_n} \text{ (mm/z)}$$

● Feed rate per revolution · Vorschub pro Umdrehung

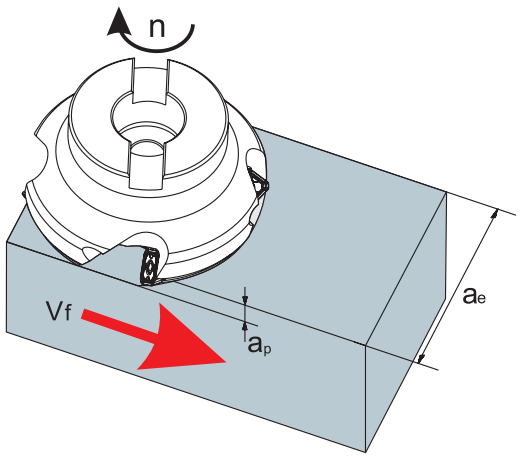
$$f_n = \frac{V_f}{n} \text{ (mm/rev)}$$

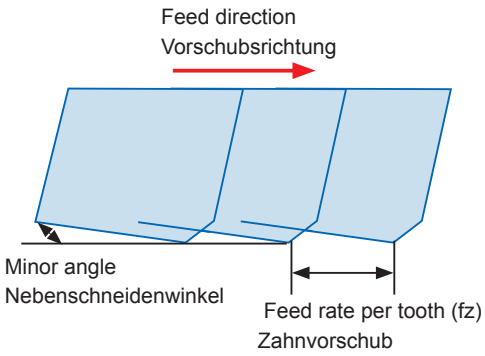
● Machining time · Bearbeitungszeit

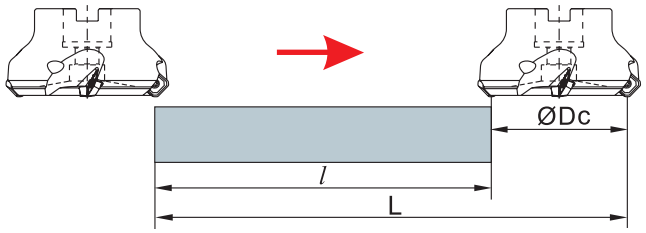
$$T_c = \frac{1000 \times V_c}{\pi \times D_c} \text{ (min)}$$

● Metal removal rate · Zerspanungsvolumen

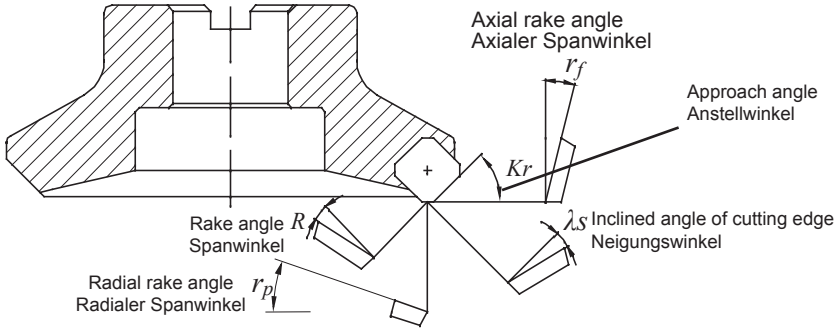
$$Q = \frac{a_p \times a_e \times V_f}{1000} \text{ (cm}^3\text{/min)}$$







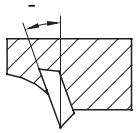
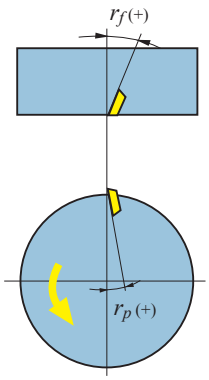
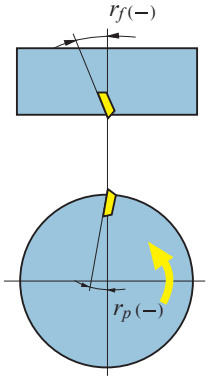
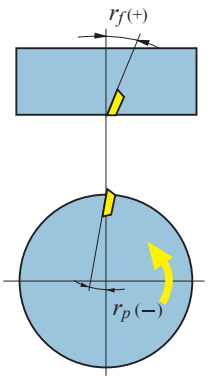
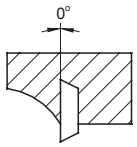
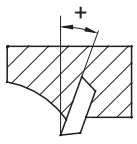
Function of each part in face milling · Winkelfunktion beim Planfräsen



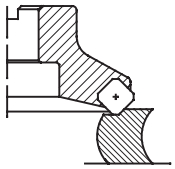
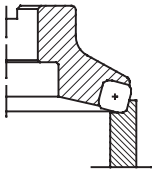
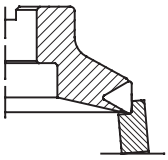
Main angles of face mills · Winkel beim Planfräsen

Designation Winkel	Function Funktion	Effect Auswirkung		
Axial rake angle Axialer Spanwinkel r_f	Determining the chip direction Beeinflusst die Spanflußrichtung	negative angle, excellent chip removal Negativer <Spanwinkel, gute Späneabfuhr		
Radial rake angle Radialer Spanwinkel r_p	Determining sharpness of cutting edge Definiert die Schneidenschärfe	Positive angle, good cutting performance Positive Winkel, gute Schnittleistung		
Approach angle Anstellwinkel Kr	Determining the chip thickness Beeinflusst die Spandicke	Kr↑,chip thickness↑,Kr↓,chip thickness↓; Kr↑,Spandicke↑,Kr↓,chip Spandicke↓;		
Rake angle Spanwinkel R	Determining true sharpness of cutting edge Beeinflusst die wahre Plattenschärfe	Poor cutting performance, high strength of cutting edge Schlechte Schnittleistung, starke Schneidkante	(−)←0→(+)	Good cutting performance, low strength of cutting edge Schlechte Schnittleistung, starke Schneidkante
Inclined angle of cutting edge Neigungswinkel λs	Determining the chip flow direction Beeinflusst die Spanflußrichtung	Poor cutting performance, high strength of cutting edge Gute Schnittleistung, schwächere Schneidkante	(−)←0→(+)	Good cutting performance, low strength of cutting edge Gute Schnittleistung, schwächere Schneidkante

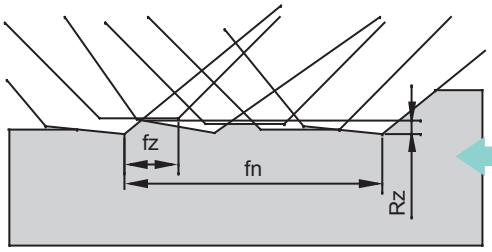
Combination of different rake angels · Kombination von verschiedenen Spanwinkeln

		Double positive Doppelt Positiv	Double negative Doppelt Negativ	One pos., one neg. Postitiv/Negativ
Negative rake angle Negativer Span-winkel				
0° rake angle Neutraler Winkel				
Positive rake angle Positiver Span-winkel				
Axial rake angle r_f / axialer SW		+	−	+
Radial rake angle r_p radialer SW		+	−	−
Applicable material machined Anwendungs-bereich	P	√		√
	M	√		√
	K		√	√
	N	√		
	S	√		√

Cutting performances of different approach angles

Approach angle Anstellwinkel	Schematic diagram Darstellung	Instruction Erklärung
45°		Axial force is largest. It will bend when machining thin-wall workpiece, and reduces the precision of workpiece. It is benefit to avoid fringe breakage of workpiece when machining cast iron Die axiale Kraft ist sehr hoch. Wegen der Verbiegung nicht geeignet für die Bearbeitung von dünnwandigen Bauteilen. Optimal für die Planbearbeitung von Stahl, Guss und rostfreien Materialien.
75°		The main purpose is to resolve the radial cutting force, it is often used for general face milling. Zur Reduzierung der radialen Kräfte. Für die allgemeine Planbearbeitung.
90°		The axial force is zero in theory, suitable for milling thin plate workpiece. Die axiale Kraft ist nahezu null. Für die Zerspanung von dünnen, labilen Werkstücken geeignet.

Wiper insert · Wiper Platte

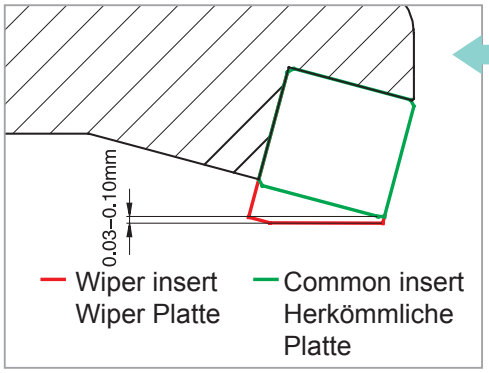


Required Surface roughness with common insert isn´t good.

Geforderte Oberflächengüte mit herkömmlichen Platten wird nicht erreicht.

Solution · Lösung

Aassembling wiper inserts
Einsatz von Wiper Platten

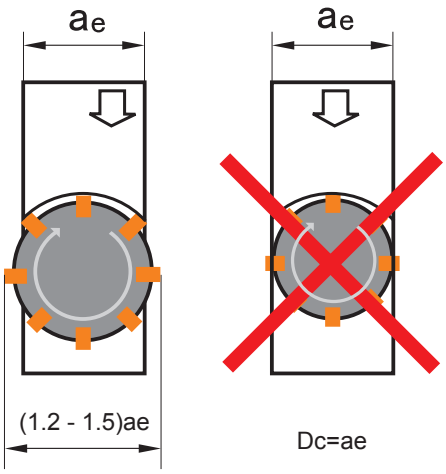


usage · Anwendung

The wiper insert must protrude below the other inserts by 0.03-0.10 mm at axial direction, only that the wiping function can take into effect.
Generally speaking, a cutter can just assemble only one wiper insert. If the diameter of cutter is much bigger or cutter's feed rate per revolution is bigger than the length of wiper edge, 2 to 3 wiper inserts can be assembled.

Die Wiperplatte muss ca. 0,03 – 0,1 mm über den normalen Platten in axialer Richtung stehen, um den Wipereffekt zu erreichen.
Bei Standarddurchmessern reicht eine Wiperplatte.
Bei sehr großen Fräserdurchmessern oder großen Vorschubraten können bis zu 3 Wiperplatten eingesetzt werden.

Selection of cutting width and tool cutting diameter in face milling
Schnittbreiten Auswahl und Werkzeug Durchmesser beim Planfräsen

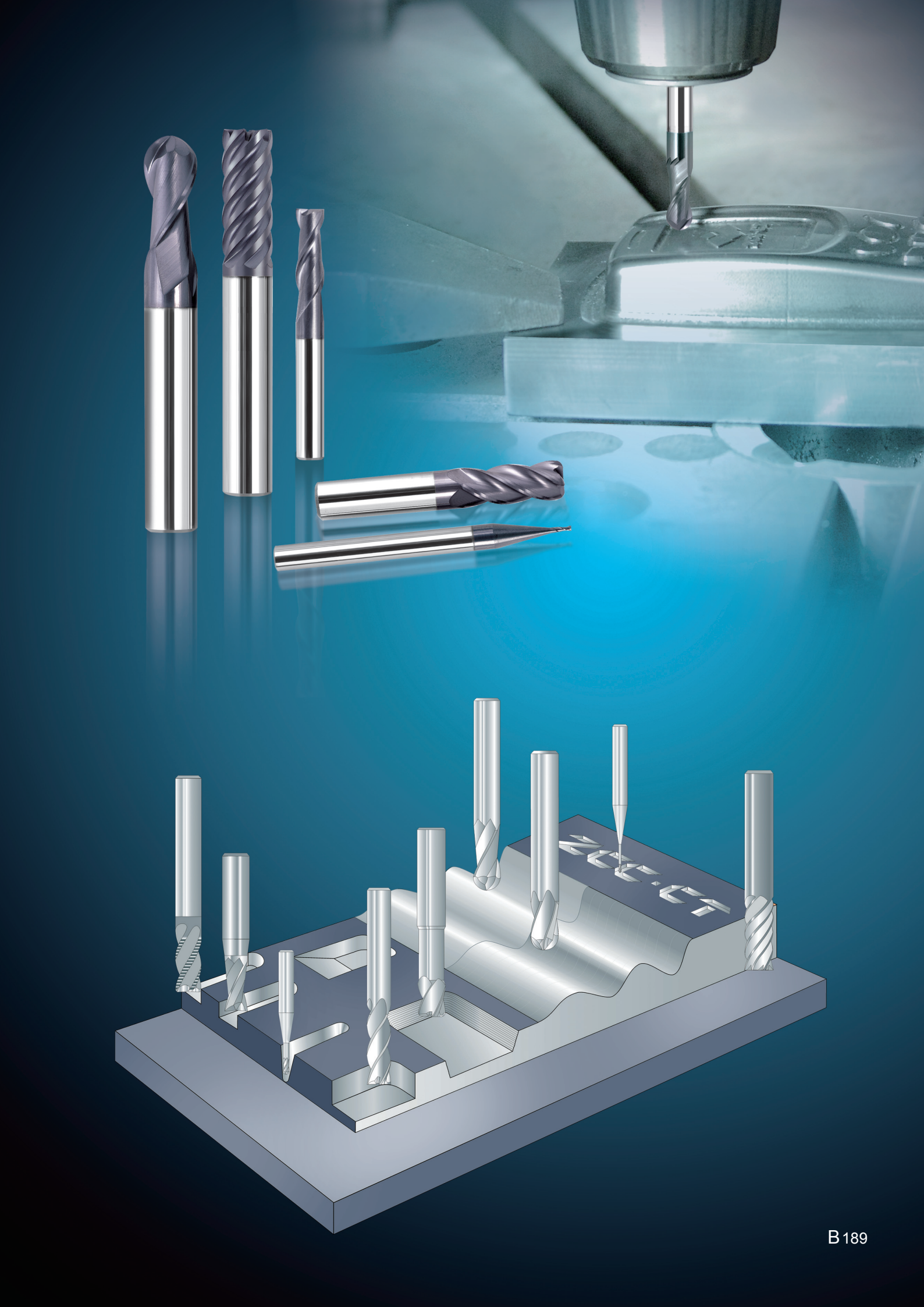


Generally speaking, the relation between cutting width and tool cutting diameter is Dc=(1.2—1.5) ae. In the machining practice, it need to avoid coincidence of tool center and workpiece center as much as possible.

In der allgemeinen Anwendung sollte der Fräserdurchmesser 1.2 – 1,5 mal ae betragen.
Positionieren Sie den Fräser leicht außermittig.

Dc: Diameter of milling tool · Werkzeugdurchmesser
ae: Cutting width · Seitliche Zustellung

NOTIZEN:





Milling · Fräsen

Solid Carbide End Mills · Vollhartmetallschaftfräser

B 191-193 Solid carbide end mills overview
Vollhartmetall-Schaftfräser Überblick

B 194-195 Grade introduction for solid carbide end mills
Sortenbeschreibung für VHM Fräser

B 196-198 Solid carbide end mills code key
Vollhartmetall-Schaftfräser ISO Kennzeichung

B 197-199 Graphics identification and application
Graphische Werkzeug- und Anwendungsbeschreibung

B 200-292 Solid carbide end mills program
Vollhartmetall-Schaftfräser Programm

B 200-242 **GM series** + **DIN** and **ZCC CT** Norm for **general machining**
GM Serie + **DIN** und **ZCC CT** Norm für **allgemeine Bearbeitung**

B 243-268 **HM series** + **DIN** and **ZCC CT** Norm for machining **high hardness steel**
HM Serie + **DIN** und **ZCC CT** Norm für die **Hartbearbeitung**

B 269-275 **NM series** for machining **copper**
NM Serie für die **Kupferbearbeitung**

B 276-289 **AL series** for machining aluminum
AL Serie für die Bearbeitung von **Aluminiumlegierungen**

B 290-292 **SM series** for machining of **heat resostance super alloys**
SM Serie für die Bearbeitung von **warmfesten Superlegierungen**

B 293-368 Recommended cutting parameters
Empfohlene Schnittdaten

B 369-371 Technical information
Technische Informationen

B 373-374 Order form for non-standard products
Bestellformular für Sonderwerkzeuge

Machining Bearbeitung	Shape Ausführung	Teeth · Zähne	NORM	Type · Typ	Serie	Ø	material · Material							Page Seite	
							P		M	K	N		S	H	
							Carbon steel alloy steel	Kohlenstoff Stahl Legierter Stahl	Stainless steel · Rostfreier Stahl	Cast iron Grauguss	Copper alloy Kupfer Legierung	Aluminum alloy Alu Legierung	Heat resist. alloy Warmfeste Leg.	Hardened steel gehärteter Stahl	Specification Spezifikation	Cutting data Schnittdaten
General machining · Allgemeine Bearbeitung	End mill · Eckfräser	2	DIN	5501R302GM		Ø3.0~Ø20.0	✔	✔	✔	✔			✔	✔		
				5601R302GM		Ø3.0~Ø20.0	✔	✔	✔	✔			✔	✔		
				5502R302GM		Ø3.0~Ø20.0	✔	✔	✔	✔			✔	✔		
				5602R302GM		Ø3.0~Ø20.0	✔	✔	✔	✔			✔	✔		
				GM-2EL		Ø3.0~Ø20.0	✔	✔	✔	✔			✔	✔		
		3	DIN	5501R303GM		Ø3.0~Ø20.0	✔	✔	✔	✔			✔	✔		
				5601R303GM		Ø3.0~Ø20.0	✔	✔	✔	✔			✔	✔		
				5502R303GM		Ø3.0~Ø20.0	✔	✔	✔	✔			✔	✔		
				5602R303GM		Ø3.0~Ø20.0	✔	✔	✔	✔			✔	✔		
				5502R453GM		Ø3.0~Ø20.0	✔	✔	✔	✔			✔	✔		
				5602R453GM		Ø3.0~Ø20.0	✔	✔	✔	✔			✔	✔		
		4	DIN	5501R304GF		Ø3.0~Ø20.0	✔	✔	✔	✔			✔	✔		
				5601R304GF		Ø3.0~Ø20.0	✔	✔	✔	✔			✔	✔		
				5502R304GF		Ø3.0~Ø20.0	✔	✔	✔	✔			✔	✔		
				5602R304GF		Ø3.0~Ø20.0	✔	✔	✔	✔			✔	✔		
				5501R38414GM	New	Ø4.0~Ø20.0	✔	✔	✔	✔			✔	✔		
				5502R38414GM	New	Ø4.0~Ø20.0	✔	✔	✔	✔			✔	✔		
				5602R38414GM	New	Ø4.0~Ø20.0	✔	✔	✔	✔			✔	✔		
				5508R454GM		Ø3.0~Ø20.0	✔	✔	✔	✔				✔		
				5602R454GM		Ø3.0~Ø20.0	✔	✔	✔	✔				✔		
				GM-4E		Ø1.0~Ø20.0	✔	✔	✔	✔			✔	✔		
				GM-4EL		Ø3.0~Ø20.0	✔	✔	✔	✔			✔	✔		
		6	DIN	5589R45MGFR		Ø6.0~Ø20.0	✔	✔	✔	✔			✔	✔		
				GM-6EL		Ø6.0~Ø20.0	✔	✔	✔	✔			✔	✔		
	Micro end mill Micro-fräser	2		GM-2EP		Ø0.5~Ø5.0	✔	✔	✔	✔			✔	✔		
				GM-2ES		Ø0.3~Ø3.0	✔	✔	✔	✔			✔	✔		
	Ball nose · Kugelkopffräser	2	DIN	5565R302GF		Ø3.0~Ø16.0	✔	✔	✔	✔				✔		
				5665R202GM		Ø3.0~Ø20.0	✔			✔				✔		
				5566R302GF		Ø3~Ø12.0	✔			✔				✔		
				GM-2BL		R1.0~R10.0	✔	✔	✔	✔				✔		
		4		GM-4B		R1.5~R10.0	✔	✔	✔	✔			✔	✔		
	Micro ball nose Micro Kugelkopf-fräser	2		GM-2BS		R0.15~R1.5	✔	✔	✔	✔			✔	✔		
				GM-2BP		R0.25~R2.5	✔	✔	✔	✔			✔	✔		

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

Milling · Fräsen

Solid Carbide end mills Overview · Vollhartmetallschaftfräser Übersicht

Machining Bearbeitung	Shape Ausführung	Teeth · Zähne	NORM	Type · Typ	Serie	Ø	material · Material							Page Seite	
							P		M	K	N		S	H	
							Carbon steel alloy steel / Kohlenstoff Stahl Legierter Stahl		Stainless steel · Rostfreier Stahl	Cast iron Grauguss	Copper alloy Kupfer Legierung	Aluminum alloy Alu Legierung	Heat resist. alloy Warmfeste Leg.	Hardened steel gehärteter Stahl	Specification Spezifikation	Cutting data Schnittdaten
General machining Allgemeine Bearbeitung	Corner Radius mills Radiuseck-fräser	2		GM-2R		Ø1.0~Ø12.0	✔			✔			✔	✔		
		4	DIN	5585R304GHR		Ø6.0~Ø16.0	✔			✔				✔		
				GM-4R		Ø3.0~Ø12.0	✔			✔			✔	✔		
			DIN	5586R304GHR		Ø6.0~Ø16.0	✔			✔				✔		
				GM-4RL		Ø6.0~Ø16.0	✔			✔			✔	✔		
	Roughing end mills, fine pitch form Schruppfräser, fein verzahnt	4	DIN	5602R304GR		Ø10.0~Ø20.0	✔			✔			✔	✔		
				GM-4W		Ø6.0~Ø20.0	✔			✔			✔	✔		
Machining high hardness steel · Hartbearbeitung	End mill Eckfräser	4		HM-4E		Ø1.0~Ø20.0				✔				✔		
				HM-4EL		Ø3.0~Ø20.0				✔				✔		
			DIN	5502R55MHH		Ø3.0~Ø20.0				✔				✔		
		6		HM-6EL		Ø6.0~Ø20.0				✔				✔		
	Micro end mill Microfräser	2		HM-2EP		Ø0.5~Ø5.0				✔				✔		
				HM-2ES		Ø0.3~Ø3.0				✔				✔		
	Ball nose Kugelkopf-fräser		DIN	5565R302GH		Ø3.0~Ø16.0				✔				✔		
				5566R302GH		Ø3.0~Ø12.0				✔				✔		
				HM-2B		R0.5~R10.0				✔				✔		
			DIN	5565R302HH		Ø3.0~Ø16.0				✔				✔		
				5566R302HH		Ø3.0~Ø12.0				✔				✔		
				HM-2BL		R1.0~R10.0				✔				✔		
				HM-2BFP		R0.5~R10.0				✔				✔		
		4	DIN	5566R304HH		Ø6.0~Ø12.0				✔				✔		
				HM-4B		R1.5~R10.0				✔				✔		
	Micro end mill Microfräser	2		HM-2BS		R0.15~R1.5				✔				✔		
				HM-2BP		R0.25~R2.5				✔				✔		
	Corner Radius mills Radiuseck-fräser	4	DIN	5585R554HHR		Ø6.0~Ø16.0				✔				✔		
				5685R554HHR		Ø6.0~Ø16.0				✔				✔		
				HM-4R		Ø3.0~Ø12.0				✔				✔		
				HM-4RF		Ø6.0~Ø12.0				✔				✔		
				HM-4RP		Ø6.0~Ø16.0				✔				✔		

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✔ = Suitable · Empfohlen

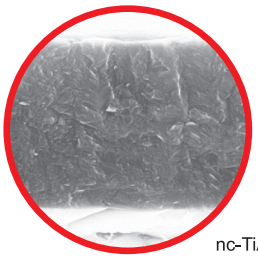
Machining Bearbeitung	Shape Ausführung	Teeth · Zähne	NORM	Type · Typ	Serie	Ø	material · Material							Page Seite	
							P	M	K	N		S	H		
							Carbon steel alloy steel / Kohlenstoff Stahl/ Legierter Stahl	Stainless steel Rostfreier Stahl	Cast iron Grauguss	Copper alloy Kupfer Legierung	Aluminum alloy Alu Legierung	Heat resist. alloy Warmfeste Leg.	Hardened steel gehärteter Stahl	Specification Spezifikation	Cutting data Schnittdaten
Machining copper Kupferbearbeitung	End mill Eckfräser	2	DIN	**5502R402NM**		Ø6.0~Ø20.0				✔					
				NM-2E	New	Ø1.0~Ø12.0				✔					
		4		**NM-4E**	New	Ø3.0~Ø12.0				✔					
	Micro end mill Microfräser	2		**NM-2EP**	New	Ø0.5~Ø5.0				✔					
	Ball nose Kugelkopffräs.			**NM-2B**	New	R0.5~R6.0				✔					
	Micro end mill Microfräser			**NM-2BP**	New	R0.25~R2.5				✔					
Machining aluminum Aluminium Bearbeitung	End mill Eckfräser	2		**AL-2E**		Ø1.0~Ø20.0					✔				
				AL-2EL		Ø3.0~Ø20.0					✔				
		3		**AL-3E**		Ø1.0~Ø20.0					✔				
	Ball nose Kugelkopffräs.	2	DIN	**5565R302NH**		Ø3.0~Ø16.0					✔				
				5566R302NH		Ø3.0~Ø16.0					✔				
				AL-2B		R1.0~R6.0					✔				
	Roughing end mills, rough pitch form Schruppfräser, fein verzahnt	3		**AL-3W**	New	Ø6.0~Ø20.0					✔				
	Radius (extra high speed) Radius Hoch-geschwindig.	2	DIN	**5585R302NHR**		Ø6.0~Ø20.0					✔				
				AL-2R-AIR		Ø6.0~Ø20.0					✔				
			DIN	**5586R302NHR**		Ø6.0~Ø20.0					✔				
				AL-2RL-AIR	New	Ø6.0~Ø20.0					✔				
		3		**AL-3R-AIR**		Ø12.0~Ø20.0					✔				
				AL-3RL-AIR	New	Ø12.0~Ø20.0					✔				
Machining heat resistance super alloys Warmfeste Superlegierung Bearb.	End mill Eckfräser	3	DIN	**5502R453GM**		Ø3.0~Ø20.0	✔	✔	✔			✔			
				5602R453GM		Ø3.0~Ø20.0	✔	✔	✔			✔			
		4		**VSM-4E**	New	Ø4.0~Ø20.0	✔	✔				✔			
				SM-4R		Ø6.0~Ø12.0	✔	✔✔	✔			✔✔			

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✔ = Suitable · Empfohlen

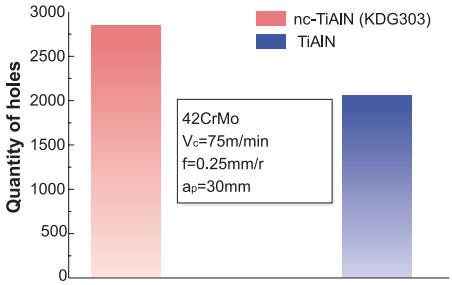
Outstanding performances of the tools come from:
Hochleistungswerkzeuge kommen aus:

Nano structure nc-TiAlN PVD coating:
- High wear resistance
- Outstanding thermal and chemical stability-suitable for dry and wet machining

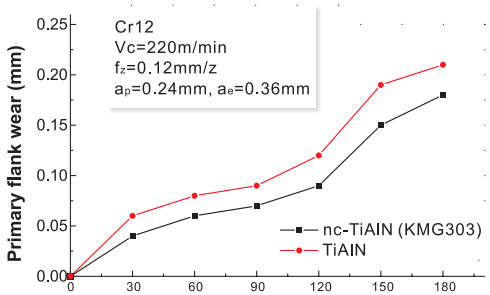
NC-TiAlN PVD Beschichtung mit Nano-Struktur
- *Hohe Verschleißfestigkeit*
- *Ausgezeichnete thermale und chemische Stabilität*
- *Geeignet für die Nass- und Trockenbearbeitung.*



nc-TiAlN coating



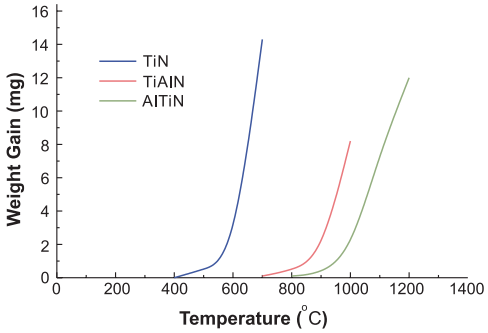
Drilling / *Bohren* (f=0.25mm/r)

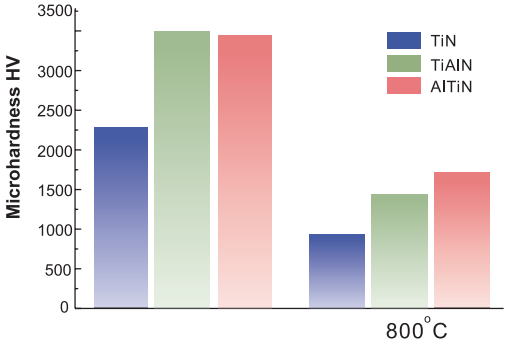


Milling / *Fräsen* (min)

Nano structure AlTiN PVD coating:
- AlTiN PVD coating with high content of Al and nano structure
- Keeping higher hardness under high temperatures and thermal stability
- excellent wear resistance under hard cutting and high speed cutting

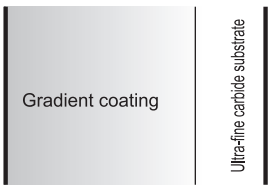
AlTiN PVD Beschichtung mit Nano-Struktur
- *AlTiN PVD Beschichtung mit höherem Al-Inhalt und Nano-Struktur*
- *Höhere Härte bei hoher Temperatur und thermaler Stabilität*
- *Ausgezeichnete Verschleißfestigkeit bei der Hartbearbeitung und Hochgeschwindigkeitsbearbeitung*



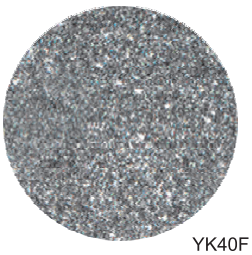


Gradient structure gt-TiCN PVD coating
- Gt-TiCN PVD coating with the gradient structure
- High wear resistance
- Super adhesion of the coating on the substrate
- Special for high precision boring tools

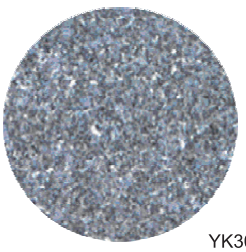
Gradierte Struktur PVD Beschichtung
- *Gt-TiCN PVD Beschichtung mit gradierter Struktur*
- *Hohe Verschleißfestigkeit*
- *Sehr gute Haftung der Beschichtung auf dem Substrat*
- *Gut geeignet für hochpräzise Bohrwerkzeuge*



Ultra-fine cemented carbide
Urtrafeinkorn-Hartmetall



YK40F



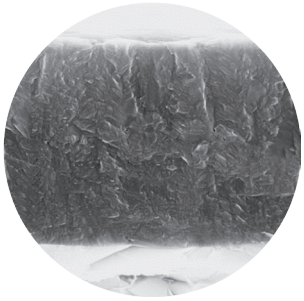
YK30F

Grade introduction for solid carbide end mills
Hartmetallsorten für VHM-Fräser

Coated Grades
Beschichtete Sorten



Common TiAlN coating
normale TiAlN Beschichtung



nc-TiAlN coating
nc-TiAlN Beschichtung

KMG303

It is a combination of ultra-fine carbide substrate and Nano nc-TiAlN coating. It is a universal grade for milling of carbon steel, alloy steel(HRC<=48), cast iron and stainless steel. It can be for the machining of Ni based high-temperature alloys at a normal cutting speed.

Eine Kombination von Ultrafeinkorn-Hartmetall und Nano nc-TiAlN PVD-Beschichtung. Universelle Anwendung zum Fräsen von unlegiertem Stahl, legiertem Stahl (HRC<=48), Guss, rostfreiem Stahl und Ni-basierten, warmfesten Superlegierungen bei normale Schnittgeschwindigkeit.

KMG405

It is a combination of ultra-fine carbide substrate of high strength, toughness and wear resistance with Nano AlTiN (TiAlN) coating and it is suitable for milling of stainless steel, Ti alloys, high-temperature alloys. High-strength materials. Alloy steel and cast iron. It is an optimal grade for the high speed milling of hardened materials (HRC48-63).

Ultrafeinkorn-Hartmetall mit hoher Zugfestigkeit, Zähigkeit und Verschleißfestigkeit, plus Nano-AlTiN (TiAlN) *PVD-Beschichtung. Zum Hartfräsen und HSC-Fräsen von legiertem Stahl (HRC 48-63) und Guss. Sehr gut geeignet für die Bearbeitung von rostfreiem Stahl, Ti-Legierungen, warmfesten Superlegierungen.*

KMG555

It is an optimal combination of superfine carbide substrate of significantly higher wear resistance and high strength with Nano AlTixN coating.It's a special solution for high speed cutting, hard machining until HRC70 and dry machining.

Superfeinkorn-Hartmetall mit deutlich höherer Verschleißfestigkeit und hoher Zugfestigkeit, plus Nano-AltixN Beschichtung. Sonderlösungen für HSC-Fräsen, Hartbearbeitung bis HRC 70 und Trockenbearbeitung.

Uncoated Grades
Unbeschichtete Sorten

YK30F

It is an ultra-fine carbide grade with good wear resistance and it is a universal grade for milling cutters.

Ultrafeinkorn-Hartmetall mit guter Verschleiß-festigkeit. Universelle Sorte zum Fräsen

YK40F

It is an ultra-fine carbide grade with good wear resistance suitable for manufacturing milling cutters in the high speed milling of aluminium alloys.

Ultrafeinkorn-Hartmetall mit guter Verschleißfestigkeit. Geeignet für HSC-Fräser zu Aluminiumbearbeitung.

DIN - STANDARD

Type of function Schneidenausführung	
code	Description Beschreibung
0	End mill Eckfräser
6	Ball nose end mill Kugelkopffräser
8	Radius end mill Fräser mit Eckradius

Helical angle / Spiralwinkel			
00	0°	45	45°
20	20°	55	55°
30	30°	60	60°

Number of teeth Anzahl Zähne	
code	Description Beschreibung
2-4	Number of teeth Anzahl Zähne
M	It is indicated by M when the same type is with different sizes and number of teeth. Wird angegeben, wenn verschiedene Durchmesser verschiedene Zähnezahlen haben.

Type of tools Werkzeugtype	
code	Description Beschreibung
5	End mills / Fräser

Direction of rotation Drehrichtung	
code	Description Beschreibung
R	Right hand / Rechts
L	Left hand / Links

Radius	
code	Description Beschreibung
R05	Radius: 0.5 mm

Durchmesser	
code	Description Beschreibung
0800	8.0 mm in diameter Durchmesser: 8.0mm

5 5 0 1 R 30 2 GM R05 0800

Type of shank Schaftausführung	
code	Description · Beschreibung
1	Shank · Schaft
5	DIN 6535 HA
6	Weldon DIN 6535 HB
7	Whistel-Notch DIN 6535 HE
9	Taper shank · Morsekegel

Tool shape Ausführung	
code	Description · Beschreibung
1	DIN 6527 K
2	DIN 6527 L
5	As per ZCC-A in QJ ZZQ(TQ)01.002.002 between the radius and the specification Nach Werksnorm ZCC-A
6	As per ZCC-B in QJ ZZQ(TQ)01.002.002 between the radius and the specification Nach Werksnorm ZCC-B
8	DIN 6528
9	As per ZCC-D in QJ ZZQ(TQ)01.002.002 between the radius and the specification Nach Werksnorm ZCC-D

Machining Bearbeitung	
code	Description · Beschreibung
GR	General roughing Allgemeine Schruppbearbeitung
NR	Roughing machining of nonferrous metals Schruppen von NE-Metallen
GM	General semi-finishing Allgemeine mittlere Bearbeitung
SR	Machining of Ti alloys and Heat resist. alloys Zur Bearbeitung von Ti-Legierungen und warmfesten Materialien
GF	General finishing Allgemeine Schlichtbearbeitung
NH	High speed machining of nonferrous Metals Hochgeschwindigkeitsbearb. von NE-Metallen
NM	Semi-finishing of nonferrous Metals Mittlere Bearb. von NE-Metallen
HH	High speed machining of hardened materials Hochgeschwindigkeitsbearbeitung von gehärtetem Material (HRC: 52-65)
GH	High speed machining of general material Hochgeschwindigkeitbearb. von Stahl
PR	Roughing of steel Schruppbearbeitung von Stahl

Graphics identification and application
Graphische Werkzeug- und Anwendungsbeschreibung



Cylindrical flattened tool nose
Eckenschutzfase



R end mill nose
Eckenradius



Ball nose end mills
Vollradius



30° helical angle
30° Spiralwinkel



2-tooth mill for center milling with one teeth overpass the center
2-Zähne, ein Zahn über Mitte



2-tooth mill for center milling
2-Zähne mit Zentrumschnitt



3-tooth mill for center milling with one teeth overpass the center
3-Zähne, ein Zahn über Mitte



4-tooth mill for center milling
4-Zähne mit Zentrumschnitt



4-tooth mill not for center milling
4-Zähne stirnseitig im Zentrum frei



Mills with 6 teeth and above not for center milling
6-Zähne oder mehr stirnseitig im Zentrum frei



DIN6535HA straight shank
DIN6535HA Zylinderschaft



DIN6535HB weldon
DIN6535HB Weldonspannfläche



DIN6535HE whistle notch shank
DIN6535HE mit whistle notch Spannfläche



Straight shank
Zylinderschaft



Square and straight shank
Zylinderschaft mit Vierkant



Radial feed
Radiale Bearbeitung



Radial, aslant feed compensated with helical cutting
Bearbeitung: radial, Spiralinterpolation



Radial, aslant feed compensated with helical cutting
Bearbeitung: radial, Spiralinterpolation, Eintauchen



Groove milling
Nutenfräsen



Side milling
Eckfräsen, Umfangfräsen



Profile milling
Profilfräsen



Cutting Data
Schnittdaten

JM - SERIE

Machining Bearbeitung	
GM	Universal machining Allgemeine Bearbeitung
HM	For hard materials machining and high speed cutting Zur Hartbearbeitung im HSC Bereich
NM	For copper and nonferrous metals machining Zur Bearbeitung von Kupfer und NE-Metallen
AL	For aluminum alloy machining Zur Bearbeitung von Alumiumlegierungen
SM	For machining of heat resistant super alloys Zur Bearbeitung von warmfesten Superlegierungen

Type of function Schneidenausführung	
E	End mill Eckfräser
B	Ball nose end mill Kugelkopffräser
R	Radius end mill Fräser mit Eckradius
W	End mills Kordel geometrie Eckfräser Kordel Geometrie

Shrunken neck
Abgesetzter Hals

Radius
Radius

GM -2 E L P -D12 R0.5 -M08

Number of teeth · Anzahl der Zähne

Diameter
Durchmesser

Tool shape Ausführung	
L	Long series · Lange Serie
S	Tiny diameter Micro-Durchmesser
F	Short cutting edge Kurze Schneidenlänge
	Series of standard length Standardlängen Serie

Special size instruction Spezielle Baumaße	
M	Neck length Halslänge
H	Cutting edge length Schneidenlänge
L	Whole length Gesamtlänge
D	Diameter Durchmesser
S	Slim shank (ø 4mm) Schmale Ausführung
AIR	Extra high speed end mills for machining aluminum in aerospace industry High-Speed Fräser für Luftfahrtindustrie

Graphics identification and application
Graphische Werkzeug- und Anwendungsbeschreibung

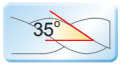
Coated end mills
Beschichtete VHM Fräser

Coated Nano-AlTiN	Nano-AlTiN coating · Nano-AlTiN Beschichtung
Coated/Beschichtung TiAlN	TiAlN coating · TiAlN Beschichtung
Coated/Beschichtung CrN	CrN coating · CrN Beschichtung

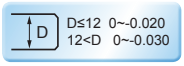
End mill series
VHM Fräser Serie

	2-flute end mills 2-Schneiden Eckfräser
	2-flute ball nose end mills 2-Schneiden Kugelkopffräser
	2-flute R end mills 2-Schneiden Radiuseckfräser
	3-flute end mills 3-Schneiden Eckfräser
	3-flute R end mills 3-Schneiden Radiuseckfräser
	4-flute end mills 4-Schneiden Eckfräser
	4-flute ball nose end mills 4-Schneiden Kugelkopffräser
	4-flute R end mills 4-Schneiden Radiuseckfräser
	6-flute end mills 6-Schneiden Eckfräser

Helical angle
Spiral Winkel

	35° helical angle 35° Spiral Winkel

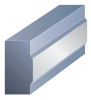
Cutter diameter tolerance
Fräserdurchmesser Toleranz

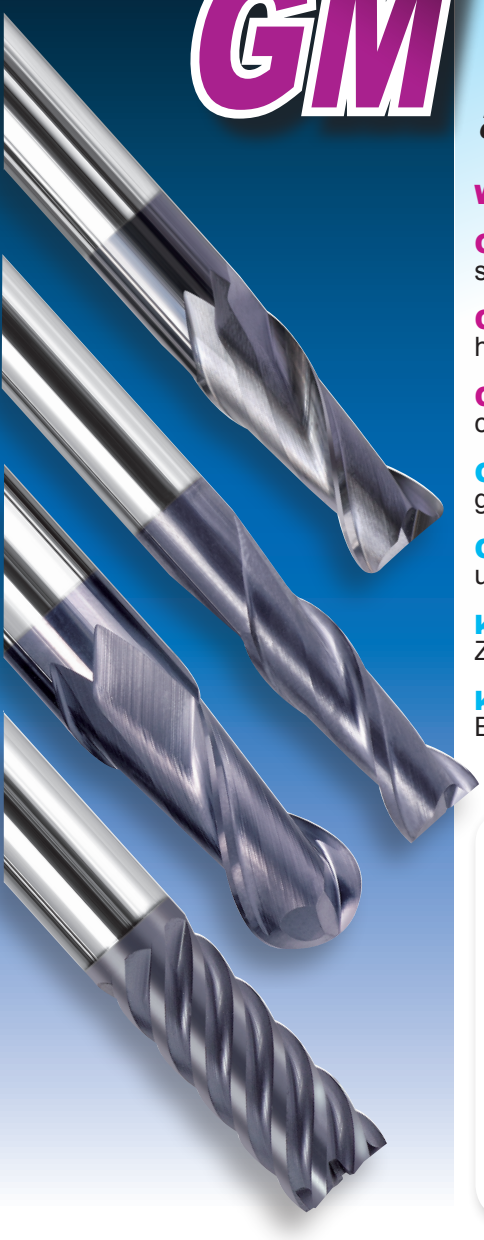
	Cutter diameter tolerance Fräserdurchmesser Toleranz

Radius tolerance of ball nose end mills
Radius Toleranz von Kugelkopffräsern

	Radius tolerance Radius Toleranz

Machining operation
Bearbeitungsform

	side face machining Schulterfräsen
	shoulder machining Eckfräsen
	straight slot machining Nutenfräsen
	deep slot machining Nutenfräsen (tief)
	profile machining Profilfräsen
	cavity machining Auskammern
	slot machining (round) Nutenfräsen (rund)
	deep slot machining (deep,round) Nutenfräsen (tief,rund)
	side machining with radius Radius Eckfräsen
	slot machining with radius Nutenfräsen mit Radius
	profile machining Profilfräsen



GM

Series end mills for general machining

Serie Eckfräser für allgemeine Anwendung

Wide application: high efficiency machining of common steel up to hardend steel.

Optimized structure: reasonable combination of sharp cutting edge and tool strength makes cutting much light and fast, achieving longer tool-life.

Completes Programm (application): covers applications from roughing with high metal removal rate to finish machining with high surface quality.

Completes Programm (dimension): the minimum diameter of 0.3 mm, easily complete machining even though the micro part of workpiece.

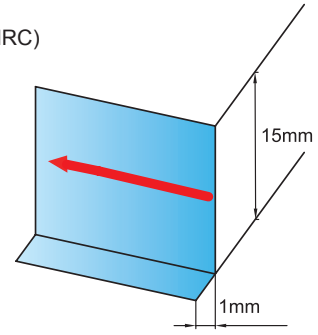
Großer Anwendungsbereich: effiziente Bearbeitung von normalem bis zu gehärtetem Stahl.

Optimiertes Design: Scharfer Schneide mit hoher Kantenstabilität. Für leichte und schnelle Bearbeitung mit hoher Standzeit.

komplettes Programm (Anwendung): vom Schruppen bei hoher Zerspanungsleistung bis Schlichten bei exellenter Werkstück Qualität.

komplettes Programm (Abmessung): ab Durchmesser 0,3mm für die Bearbeitung von kleinen Werkstücken.

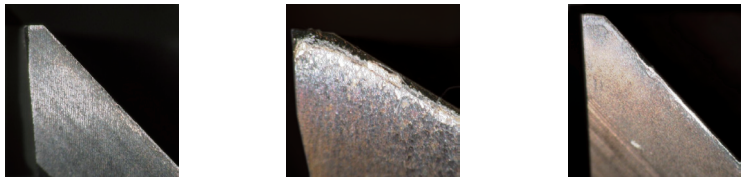
- Tool type: GM-4E-D10.0
- Size: Ø10.0mm
- Workpiece material · Werkstückstoff: NAK80 (40HRC)
- Rotating speed: 3200r/min (100m/min)
- Feed: 640mm/r (0.2mm/r)
- Axial cutting depth
  Axiale Zustellung: Ap=15mm
- Radial cutting depth
  Radiale Zustellung: Ae=1.0mm
- Cutting style: side milling /Eckfräsen
- Cooling system: air blow /Luft
- Machine: MIKRON UCP 1000



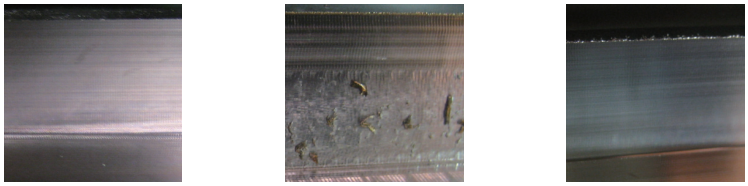
■ Cutting edge wear and surface quality of workpiece · Schneidkantenverschleiß und Werkstück Oberflächenqualität

End mills · Eckfräser	GM-4E-D10.0	Similar product of company A Ähnliches Produkt Firma A	Similar product of company B Ähnliches Produkt Firma B
Cutting length · Schnittlänge	60m	20m	60m

Cutting edge wear
Schneidkantenverschleiß



Workpiece surface quality
Werkstück Qualität

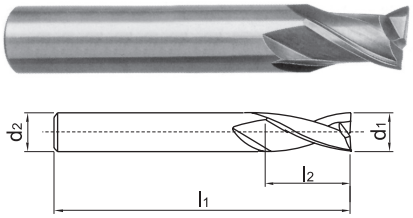


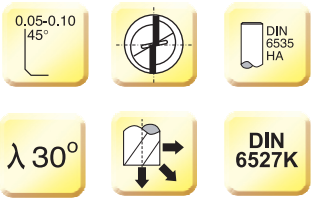
DIN 6527K 2-flute slotting end mills · DIN 6527K 2-Schneiden VHM Langlochfräser



5501R302GM

YK30F: Ultra-fine carbide grade / *Ultrafeinkornhartmetall*
KMG303: nano TiAlN coated ultra-fine carbide / *nano TiAlN beschichtetes Ultrafeinkornhartmetall*





Type *Typ*	Dimension(mm) *Abmessungen*				Teeth *Zähne*	Application *Anwendung*	P M K N S	
	$d_1(e_8)$	$d_2(h_6)$	l_2	l_1	z	Grade	YK30F	KMG303
5501R302GM-0300	3.00	6	4	50	2		○	●
5501R302GM-0400	4.00	6	5	54	2		○	●
5501R302GM-0500	5.00	6	6	54	2		○	●
5501R302GM-0600	6.00	6	7	54	2		○	●
5501R302GM-0800	8.00	8	9	58	2		○	●
5501R302GM-1000	10.00	10	11	66	2		○	●
5501R302GM-1200	12.00	12	12	73	2		○	●
5501R302GM-1400	14.00	14	14	75	2		○	●
5501R302GM-1600	16.00	16	16	82	2		○	●
5501R302GM-1800	18.00	18	18	84	2		○	●
5501R302GM-2000	20.00	20	20	92	2		○	●
						Art. Group No. / *Produktgruppe Nr.* :	**021140**	**021130**

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

KMG303

Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
✔	✔	✔	✔			✔	✔			✔	✔

Code key B194/196
ISO Kennzeichen
Cutting data B293-368
Schnittdaten
Graphics identification & application B195/197
Graphische Werkzeug- & Anwendungsbeschr.
Order form for non-standard products B373-B372
Bestellformular für Sonderwerkzeuge

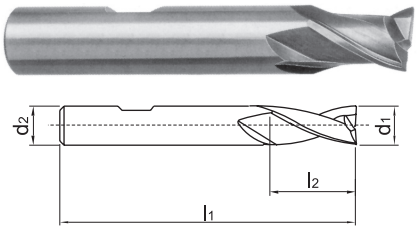
DIN 6527K 2-flute slotting end mills · DIN 6527K 2-Schneiden VHM Langlochfräser

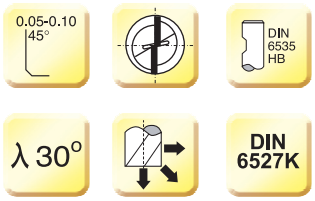




5601R302GM

YK30F: Ultra-fine carbide grade / *Ultrafeinkornhartmetall*
KMG303: nano TiAlN coated ultra-fine carbide / *nano TiAlN beschichtetes Ultrafeinkornhartmetall*





Type *Typ*	Dimension(mm) *Abmessungen*				Teeth *Zähne*	Application *Anwendung*	P M K N S	
	$d_1(e_8)$	$d_2(h_6)$	l_2	l_1	z	Grade	YK30F	KMG303
5601R302GM-0300	3.00	6	4	50	2		○	●
5601R302GM-0400	4.00	6	5	54	2		○	●
5601R302GM-0500	5.00	6	6	54	2		○	●
5601R302GM-0600	6.00	6	7	54	2		○	●
5601R302GM-0800	8.00	8	9	58	2		○	●
5601R302GM-1000	10.00	10	11	66	2		○	●
5601R302GM-1200	12.00	12	12	73	2		○	●
5601R302GM-1400	14.00	14	14	75	2		○	●
5601R302GM-1600	16.00	16	16	82	2		○	●
5601R302GM-1800	18.00	18	18	84	2		○	●
5601R302GM-2000	20.00	20	20	92	2		○	●
						Art. Group No. / *Produktgruppe Nr.* :	**021140**	**021130**

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

Material Overview · Material Übersicht (5502R302GM)

KMG303

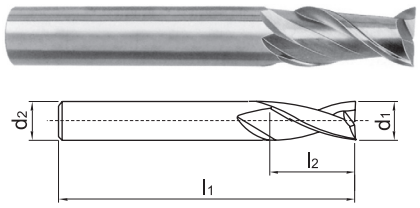
Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy warmfeste leg
		~40HRC	~50HRC	~60HRC	~68HRC						
✔	✔	✔	✔			✔	✔			✔	✔

● Ex Stock / ab Lager ○ On demand / auf Anfrage

DIN 6527L 2-flute slotting end mills · DIN 6527L 2-Schneiden VHM Langlochfräser

5502R302GM

YK30F: Ultra-fine carbide grade / *Ultrafeinkornhartmetall*
KMG303: nano TiAlN coated ultra-fine carbide / *nano TiAlN beschichtetes Ultrafeinkornhartmetall*



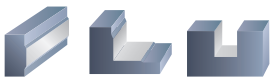


Type *Typ*	Dimension(mm) *Abmessungen*				Teeth *Zähne*	Application *Anwendung*	P M K N S	
	$d_1(e_8)$	$d_2(h_6)$	l_2	l_1	z	Grade	YK30F	KMG303
5502R302GM-0100	1.00	3	2	38	2		○	●
5502R302GM-0150	1.50	3	3	38	2		○	●
5502R302GM-0200	2.00	6	6	57	2		○	●
5502R302GM-0250	2.50	6	7	57	2		○	●
5502R302GM-0280	2.80	6	7	57	2		○	●
5502R302GM-0300	3.00	6	7	57	2		○	●
5502R302GM-0350	3.50	6	7	57	2		○	●
5502R302GM-0380	3.80	6	8	57	2		○	●
5502R302GM-0400	4.00	6	8	57	2		○	●
5502R302GM-0450	4.50	6	8	57	2		○	●
5502R302GM-0480	4.80	6	8	57	2		○	●
5502R302GM-0500	5.00	6	10	57	2		○	●
5502R302GM-0550	5.50	6	10	57	2		○	●
5502R302GM-0575	5.75	6	10	57	2		○	●
5502R302GM-0600	6.00	6	10	57	2		○	●
5502R302GM-0675	6.75	8	13	63	2		○	●
5502R302GM-0700	7.00	8	13	63	2		○	●
5502R302GM-0750	7.50	8	16	63	2		○	●
5502R302GM-0775	7.75	8	16	63	2		○	●
5502R302GM-0800	8.00	8	16	63	2		○	●
5502R302GM-0870	8.70	10	16	72	2		○	●
5502R302GM-0900	9.00	10	16	72	2		○	●
5502R302GM-0950	9.50	10	16	72	2			○
5502R302GM-1000	10.00	10	19	72	2		○	●
5502R302GM-1100	11.00	12	22	83	2			○
5502R302GM-1170	11.70	12	22	83	2		○	●
5502R302GM-1200	12.00	12	22	83	2		○	●
5502R302GM-1370	13.70	14	22	83	2		○	●
5502R302GM-1400	14.00	14	22	83	2		○	●
5502R302GM-1500	15.00	16	26	92	2			○
5502R302GM-1570	15.70	16	26	92	2		○	●
5502R302GM-1600	16.00	16	26	92	2		○	●
5502R302GM-1700	17.00	18	26	92	2			○
5502R302GM-1800	18.00	18	26	92	2		○	●
5502R302GM-2000	20.00	20	32	104	2		○	●
						Art. Group No. / *Produktgruppe Nr.* :	021140	021130

Code key B194/196
ISO Kennzeichen
Cutting data B293-368
Schnittdaten
Graphics identification & application B195/197
Graphische Werkzeug- & Anwendungsbeschr.
Order form for non-standard products B373-B372
Bestellformular für Sonderwerkzeuge

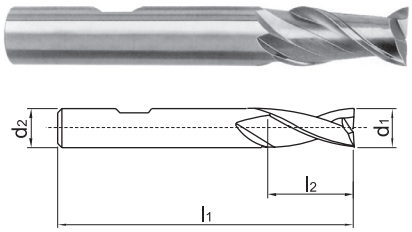
DIN 6527L 2-flute slotting end mills · DIN 6527L 2-Schneiden VHM Langlochfräser

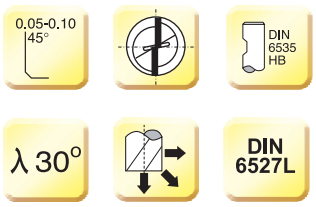




5602R302GM

YK30F: Ultra-fine carbide grade / *Ultrafeinkornhartmetall*
KMG303: nano TiAlN coated ultra-fine carbide / *nano TiAlN beschichtetes Ultrafeinkornhartmetall*





Type *Typ*	Dimension(mm) *Abmessungen*				Teeth *Zähne*	Application *Anwendung*	P M K S	
	$d_1(e_8)$	$d_2(h_6)$	l_2	l_1	z	Grade	YK30F	KMG303
5602R302GM-0200	2.00	6	6	57	2		○	●
5602R302GM-0250	2.50	6	7	57	2		○	●
5602R302GM-0280	2.80	6	7	57	2		○	●
5602R302GM-0300	3.00	6	7	57	2		○	●
5602R302GM-0350	3.50	6	7	57	2		○	●
5602R302GM-0380	3.80	6	8	57	2		○	●
5602R302GM-0400	4.00	6	8	57	2		○	●
5602R302GM-0450	4.50	6	8	57	2		○	●
5602R302GM-0480	4.80	6	8	57	2		○	●
5602R302GM-0500	5.00	6	10	57	2		○	●
5602R302GM-0550	5.50	6	10	57	2		○	●
5602R302GM-0575	5.75	6	10	57	2		○	●
5602R302GM-0600	6.00	6	10	57	2		○	●
5602R302GM-0675	6.75	8	13	63	2		○	●
5602R302GM-0700	7.00	8	13	63	2		○	●
5602R302GM-0750	7.50	8	16	63	2		○	●
5602R302GM-0775	7.75	8	16	63	2		○	●
5602R302GM-0800	8.00	8	16	63	2		○	●
5602R302GM-0870	8.70	10	16	72	2		○	●
5602R302GM-0900	9.00	10	16	72	2		○	●
5602R302GM-1000	10.00	10	19	72	2		○	●
5602R302GM-1170	11.70	12	22	83	2		○	●
5602R302GM-1200	12.00	12	22	83	2		○	●
5602R302GM-1370	13.70	14	22	83	2		○	●
5602R302GM-1400	14.00	14	22	83	2		○	●
5602R302GM-1570	15.70	16	26	92	2		○	●
5602R302GM-1600	16.00	16	26	92	2		○	●
5602R302GM-1800	18.00	18	26	92	2		○	●
5602R302GM-2000	20.00	20	32	104	2		○	●
			Art. Group No. / *Produktgruppe Nr.* :				021140	021130

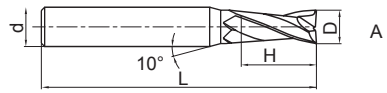
● Ex Stock / ab Lager ○ On demand / auf Anfrage

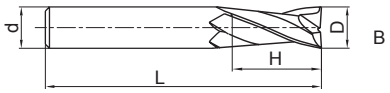
GM-2EL series for general machining · GM-2EL Serie für allgemeine Bearbeitung

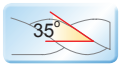
2-flute flattened end mills with straight shank and long cutting edge
2-Schneiden Eckfräser mit langer Schneide und Zylinderschaft

















Type · Typ	Dimension(mm) Abmessungen				Teeth · Zähne Z	Geometry Ausführung	Grade · Sorte KMG 303
	D	d	H	L			
GM-2EL-D3.0	3.0	6	12	75	2	A	○
GM-2EL-D4.0	4.0	6	15	75	2	A	○
GM-2EL-D5.0	5.0	6	20	75	2	A	○
GM-2EL-D6.0	6.0	6	20	75	2	B	○
GM-2EL-D8.0	8.0	8	25	100	2	B	○
GM-2EL-D10.0	10.0	10	30	100	2	B	○
GM-2EL-D12.0	12.0	12	35	100	2	B	○
GM-2EL-D14.0	14.0	14	40	100	2	B	○
GM-2EL-D16.0	16.0	16	50	150	2	B	○
GM-2EL-D20.0	20.0	20	55	150	2	B	○

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

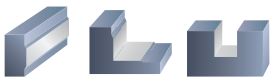
Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
✔	✔	✔	✔			✔	✔			✔	✔

Code key B194/196
ISO Kennzeichen
Cutting data B293-368
Schnittdaten
Graphics identification & application B195/197
Graphische Werkzeug- & Anwendungsbeschr.
Order form for non-standard products B373-B372
Bestellformular für Sonderwerkzeuge

DIN 6527K 3-flute slotting end mills · DIN 6527K 3-Schneiden VHM Langlochfräser

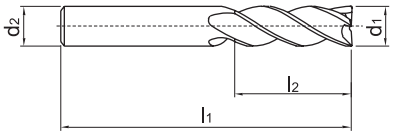


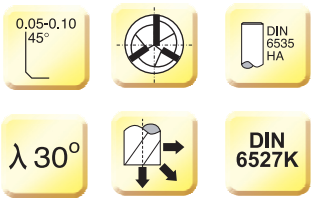
5501R303GM



YK30F: Ultra-fine carbide grade / *Ultrafeinkornhartmetall*
KMG303: nano TiAlN coated ultra-fine carbide / *nano TiAlN beschichtetes Ultrafeinkornhartmetall*







Type *Typ*	Dimension(mm) *Abmessungen*				Teeth *Zähne*	Application *Anwendung*	P M K N S	
	$d_1(e_8)$	$d_2(h_6)$	l_2	l_1	z	Grade	YK30F	KMG303
5501R303GM-0300	3.00	6	4	50	3		○	●
5501R303GM-0400	4.00	6	5	54	3		○	●
5501R303GM-0500	5.00	6	6	54	3		○	●
5501R303GM-0600	6.00	6	7	54	3		○	●
5501R303GM-0800	8.00	8	9	58	3		○	●
5501R303GM-1000	10.00	10	11	66	3		○	●
5501R303GM-1200	12.00	12	12	73	3		○	●
5501R303GM-1400	14.00	14	14	75	3		○	●
5501R303GM-1600	16.00	16	16	82	3		○	●
5501R303GM-1800	18.00	18	18	84	3		○	●
5501R303GM-2000	20.00	20	20	92	3		○	●
						Art. Group No. / *Produktgruppe Nr.* :	**021140**	**021130**

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

KMG303

Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
✔	✔	✔	✔			✔	✔			✔	✔

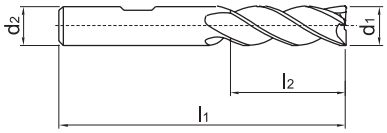
● Ex Stock / ab Lager ○ On demand / auf Anfrage

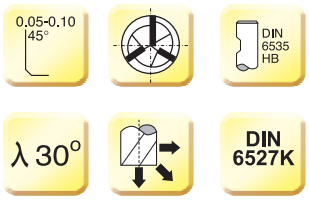
DIN 6527K 3-flute slotting end mills · DIN 6527K 3-Schneiden VHM Langlochfräser

5601R303GM

YK30F: Ultra-fine carbide grade / *Ultrafeinkornhartmetall*
KMG303: nano TiAlN coated ultra-fine carbide / *nano TiAlN beschichtetes Ultrafeinkornhartmetall*







Type *Typ*	Dimension(mm) *Abmessungen*				Teeth *Zähne*	Application *Anwendung*	P M K N S	
	$d_1(e_8)$	$d_2(h_6)$	l_2	l_1	z	Grade	YK30F	KMG303
5601R303GM-0300	3.00	6	4	50	3		○	●
5601R303GM-0400	4.00	6	5	54	3		○	●
5601R303GM-0500	5.00	6	6	54	3		○	●
5601R303GM-0600	6.00	6	7	54	3		○	●
5601R303GM-0800	8.00	8	9	58	3		○	●
5601R303GM-1000	10.00	10	11	66	3		○	●
5601R303GM-1200	12.00	12	12	73	3		○	●
5601R303GM-1400	14.00	14	14	75	3		○	●
5601R303GM-1600	16.00	16	16	82	3		○	●
5601R303GM-1800	18.00	18	18	84	3		○	●
5601R303GM-2000	20.00	20	20	92	3		○	●
						Art. Group No. / *Produktgruppe Nr.* :	**021140**	**021130**

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

KMG303

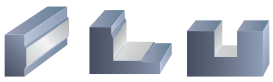
Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
✔	✔	✔				✔	✔			✔	✔

Code key B194/196
ISO Kennzeichen
Cutting data B293-368
Schnittdaten
Graphics identification & application B195/197
Graphische Werkzeug- & Anwendungsbeschr.
Order form for non-standard products B373-B372
Bestellformular für Sonderwerkzeuge

DIN 6527L 3-flute slotting end mills · DIN 6527L 3-Schneiden VHM Langlochfräser

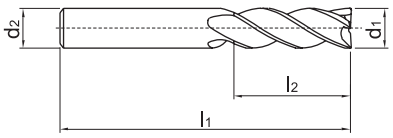


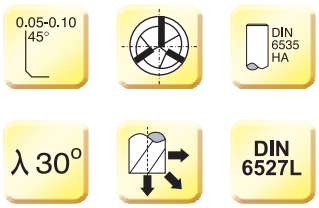
5502R303GM



YK30F: Ultra-fine carbide grade / *Ultrafeinkornhartmetall*
KMG303: nano TiAlN coated ultra-fine carbide / *nano TiAlN beschichtetes Ultrafeinkornhartmetall*







Type *Typ*	Dimension(mm) *Abmessungen*				Teeth *Zähne*	Application *Anwendung*	P M K N S	
	$d_1(h_{10})$	$d_2(h_6)$	l_2	l_1	z	Grade	YK30F	KMG303
5502R303GM-0300	3.00	6	7	57	3		○	●
5502R303GM-0400	4.00	6	8	57	3		○	●
5502R303GM-0500	5.00	6	10	57	3		○	●
5502R303GM-0600	6.00	6	10	57	3		○	●
5502R303GM-0800	8.00	8	16	63	3		○	●
5502R303GM-1000	10.00	10	19	72	3		○	●
5502R303GM-1200	12.00	12	22	83	3		○	●
5502R303GM-1400	14.00	14	22	83	3		○	●
5502R303GM-1600	16.00	16	26	92	3		○	●
5502R303GM-1800	18.00	18	26	92	3		○	●
5502R303GM-2000	20.00	20	32	104	3		○	●
						Art. Group No. / *Produktgruppe Nr.* :	**021140**	**021130**

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

Material Overview · Material Übersicht

KMG303

Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
✔	✔	✔				✔	✔			✔	✔

● Ex Stock / ab Lager ○ On demand / auf Anfrage

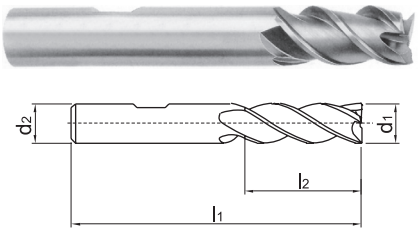
DIN 6527L 3-flute slotting end mills · DIN 6527L 3-Schneiden VHM Langlochfräser



5602R303GM



YK30F: Ultra-fine carbide grade / *Ultrafeinkornhartmetall*
KMG303: nano TiAlN coated ultra-fine carbide / *nano TiAlN beschichtetes Ultrafeinkornhartmetall*





Type *Typ*	Dimension(mm) *Abmessungen*				Teeth *Zähne*	Application *Anwendung*	P M K N S	
	$d_1(h_{10})$	$d_2(h_6)$	l_2	l_1	z	Grade	YK30F	KMG303
5602R303GM-0300	3.00	6	7	57	3		○	●
5602R303GM-0400	4.00	6	8	57	3		○	●
5602R303GM-0500	5.00	6	10	57	3		○	●
5602R303GM-0600	6.00	6	10	57	3		○	●
5602R303GM-0800	8.00	8	16	63	3		○	●
5602R303GM-1000	10.00	10	19	72	3		○	●
5602R303GM-1200	12.00	12	22	83	3		○	●
5602R303GM-1400	14.00	14	22	83	3		○	●
5602R303GM-1600	16.00	16	26	92	3		○	●
5602R303GM-1800	18.00	18	26	92	3		○	●
5602R303GM-2000	20.00	20	32	104	3		○	●
						Art. Group No. / *Produktgruppe Nr.* :	**021140**	**021130**

Material Overview · Material Übersicht

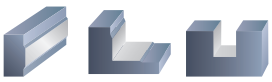
✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

KMG303

Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
✔	✔	✔				✔	✔			✔	✔

Code key B194/196 ISO Kennzeichen
Cutting data B293-368 Schnittdaten
Graphics identification & application B195/197 Graphische Werkzeug- & Anwendungsbeschr.
Order form for non-standard products B373-B372 Bestellformular für Sonderwerkzeuge

DIN 6527L 3-flute end mills · DIN 6527L 3-Schneiden VHM Schaftfräser

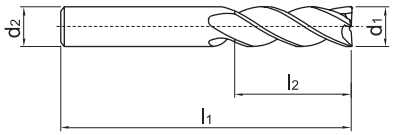




5502R453GM

KMG405: nano TiAlN coated ultra-fine carbide / *nano TiAlN beschichtetes Ultrafeinkornhartmetall*







Type *Typ*	Dimension(mm) *Abmessungen*				Teeth *Zähne*	Application *Anwendung*	P M K N S
	$d_1(h_{10})$	$d_2(h_6)$	l_2	l_1	z	Grade	KMG405
5502R453GM-0300	3.00	6	7	57	3		●
5502R453GM-0400	4.00	6	8	57	3		●
5502R453GM-0500	5.00	6	10	57	3		●
5502R453GM-0600	6.00	6	10	57	3		●
5502R453GM-0800	8.00	8	16	63	3		●
5502R453GM-1000	10.00	10	19	72	3		●
5502R453GM-1200	12.00	12	22	83	3		●
5502R453GM-1400	14.00	14	22	83	3		●
5502R453GM-1600	16.00	16	26	92	3		●
5502R453GM-1800	18.00	18	26	92	3		●
5502R453GM-2000	20.00	20	32	104	3		●
					Art. Group No. / *Produktgruppe Nr.* :		**021130**

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

KMG405

Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
✔	✔	✔	✔			✔	✔			✔	✔

● Ex Stock / ab Lager ○ On demand / auf Anfrage

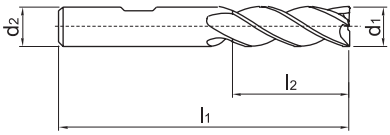
DIN 6527L 3-flute end mills · DIN 6527L 3-Schneiden VHM Schaftfräser



5602R453GM

KMG405: nano TiAlN coated ultra-fine carbide / *nano TiAlN beschichtetes Ultrafeinkornhartmetall*
KMG303: nano TiAlN coated ultra-fine carbide / *nano TiAlN beschichtetes Ultrafeinkornhartmetall*







Type *Typ*	Dimension(mm) *Abmessungen*				Teeth *Zähne*	Application *Anwendung*	P M K N S	
	$d_1(h_{10})$	$d_2(h_6)$	l_2	l_1	z	Grade	KMG303	KMG405
5602R453GM-0300	3.00	6	7	57	3		●	●
5602R453GM-0400	4.00	6	8	57	3		●	●
5602R453GM-0500	5.00	6	10	57	3		●	●
5602R453GM-0600	6.00	6	10	57	3		●	●
5602R453GM-0800	8.00	8	16	63	3		●	●
5602R453GM-1000	10.00	10	19	72	3		●	●
5602R453GM-1200	12.00	12	22	83	3		●	●
5602R453GM-1400	14.00	14	22	83	3		●	●
5602R453GM-1600	16.00	16	26	92	3		●	●
5602R453GM-1800	18.00	18	26	92	3		●	●
5602R453GM-2000	20.00	20	32	104	3		●	●

Art. Group No. / *Produktgruppe Nr.* : 021130

KMG405

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
✔	✔	✔	✔			✔	✔			✔	✔

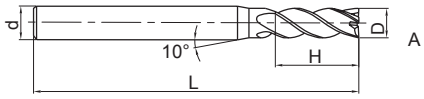
Code key B194/196
ISO Kennzeichen
Cutting data B293-368
Schnittdaten
Graphics identification & application B195/197
Graphische Werkzeug- & Anwendungsbeschr.
Order form for non-standard products B373-B372
Bestellformular für Sonderwerkzeuge

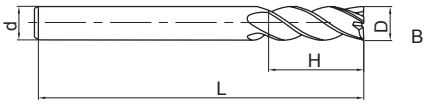
GM-4E series for general machining · GM-4E Serie für allgemeine Bearbeitung

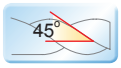
4-flute flattened end mills with straight shank
4-Schneiden Eckfräser mit Zylinderschaft

















Type · Typ	Dimension(mm) Abmessungen				Teeth · Zähne Z	Geometry Ausführung	Grade · Sorte KMG 303
	D	d	H	L			
GM-4E-D1.0S	1.0	4	3	50	4	A	○
GM-4E-D1.5S	1.5	4	4	50	4	A	○
GM-4E-D2.0S	2.0	4	6	50	4	A	○
GM-4E-D2.5S	2.5	4	8	50	4	A	○
GM-4E-D3.0S	3.0	4	8	50	4	A	○
GM-4E-D4.0S	4.0	4	11	50	4	B	○
GM-4E-D1.0	1.0	6	3	50	4	A	○
GM-4E-D1.5	1.5	6	4	50	4	A	○
GM-4E-D2.0	2.0	6	6	50	4	A	○
GM-4E-D2.5	2.5	6	8	50	4	A	○
GM-4E-D3.0	3.0	6	8	50	4	A	○
GM-4E-D3.5	3.5	6	10	50	4	A	○
GM-4E-D4.0	4.0	6	11	50	4	A	○
GM-4E-D4.5	4.5	6	11	50	4	A	○
GM-4E-D5.0	5.0	6	13	50	4	A	○
GM-4E-D5.5	5.5	6	16	50	4	A	○
GM-4E-D6.0	6.0	6	16	50	4	B	○
GM-4E-D7.0	7.0	8	20	60	4	A	○
GM-4E-D8.0	8.0	8	20	60	4	B	○
GM-4E-D9.0	9.0	10	22	75	4	A	○
GM-4E-D10.0	10.0	10	25	75	4	B	○
GM-4E-D11.0	11.0	12	26	75	4	A	○
GM-4E-D12.0	12.0	12	30	75	4	B	○
GM-4E-D14.0	14.0	14	32	75	4	B	○
GM-4E-D16.0	16.0	16	45	100	4	B	○
GM-4E-D18.0	18.0	18	45	100	4	B	○
GM-4E-D20.0	20.0	20	45	100	4	B	○

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

KMG303

Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
✔	✔	✔	✔			✔	✔			✔	✔

● Ex Stock / ab Lager ○ On demand / auf Anfrage

DIN 6527K 4-flute end mills · DIN 6527K 4-Schneiden VHM Schaftfräser

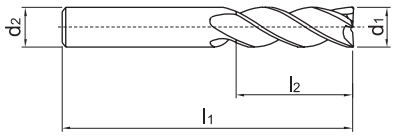


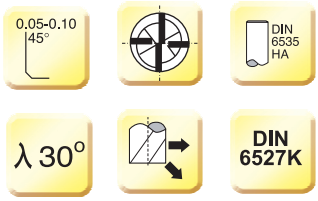
5501R304GF



YK30F: Ultra-fine carbide grade / *Ultrafeinkornhartmetall*
KMG303: nano TiAlN coated ultra-fine carbide / *nano TiAlN beschichtetes Ultrafeinkornhartmetall*







Type *Typ*	Dimension(mm) *Abmessungen*				Teeth *Zähne*	Application *Anwendung*	P M K S	
	$d_1(h_{10})$	$d_2(h_6)$	l_2	l_1	z	Grade	YK30F	KMG303
5501R304GF-0300	3.00	6	5	50	4		○	●
5501R304GF-0400	4.00	6	8	54	4		○	●
5501R304GF-0500	5.00	6	9	54	4		○	●
5501R304GF-0600	6.00	6	10	54	4		○	●
5501R304GF-0800	8.00	8	12	58	4		○	●
5501R304GF-1000	10.00	10	14	66	4		○	●
5501R304GF-1200	12.00	12	16	73	4		○	●
5501R304GF-1400	14.00	14	18	75	4		○	●
5501R304GF-1600	16.00	16	22	82	4		○	●
5501R304GF-1800	18.00	18	24	84	4		○	●
5501R304GF-2000	20.00	20	26	92	4		○	●
						Art. Group No. / *Produktgruppe Nr.* :	**021140**	**021130**

Material Overview · Material Übersicht

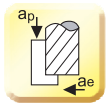
✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

KMG303

Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
✔	✔	✔				✔	✔			✔	✔

Code key B194/196
ISO Kennzeichen
Cutting data B293-368
Schnittdaten
Graphics identification & application B195/197
Graphische Werkzeug- & Anwendungsbeschr.
Order form for non-standard products B373-B372
Bestellformular für Sonderwerkzeuge

DIN 6527K 4-flute end mills · DIN 6527K 4-Schneiden VHM Schaftfräser

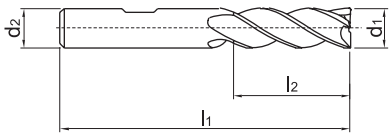


5601R304GF



YK30F: Ultra-fine carbide grade / *Ultrafeinkornhartmetall*
KMG303: nano TiAlN coated ultra-fine carbide / *nano TiAlN beschichtetes Ultrafeinkornhartmetall*







Type *Typ*	Dimension(mm) *Abmessungen*				Teeth *Zähne*	Application *Anwendung*	P M K S	
	$d_1(h_{10})$	$d_2(h_6)$	l_2	l_1	z	Grade	YK30F	KMG303
5601R304GF-0300	3.00	6	5	50	4		○	●
5601R304GF-0400	4.00	6	8	54	4		○	●
5601R304GF-0500	5.00	6	9	54	4		○	●
5601R304GF-0600	6.00	6	10	54	4		○	●
5601R304GF-0800	8.00	8	12	58	4		○	●
5601R304GF-1000	10.00	10	14	66	4		○	●
5601R304GF-1200	12.00	12	16	73	4		○	●
5601R304GF-1400	14.00	14	18	75	4		○	●
5601R304GF-1600	16.00	16	22	82	4		○	●
5601R304GF-1800	18.00	18	24	84	4		○	●
5601R304GF-2000	20.00	20	26	92	4		○	●
						Art. Group No. / *Produktgruppe Nr.* :	**021140**	**021130**

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

KMG303

Workpiece material Werkstückstoff												
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
✔	✔	✔				✔	✔			✔	✔

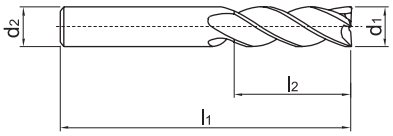
● Ex Stock / ab Lager ○ On demand / auf Anfrage

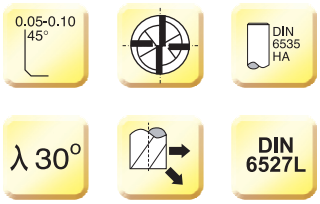
DIN 6527L 4-flute end mills · DIN 6527L 4-Schneiden VHM Schaftfräser

5502R304GF

YK30F: Ultra-fine carbide grade / *Ultrafeinkornhartmetall*
KMG303: nano TiAlN coated ultra-fine carbide / *nano TiAlN beschichtetes Ultrafeinkornhartmetall*







Type *Typ*	Dimension(mm) *Abmessungen*				Teeth *Zähne*	Application *Anwendung*	P M K S	
	$d_1(h_{10})$	$d_2(h_6)$	l_2	l_1	z	Grade	YK30F	KMG303
5502R304GF-0300	3.00	6	8	57	4		○	●
5502R304GF-0400	4.00	6	11	57	4		○	●
5502R304GF-0500	5.00	6	13	57	4		○	●
5502R304GF-0600	6.00	6	13	57	4		○	●
5502R304GF-0800	8.00	8	19	63	4		○	●
5502R304GF-1000	10.00	10	22	72	4		○	●
5502R304GF-1200	12.00	12	26	83	4		○	●
5502R304GF-1400	14.00	14	26	83	4		○	●
5502R304GF-1600	16.00	16	32	92	4		○	●
5502R304GF-1800	18.00	18	32	92	4		○	●
5502R304GF-2000	20.00	20	38	104	4		○	●
						Art. Group No. / *Produktgruppe Nr.* :	**021140**	**021130**

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

KMG303

Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
✔	✔	✔				✔	✔			✔	✔

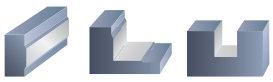
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Cutting data B293-368 Schnittdaten
Graphics identification & application B195/197 Graphische Werkzeug- & Anwendungsbeschr.
Order form for non-standard products B373-B372 Bestellformular für Sonderwerkzeuge

DIN 6527L 4-flute end mills · DIN 6527L 4-Schneiden VHM Schaftfräser

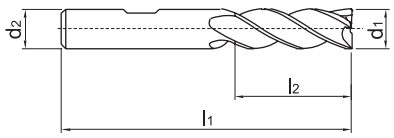


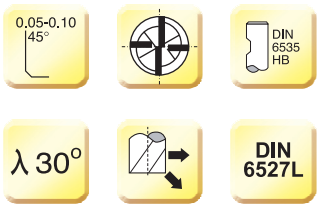
5602R304GF

YK30F: Ultra-fine carbide grade / *Ultrafeinkornhartmetall*
KMG303: nano TiAlN coated ultra-fine carbide / *nano TiAlN beschichtetes Ultrafeinkornhartmetall*









Type *Typ*	Dimension(mm) *Abmessungen*				Teeth *Zähne*	Application *Anwendung*	P M K S	
	$d_1(h_{10})$	$d_2(h_6)$	l_2	l_1	z	Grade	YK30F	KMG303
5602R304GF-0300	3.00	6	8	57	4		○	●
5602R304GF-0400	4.00	6	11	57	4		○	●
5602R304GF-0500	5.00	6	13	57	4		○	●
5602R304GF-0600	6.00	6	13	57	4		○	●
5602R304GF-0800	8.00	8	19	63	4		○	●
5602R304GF-1000	10.00	10	22	72	4		○	●
5602R304GF-1200	12.00	12	26	83	4		○	●
5602R304GF-1400	14.00	14	26	83	4		○	●
5602R304GF-1600	16.00	16	32	92	4		○	●
5602R304GF-1800	18.00	18	32	92	4		○	●
5602R304GF-2000	20.00	20	38	104	4		○	●
						Art. Group No. / *Produktgruppe Nr.* :	**021140**	**021130**

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
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KMG303

Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
✔	✔	✔				✔	✔			✔	✔

● Ex Stock / ab Lager ○ On demand / auf Anfrage

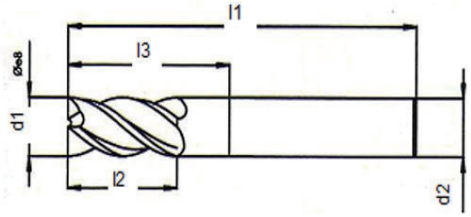
DIN 6527K 4-flute end mills · DIN 6527K 4-Schneiden VHM Schaftfräser

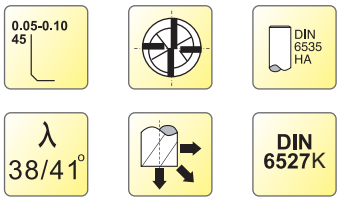
5501R38414GM











Type · Typ	Dimension(mm) Abmessungen				Teeth Zähne	Application Anwendung	P M K S
	$d_1(e_8)$	$d_2(h_6)$	l_1	l_2	z	Grade Sorte	KMG405
5501R38414GM-0400	4	6	54	8	4		●
5501R38414GM-0500	5	6	54	9	4		●
5501R38414GM-0600	6	6	54	10	4		●
5501R38414GM-0800	8	8	58	12	4		●
5501R38414GM-1000	10	10	66	14	4		●
5501R38414GM-1200	12	12	73	16	4		●
5501R38414GM-1400	14	14	75	18	4		●
5501R38414GM-1600	16	16	82	22	4		●
5501R38414GM-1800	18	18	84	24	4		●
5501R38414GM-2000	20	20	92	26	4		●

Art. Group No. / Produktgruppe Nr.: 26

- Unique geometry design with 38°/41° helix angle in optimal combination of top grade, KMG 405.
- Suitable for roughing and finishing of steel, alloy steel and stainless steel.
- Effective milling with higher feed rate and bigger cutting depth.
- Quiet machining without vibration.
- Long tool life and good surface finishing.

- Einzigartige Geometry mit ungleichem Spiralwinkel (38°/41°), in Kombination mit einer hervoragenden Sorte die KMG 405.
- Geeignet zur Schrupp- und Schlichtbearbeitung von Stahl, legiertem Stahl und rostfreiem Stahl.
- Effektive Fräsbearbeitung mit höhren Vorschüben und größeren Schnitttiefen.
- Ruhige Bearbeitung ohne Vibrationen.
- Höhere Standzeit und bessere Oberflächenqualität.

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

KMG405

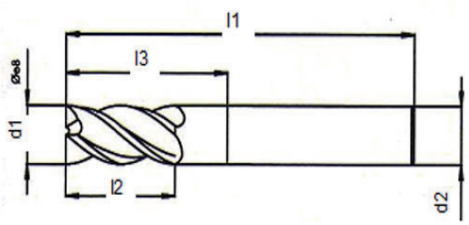
Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
✔	✔	✔	✔			✔	✔			✔	✔

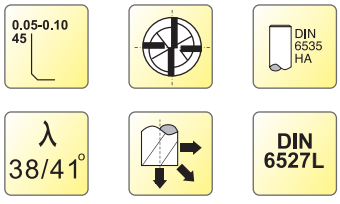
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Graphics identification & application B195/197
Graphische Werkzeug- & Anwendungsbeschr.
Order form for non-standard products B373-B372
Bestellformular für Sonderwerkzeuge

DIN 6527L 4-flute end mills · DIN 6527L 4-Schneiden VHM Schaftfräser

5502R38414GM







Type · Typ	Dimension(mm) Abmessungen				Teeth Zähne	Application Anwendung	P M K S
	$d_1(e_8)$	$d_2(h_6)$	l_1	l_2	z	Grade Sorte	KMG405
5502R38414GM-0400	4	6	57	11	4		●
5502R38414GM-0500	5	6	57	13	4		●
5502R38414GM-0600	6	6	57	13	4		●
5502R38414GM-0800	8	8	63	19	4		●
5502R38414GM-1000	10	10	72	22	4		●
5502R38414GM-1200	12	12	83	26	4		●
5502R38414GM-1400	14	14	83	26	4		●
5502R38414GM-1600	16	16	92	32	4		●
5502R38414GM-1800	18	18	92	32	4		●
5502R38414GM-2000	20	20	104	38	4		●

Art. Group No. / Produktgruppe Nr.: 26

- Unique geometry design with 38°/41° helix angle in optimal combination of top grade, KMG 405.
- Suitable for roughing and finishing of steel, alloy steel and stainless steel.
- Effective milling with higher feed rate and bigger cutting depth.
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- Einzigartige Geometry mit ungleichem Spiralwinkel (38°/41°), in Kombination mit einer hervoragenden Sorte die KMG 405.
- Geeignet zur Schrupp- und Schlichtbearbeitung von Stahl, legiertem Stahl und rostfreiem Stahl.
- Effektive Fräsbearbeitung mit höhren Vorschüben und größeren Schnitttiefen.
- Ruhige Bearbeitung ohne Vibrationen.
- Höhere Standzeit und bessere Oberflächenqualität.

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

KMG405

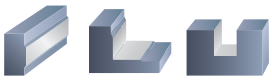
Workpiece material Werkstückstoff												
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
✔	✔	✔	✔			✔	✔			✔	✔

● Ex Stock / ab Lager ○ On demand / auf Anfrage

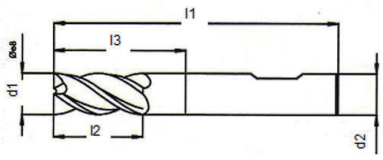
DIN 6527L 4-flute end mills · DIN 6527L 4-Schneiden VHM Schaftfräser

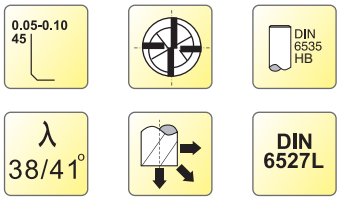
5602R38414GM











Type · Typ	Dimension(mm) Abmessungen				Teeth Zähne	Application Anwendung	P M K S
	$d_1(e_8)$	$d_2(h_6)$	l_1	l_2	z	Grade Sorte	KMG405
5602R38414GM-0400	4	6	57	11	4		●
5602R38414GM-0500	5	6	57	13	4		●
5602R38414GM-0600	6	6	57	13	4		●
5602R38414GM-0800	8	8	63	19	4		●
5602R38414GM-1000	10	10	72	22	4		●
5602R38414GM-1200	12	12	83	26	4		●
5602R38414GM-1400	14	14	83	26	4		●
5602R38414GM-1600	16	16	92	32	4		●
5602R38414GM-1800	18	18	92	32	4		●
5602R38414GM-2000	20	20	104	38	4		●

Art. Group No. / Produktgruppe Nr.: 26

- Unique geometry design with 38°/41° helix angle in optimal combination of top grade, KMG 405.
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- Einzigartige Geometry mit ungleichem Spiralwinkel (38°/41°), in Kombination mit einer hervoragenden Sorte die KMG 405.
- Geeignet zur Schrupp- und Schlichtbearbeitung von Stahl, legiertem Stahl und rostfreiem Stahl.
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- Ruhige Bearbeitung ohne Vibrationen.
- Höhere Standzeit und bessere Oberflächenqualität.

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

KMG405

Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
✔	✔	✔	✔			✔	✔			✔	✔

Code key B194/196 ISO Kennzeichen
Cutting data B293-368 Schnittdaten
Graphics identification & application B195/197 Graphische Werkzeug- & Anwendungsbeschr.
Order form for non-standard products B373-B372 Bestellformular für Sonderwerkzeuge

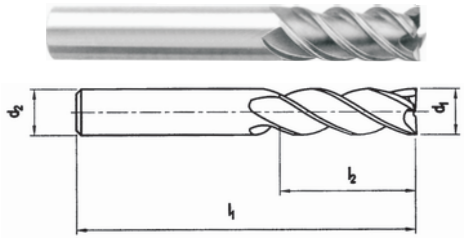
DIN 6528 4-flute end mills · DIN 6528 4-Schneiden VHM Schaftfräser

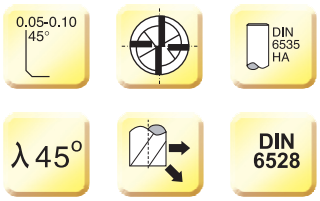


5508R454GM



YK30F: Ultra-fine carbide grade / *Ultrafeinkornhartmetall*
KMG303: nano TiAlN coated ultra-fine carbide / *nano TiAlN beschichtetes Ultrafeinkornhartmetall*





Type *Typ*	Dimension(mm) *Abmessungen*				Teeth *Zähne*	Application *Anwendung*	P M K N S	
	$d_1(h_{10})$	$d_2(h_6)$	l_2	l_1	z	Grade	YK30F	KMG303
5508R454GM-0300	3.00	3	8	45	4		○	●
5508R454GM-0400	4.00	4	11	50	4		○	●
5508R454GM-0500	5.00	5	13	50	4		○	●
5508R454GM-0600	6.00	6	13	57	4		○	●
5508R454GM-0800	8.00	8	19	63	4		○	●
5508R454GM-1000	10.00	10	22	72	4		○	●
5508R454GM-1200	12.00	12	26	83	4		○	●
5508R454GM-1400	14.00	14	26	83	4		○	●
5508R454GM-1600	16.00	16	32	92	4		○	●
5508R454GM-1800	18.00	18	32	92	4		○	●
5508R454GM-2000	20.00	20	38	104	4		○	●
						Art. Group No. / *Produktgruppe Nr.* :	**021140**	**021130**

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

KMG303

Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
✔	✔	✔	✔			✔	✔				

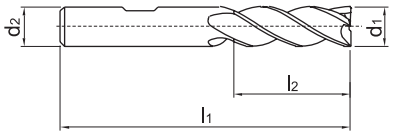
● Ex Stock / ab Lager ○ On demand / auf Anfrage

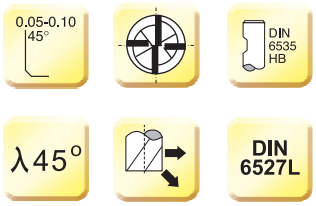
DIN 6527L 4-flute end mills · DIN 6527L 4-Schneiden VHM Schaftfräser

5602R454GM

YK30F: Ultra-fine carbide grade / *Ultrafeinkornhartmetall*
KMG303: nano TiAlN coated ultra-fine carbide / *nano TiAlN beschichtetes Ultrafeinkornhartmetall*







Type *Typ*	Dimension(mm) *Abmessungen*				Teeth *Zähne*	Application *Anwendung*	P M K S
	$d_1(h_{10})$	$d_2(h_6)$	l_2	l_1	z	Grade	KMG303
5602R454GM-0300	3.00	6	8	57	4		●
5602R454GM-0400	4.00	6	11	57	4		●
5602R454GM-0500	5.00	6	13	57	4		●
5602R454GM-0600	6.00	6	13	57	4		●
5602R454GM-0800	8.00	8	19	63	4		●
5602R454GM-1000	10.00	10	22	72	4		●
5602R454GM-1200	12.00	12	26	83	4		●
5602R454GM-1400	14.00	14	26	83	4		●
5602R454GM-1600	16.00	16	32	92	4		●
5602R454GM-1800	18.00	18	32	92	4		●
5602R454GM-2000	20.00	20	38	104	4		●

Art. Group No. / *Produktgruppe Nr.* : 021130

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

KMG303

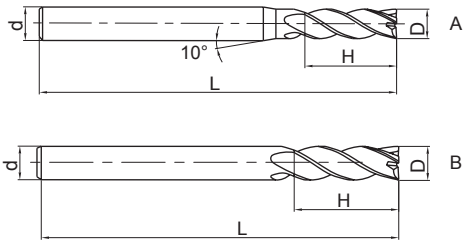
Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
✔	✔	✔	✔			✔	✔				

Code key B194/196 ISO Kennzeichen
Cutting data B293-368 Schnittdaten
Graphics identification & application B195/197 Graphische Werkzeug- & Anwendungsbeschr.
Order form for non-standard products B373-B372 Bestellformular für Sonderwerkzeuge

GM-4EL series for general machining · GM-4EL Serie für allgemeine Bearbeitung

4-flute flattened end mills with straight shank and long cutting edge
4-Schneiden Eckfräser mit langer Schneide und Zylinderschaft





45° | Coated TiAlN | D D≤12 0~-0.020 12<D 0~-0.030

Type · Typ	Dimension(mm) Abmessungen				Teeth · Zähne Z	Geometry Ausführung	Grade · Sorte KMG 303
	D	d	H	L			
GM-4EL-D3.0	3.0	6	12	75	4	A	●
GM-4EL-D4.0	4.0	6	15	75	4	A	●
GM-4EL-D5.0	5.0	6	20	75	4	A	●
GM-4EL-D6.0	6.0	6	20	75	4	B	●
GM-4EL-D8.0	8.0	8	25	100	4	B	●
GM-4EL-D10.0	10.0	10	30	100	4	B	●
GM-4EL-D12.0	12.0	12	35	100	4	B	●
GM-4EL-D14.0	14.0	14	40	100	4	B	●
GM-4EL-D16.0	16.0	16	50	150	4	B	●
GM-4EL-D20.0	20.0	20	55	150	4	B	●

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
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KMG303

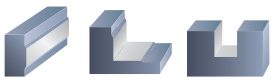
Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
✔	✔	✔	✔			✔	✔			✔	✔

● Ex Stock / ab Lager ○ On demand / auf Anfrage

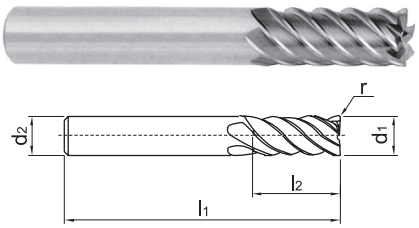
ZCC CT 6-flute slotting end mills (HRC<=50) · ZCC CT 6-Schneiden VHM Langlochfräser (HRC<=50)

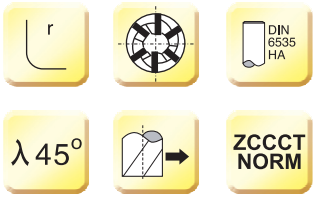


5589R45MGFR



KMG405: nano TiAlN coated ultra-fine carbide / *nano TiAlN beschichtetes Ultrafeinkornhartmetall*





Type *Typ*	Dimension(mm) *Abmessungen*					Teeth *Zähne*	Application *Anwendung*	P K
	$d_1(e_8)$	$d_2(h_6)$	l_2	l_1		z	Grade	KMG405
5589R45MGFR02-0600	6	6	19	63	0.2	6		●
5589R45MGFR02-0800	8	8	28	72	0.2	6		●
5589R45MGFR02-1000	10	10	34	84	0.2	6		●
5589R45MGFR02-1200	12	12	40	97	0.2	6		●
5589R45MGFR03-1600	16	16	48	108	0.3	8		●
5589R45MGFR03-2000	20	20	56	122	0.3	10		●
						Art. Group No. / *Produktgruppe Nr.* :		**021130**

Material Overview · Material Übersicht

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✔ = Suitable · Empfohlen

KMG405

Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
✔	✔	✔	✔			✔	✔				✔

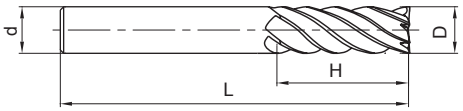
Code key B194/196 ISO Kennzeichen
Cutting data B293-368 Schnittdaten
Graphics identification & application B195/197 Graphische Werkzeug- & Anwendungsbeschr.
Order form for non-standard products B373-B372 Bestellformular für Sonderwerkzeuge

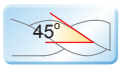
GM-6EL series for general machining · **GM-6EL** Serie für allgemeine Bearbeitung

6-flute end mills with straight shank and long cutting edge
6-Schneiden Eckfräser mit langer Schneide und Zylinderschaft















Type · Typ	Dimension(mm) Abmessungen				Teeth · Zähne Z	Grade · Sorte KMG 303
	D	d	H	L		
GM-6EL-D6.0	6.0	6	24	75	6	○
GM-6EL-D8.0	8.0	8	32	75	6	○
GM-6EL-D10.0	10.0	10	40	100	6	○
GM-6EL-D12.0	12.0	12	45	100	6	○
GM-6EL-D16.0	16.0	16	64	150	6	○
GM-6EL-D20.0	20.0	20	75	150	6	○

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
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KMG303

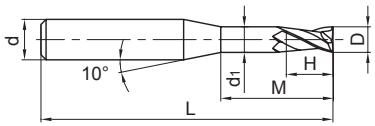
Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
✔	✔	✔	✔			✔	✔			✔	✔

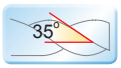
● Ex Stock / ab Lager ○ On demand / auf Anfrage

GM-2EP series for general machining · GM-2EP Serie für allgemeine Bearbeitung

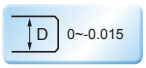
2-flute end mills with straight shank and short cutting edge and long neck
2-Schneiden Eckfräser mit kurzer Schneide und Zylinderschaft











D<1mm



1mm≤D



Type · Typ	Dimension(mm) Abmessungen						Teeth · Zähne Z	Grade Sorte KMG 303
	D	d	H	M	d1	L		
GM-2EP-D0.5-M04	0.5	4.0	0.7	4.0	0.45	50	2	●
GM-2EP-D0.5-M06	0.5	4.0	0.7	6.0	0.45	50	2	●
GM-2EP-D0.5-M08	0.5	4.0	0.7	8.0	0.45	50	2	●
GM-2EP-D0.8-M04	0.8	4.0	1.2	4.0	0.75	50	2	●
GM-2EP-D0.8-M06	0.8	4.0	1.2	6.0	0.75	50	2	●
GM-2EP-D0.8-M08	0.8	4.0	1.2	8.0	0.75	50	2	●
GM-2EP-D0.8-M10	0.8	4.0	1.2	10.0	0.75	50	2	●
GM-2EP-D1.0-M04	1.0	4.0	1.5	4.0	0.95	50	2	●
GM-2EP-D1.0-M06	1.0	4.0	1.5	6.0	0.95	50	2	●
GM-2EP-D1.0-M08	1.0	4.0	1.5	8.0	0.95	50	2	●
GM-2EP-D1.0-M10	1.0	4.0	1.5	10.0	0.95	50	2	●
GM-2EP-D1.0-M12	1.0	4.0	1.5	12.0	0.95	50	2	●
GM-2EP-D1.0-M14	1.0	4.0	1.5	14.0	0.95	50	2	●
GM-2EP-D1.2-M06	1.2	4.0	1.8	6.0	1.15	50	2	●
GM-2EP-D1.2-M08	1.2	4.0	1.8	8.0	1.15	50	2	●
GM-2EP-D1.2-M10	1.2	4.0	1.8	10.0	1.15	50	2	●
GM-2EP-D1.2-M12	1.2	4.0	1.8	12.0	1.15	50	2	○
GM-2EP-D1.5-M06	1.5	4.0	2.3	6.0	1.45	50	2	●
GM-2EP-D1.5-M08	1.5	4.0	2.3	8.0	1.45	50	2	●
GM-2EP-D1.5-M10	1.5	4.0	2.3	10.0	1.45	50	2	●
GM-2EP-D1.5-M12	1.5	4.0	2.3	12.0	1.45	50	2	●
GM-2EP-D1.5-M14	1.5	4.0	2.3	14.0	1.45	50	2	●
GM-2EP-D2.0-M06	2.0	4.0	3.0	6.0	1.95	50	2	●
GM-2EP-D2.0-M08	2.0	4.0	3.0	8.0	1.95	50	2	●

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
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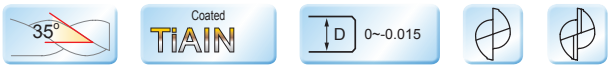
Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
✔	✔	✔				✔	✔				✔

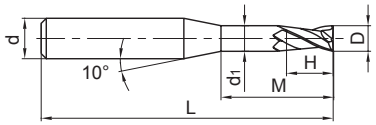
Code key B194/196
ISO Kennzeichen
Cutting data B293-368
Schnittdaten
Graphics identification & application B195/197
Graphische Werkzeug- & Anwendungsbeschr.
Order form for non-standard products B373-B372
Bestellformular für Sonderwerkzeuge

GM-2EP series for general machining · GM-2EP Serie für allgemeine Bearbeitung

2-flute end mills with straight shank and short cutting edge and long neck
2-Schneiden Eckfräser mit kurzer Schneide und Zylinderschaft







Type · Typ	Dimension(mm) Abmessungen						Teeth · Zähne Z	Grade Sorte KMG 303
	D	d	H	M	d_1	L		
GM-2EP-D2.0-M10	2.0	4.0	3.0	10.0	1.95	50	2	●
GM-2EP-D2.0-M12	2.0	4.0	3.0	12.0	1.95	50	2	●
GM-2EP-D2.0-M14	2.0	4.0	3.0	14.0	1.95	50	2	●
GM-2EP-D2.0-M16	2.0	4.0	3.0	16.0	1.95	50	2	●
GM-2EP-D2.5-M08	2.5	4.0	3.7	8.0	2.4	50	2	●
GM-2EP-D2.5-M10	2.5	4.0	3.7	10.0	2.4	50	2	●
GM-2EP-D2.5-M12	2.5	4.0	3.7	12.0	2.4	50	2	●
GM-2EP-D2.5-M14	2.5	4.0	3.7	14.0	2.4	50	2	●
GM-2EP-D2.5-M16	2.5	4.0	3.7	16.0	2.4	60	2	●
GM-2EP-D2.5-M18	2.5	4.0	3.7	18.0	2.4	60	2	●
GM-2EP-D2.5-M20	2.5	4.0	3.7	20.0	2.4	60	2	●
GM-2EP-D3.0-M06	3.0	6.0	4.5	6.0	2.85	50	2	●
GM-2EP-D3.0-M08	3.0	6.0	4.5	8.0	2.85	50	2	●
GM-2EP-D3.0-M10	3.0	6.0	4.5	10.0	2.85	50	2	●
GM-2EP-D3.0-M12	3.0	6.0	4.5	12.0	2.85	50	2	●
GM-2EP-D3.0-M14	3.0	6.0	4.5	14.0	2.85	60	2	●
GM-2EP-D3.0-M16	3.0	6.0	4.5	16.0	2.85	60	2	●
GM-2EP-D3.0-M18	3.0	6.0	4.5	18.0	2.85	60	2	●
GM-2EP-D3.0-M20	3.0	6.0	4.5	20.0	2.85	60	2	●
GM-2EP-D4.0-M12	4.0	6.0	6.0	12.0	3.85	50	2	●
GM-2EP-D4.0-M16	4.0	6.0	6.0	16.0	3.85	60	2	●
GM-2EP-D4.0-M20	4.0	6.0	6.0	20.0	3.85	60	2	●
GM-2EP-D4.0-M25	4.0	6.0	6.0	25.0	3.85	60	2	●
GM-2EP-D5.0-M16	5.0	6.0	7.5	16.0	4.85	60	2	●
GM-2EP-D5.0-M25	5.0	6.0	7.5	25.0	4.85	70	2	●

Material Overview · Material Übersicht

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✔ = Suitable · Empfohlen

KMG303

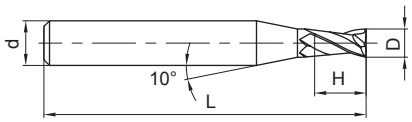
Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
✔	✔	✔				✔	✔			✔	✔

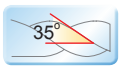
● Ex Stock / ab Lager ○ On demand / auf Anfrage

GM-2ES series for general machining · GM-2ES Serie für allgemeine Bearbeitung

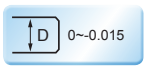
2-flute micro end mills with straight shank
2-Schneiden Mirco Eckfräser mit langer Schneide

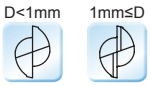












Type · Typ	Dimension(mm) Abmessungen				Teeth · Zähne Z	Grade Sorte KMG303
	D	d	H	L		
GM-2ES-D0.3	0.3	4.0	0.6	50	2	●
GM-2ES-D0.4	0.4	4.0	0.8	50	2	●
GM-2ES-D0.5	0.5	4.0	1.0	50	2	●
GM-2ES-D0.6	0.6	4.0	1.2	50	2	●
GM-2ES-D0.7	0.7	4.0	1.4	50	2	●
GM-2ES-D0.8	0.8	4.0	1.6	50	2	●
GM-2ES-D0.9	0.9	4.0	1.8	50	2	●
GM-2ES-D1.0	1.0	4.0	2.0	50	2	●
GM-2ES-D1.1	1.1	4.0	2.0	50	2	●
GM-2ES-D1.2	1.2	4.0	2.5	50	2	●
GM-2ES-D1.3	1.3	4.0	2.5	50	2	●
GM-2ES-D1.4	1.4	4.0	3.0	50	2	●
GM-2ES-D1.5	1.5	4.0	3.0	50	2	●
GM-2ES-D1.6	1.6	4.0	3.5	50	2	●
GM-2ES-D1.7	1.7	4.0	3.5	50	2	●
GM-2ES-D1.8	1.8	4.0	4.0	50	2	●
GM-2ES-D1.9	1.9	4.0	4.0	50	2	●
GM-2ES-D2.0	2.0	4.0	4.0	50	2	●
GM-2ES-D2.1	2.1	4.0	4.0	50	2	●
GM-2ES-D2.2	2.2	4.0	4.5	50	2	●
GM-2ES-D2.3	2.3	4.0	4.5	50	2	●
GM-2ES-D2.4	2.4	4.0	5.0	50	2	●
GM-2ES-D2.5	2.5	4.0	5.0	50	2	●
GM-2ES-D2.6	2.6	4.0	5.0	50	2	●
GM-2ES-D2.7	2.7	4.0	5.5	50	2	●
GM-2ES-D2.8	2.8	4.0	5.5	50	2	●
GM-2ES-D2.9	2.9	4.0	6.0	50	2	●
GM-2ES-D3.0	3.0	4.0	6.0	50	2	●

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

KMG303

Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
✔	✔	✔				✔	✔			✔	✔

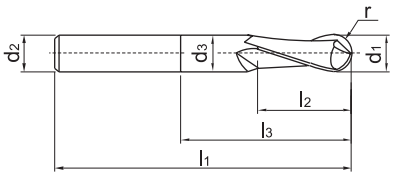
Code key B194/196
ISO Kennzeichen
Cutting data B293-368
Schnittdaten
Graphics identification & application B195/197
Graphische Werkzeug- & Anwendungsbeschr.
Order form for non-standard products B373-B372
Bestellformular für Sonderwerkzeuge

ZCC CT 2-flute ball nose end mills · ZCC CT 2-Schneiden VHM Kugelkopffräser

5565R302GF

KMG303: nano TiAlN coated ultra-fine carbide / *nano TiAlN beschichtetes Ultrafeinkornhartmetall*





DIN 6535 HA

λ 30°

ZCCCT NORM

Type *Typ*	Dimension(mm) *Abmessungen*								Teeth *Zähne*	Application *Anwendung*	P K
	d_1	$d_2(h_6)$	l_2	l_1	d_3	l_3	$r(f_8)$	α°	z	Grade	KMG303
5565R302GF-0300	3.00	6	4	57	2.80	9	1.50	6	2		●
5565R302GF-0400	4.00	6	5	57	3.70	12	2.00	4	2		●
5565R302GF-0500	5.00	6	6	57	4.60	15	2.50	2	2		●
5565R302GF-0600	6.00	6	7	57	5.50	20	3.00		2		●
5565R302GF-0800	8.00	8	9	63	7.40	26	4.00		2		●
5565R302GF-1000	10.00	10	11	72	9.20	31	5.00		2		●
5565R302GF-1200	12.00	12	12	83	11.00	37	6.00		2		●
5565R302GF-1600	16.00	16	16	92	15.00	43	8.00		2		●
5565R302GF-2000	20.00	20	20	104	19.00	50	10.00		2		●

Art. Group No. / *Produktgruppe Nr.* : 021130

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

KMG303

Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
✔	✔	✔	✔				✔				

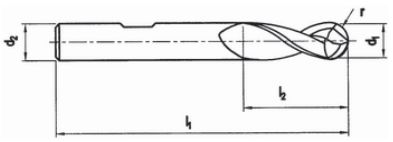
● Ex Stock / ab Lager ○ On demand / auf Anfrage

ZCC CT 2-flute ball nose end mills · ZCC CT 2-Schneiden VHM Kugelkopffräser

5665R202GM

KMG303: nano TiAlN coated ultra-fine carbide / *nano TiAlN beschichtetes Ultrafeinkornhartmetall*





DIN 6535 HB

λ 20°

ZCCCT NORM

Type *Typ*	Dimension(mm) *Abmessungen*								Teeth *Zähne*	Application *Anwendung*	P K
	d_1	$d_2(h_6)$	l_2	l_1	d_3	l_3	r	α°	z	Grade	KMG303
5665R202GM-0300	3.00	6	4	57	2.80	9	1.50	7	2		●
5665R202GM-0400	4.00	6	5	57	3.70	12	2.00	5	2		●
5665R202GM-0500	5.00	6	6	57	4.60	15	2.50	3	2		●
5665R202GM-0600	6.00	6	7	57	5.50	20	3.00		2		●
5665R202GM-0800	8.00	8	9	63	7.40	26	4.00		2		●
5665R202GM-1000	10.00	10	11	72	9.20	31	5.00		2		●
5665R202GM-1200	12.00	12	12	83	11.00	37	6.00		2		●
5665R202GM-1600	16.00	16	16	92	15.00	43	8.00		2		●
5665R202GM-2000	20.00	20	20	104	19.00	50	10.00		2		●

Art. Group No. / *Produktgruppe Nr.* : 021130

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

KMG303

Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
✔	✔	✔	✔				✔				

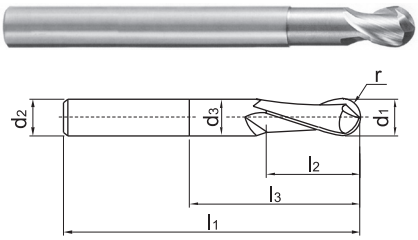
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Cutting data B293-368 Schnittdaten
Graphics identification & application B195/197 Graphische Werkzeug- & Anwendungsbeschr.
Order form for non-standard products B373-B372 Bestellformular für Sonderwerkzeuge

ZCC CT 2-flute ball nose end mills (long) · ZCC CT 2-Schneiden VHM Kugelkopffräser (Lang)



5566R302GF

KMG303: nano TiAlN coated ultra-fine carbide */ nano TiAlN beschichtetes Ultrafeinkornhartmetall*





Type *Typ*	Dimension(mm) *Abmessungen*								Teeth *Zähne*	Application *Anwendung*	P M K
	d_1	$d_2(h_6)$	l_2	l_1	d_3	l_3	$r(f_8)$	α°	z	Grade	KMG303
5566R302GF-0300	3.00	6	4	75	2.80	9	1.50		2		●
5566R302GF-0400	4.00	6	5	75	3.70	12	2.00		2		●
5566R302GF-0500	5.00	6	6	80	4.60	15	2.50		2		●
5566R302GF-0600	6.00	6	7	80	5.50	20	3.00		2		●
5566R302GF-0800	8.00	8	9	90	7.40	26	4.00		2		●
5566R302GF-1000	10.00	10	11	100	9.20	31	5.00		2		●
5566R302GF-1200	12.00	12	12	120	11.00	37	6.00		2		●

Art. Group No. / *Produktgruppe Nr.* : **021130**

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

KMG303

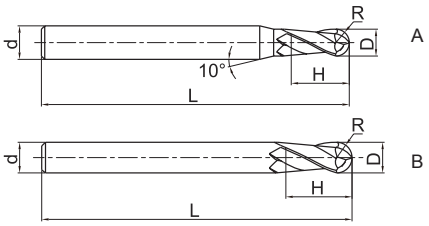
Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
✔	✔	✔	✔			✔	✔				

● Ex Stock / ab Lager ○ On demand / auf Anfrage

GM-2BL series for general machining · GM-2BL Serie für allgemeine Bearbeitung

2-flute ball nose end mills with long straight shank
2-Schneiden Kugelkopffräser mit Zylinderschaft





35° | Coated TiAlN | D D≤12 0~-0.020 12<D 0~-0.030 | R R±0.01

Type · Typ	Dimension(mm) Abmessungen					Teeth · Zähne Z	Geometry Ausführung	Grade Sorte KMG 303
	D	R	d	H	L			
GM-2BL-R1.0	2.0	1.0	6.0	4.0	75	2	A	●
GM-2BL-R1.25	2.5	1.25	6.0	5.0	75	2	A	●
GM-2BL-R1.5	3.0	1.5	6.0	6.0	75	2	A	●
GM-2BL-R1.75	3.5	1.75	6.0	8.0	75	2	A	●
GM-2BL-R2.0	4.0	2.0	6.0	8.0	75	2	A	●
GM-2BL-R2.5	5.0	2.5	6.0	10.0	75	2	A	●
GM-2BL-R2.75	5.5	2.75	6.0	12.0	75	2	A	●
GM-2BL-R3.0	6.0	3.0	6.0	12.0	75	2	B	●
GM-2BL-R3.5	7.0	3.5	8.0	14.0	75	2	A	●
GM-2BL-R4.0	8.0	4.0	8.0	16.0	100	2	B	●
GM-2BL-R4.5	9.0	4.5	10.0	18.0	100	2	A	●
GM-2BL-R5.0	10.0	5.0	10.0	20.0	100	2	B	●
GM-2BL-R6.0	12.0	6.0	12.0	24.0	100	2	B	●
GM-2BL-R7.0	14.0	7.0	14.0	28.0	100	2	B	●
GM-2BL-R8.0	16.0	8.0	16.0	32.0	150	2	B	●
GM-2BL-R10.0	20.0	10.0	20.0	40.0	150	2	B	●

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

KMG303

Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
✔	✔	✔	✔			✔	✔				

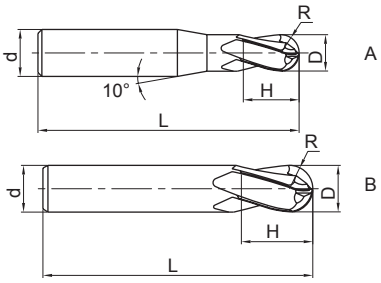
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Cutting data B293-368 Schnittdaten
Graphics identification & application B195/197 Graphische Werkzeug- & Anwendungsbeschr.
Order form for non-standard products B373-B372 Bestellformular für Sonderwerkzeuge

GM-4B series for general machining · GM-4B Serie für allgemeine Bearbeitung

4-flute ball nose end mills with straight shank
4-Schneiden Kugelkopffräser mit Zylinderschaft









Type · Typ	Dimension(mm) Abmessungen					Teeth · Zähne Z	Geometry Ausführung	Grade Sorte KMG 303
	D	R	d	H	L			
GM-4B-R1.5	3.0	1.5	6.0	6.0	50	4	A	●
GM-4B-R2.0	4.0	2.0	6.0	8.0	50	4	A	●
GM-4B-R2.5	5.0	2.5	6.0	10.0	50	4	A	●
GM-4B-R3.0	6.0	3.0	6.0	12.0	50	4	B	●
GM-4B-R4.0	8.0	4.0	8.0	16.0	60	4	B	●
GM-4B-R5.0	10.0	5.0	10.0	20.0	75	4	B	●
GM-4B-R6.0	12.0	6.0	12.0	24.0	75	4	B	●
GM-4B-R7.0	14.0	7.0	14.0	28.0	75	4	B	●
GM-4B-R8.0	16.0	8.0	16.0	32.0	100	4	B	●
GM-4B-R9.0	18.0	9.0	18.0	36.0	100	4	B	●
GM-4B-R10.0	20.0	10.0	20.0	40.0	100	4	B	●

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

KMG303

Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
✔	✔	✔	✔			✔	✔			✔	✔

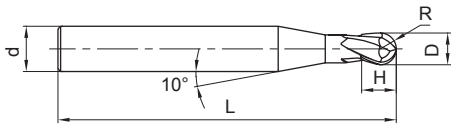
● Ex Stock / ab Lager ○ On demand / auf Anfrage

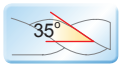
GM-2BS series for general machining · GM-2BS Serie für allgemeine Bearbeitung

2-flute tiny ball nose end mills with straight shank
2-Schneiden Micro-Kugelkopffräser mit Zylinderschaft



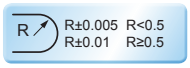














Type · Typ	Dimension(mm) Abmessungen					Teeth · Zähne Z	Grade · Sorte KMG 303
	D	R	d	H	L		
GM-2BS-R0.15	0.30	0.15	4.0	0.5	50	2	●
GM-2BS-R0.20	0.40	0.20	4.0	0.6	50	2	●
GM-2BS-R0.25	0.50	0.25	4.0	0.8	50	2	●
GM-2BS-R0.30	0.60	0.30	4.0	0.9	50	2	●
GM-2BS-R0.35	0.70	0.35	4.0	1.0	50	2	●
GM-2BS-R0.40	0.80	0.40	4.0	1.2	50	2	●
GM-2BS-R0.45	0.90	0.45	4.0	1.3	50	2	●
GM-2BS-R0.50	1.00	0.50	4.0	1.5	50	2	●
GM-2BS-R0.60	1.20	0.60	4.0	1.8	50	2	●
GM-2BS-R0.70	1.40	0.70	4.0	2.0	50	2	●
GM-2BS-R0.75	1.50	0.75	4.0	2.3	50	2	●
GM-2BS-R0.80	1.60	0.80	4.0	2.5	50	2	●
GM-2BS-R0.90	1.80	0.90	4.0	2.7	50	2	●
GM-2BS-R1.00	2.00	1.00	4.0	3.0	50	2	●
GM-2BS-R1.25	2.50	1.25	4.0	3.7	50	2	●
GM-2BS-R1.50	3.00	1.50	4.0	4.5	50	2	●

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

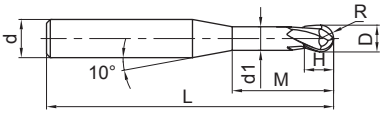
Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
✔	✔	✔				✔	✔			✔	✔

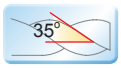
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Order form for non-standard products B373-B372
Bestellformular für Sonderwerkzeuge

GM-2BP series for general machining · GM-2BP Serie für allgemeine Bearbeitung

2-flute ball nose end mills with short cutting edge and long neck
2-Schneiden Kugelkopffräser mit einer kurzen Schneide und Zylinderschaft

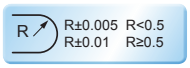














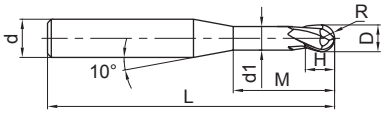
Type · Typ	Dimension(mm) Abmessungen							Teeth Zähne Z	Grade Sorte KMG 303
	D	R	H	d_1	M	d	L		
GM-2BP-R0.25-M04	0.5	0.25	0.7	0.45	4.0	4.0	50	2	●
GM-2BP-R0.25-M06	0.5	0.25	0.7	0.45	6.0	4.0	50	2	●
GM-2BP-R0.3-M04	0.6	0.3	0.9	0.55	4.0	4.0	50	2	●
GM-2BP-R0.3-M06	0.6	0.3	0.9	0.55	6.0	4.0	50	2	●
GM-2BP-R0.3-M08	0.6	0.3	0.9	0.55	8.0	4.0	50	2	●
GM-2BP-R0.4-M04	0.8	0.4	1.2	0.75	4.0	4.0	50	2	●
GM-2BP-R0.4-M06	0.8	0.4	1.2	0.75	6.0	4.0	50	2	●
GM-2BP-R0.4-M08	0.8	0.4	1.2	0.75	8.0	4.0	50	2	●
GM-2BP-R0.4-M10	0.8	0.4	1.2	0.75	10.0	4.0	50	2	●
GM-2BP-R0.5-M04	1.0	0.5	1.5	0.95	4.0	4.0	50	2	●
GM-2BP-R0.5-M06	1.0	0.5	1.5	0.95	6.0	4.0	50	2	●
GM-2BP-R0.5-M08	1.0	0.5	1.5	0.95	8.0	4.0	50	2	●
GM-2BP-R0.5-M10	1.0	0.5	1.5	0.95	10.0	4.0	50	2	●
GM-2BP-R0.5-M12	1.0	0.5	1.5	0.95	12.0	4.0	50	2	●
GM-2BP-R0.6-M06	1.2	0.6	1.8	1.15	6.0	4.0	50	2	●
GM-2BP-R0.6-M08	1.2	0.6	1.8	1.15	8.0	4.0	50	2	●
GM-2BP-R0.6-M12	1.2	0.6	1.8	1.15	12.0	4.0	50	2	●
GM-2BP-R0.6-M16	1.2	0.6	1.8	1.15	16.0	4.0	50	2	●
GM-2BP-R0.75-M08	1.5	0.75	2.3	1.45	8.0	4.0	50	2	●
GM-2BP-R0.75-M12	1.5	0.75	2.3	1.45	12.0	4.0	50	2	●
GM-2BP-R0.75-M16	1.5	0.75	2.3	1.45	16.0	4.0	50	2	●
GM-2BP-R1.0-M06	2.0	1.0	3.0	1.95	6.0	4.0	50	2	●
GM-2BP-R1.0-M08	2.0	1.0	3.0	1.95	8.0	4.0	50	2	●
GM-2BP-R1.0-M10	2.0	1.0	3.0	1.95	10.0	4.0	50	2	●
GM-2BP-R1.0-M12	2.0	1.0	3.0	1.95	12.0	4.0	50	2	●
GM-2BP-R1.0-M16	2.0	1.0	3.0	1.95	16.0	4.0	50	2	●
GM-2BP-R1.0-M20	2.0	1.0	3.0	1.95	20.0	4.0	50	2	●
GM-2BP-R1.25-M08	2.5	1.25	3.7	2.4	8.0	4.0	50	2	●
GM-2BP-R1.25-M12	2.5	1.25	3.7	2.4	12.0	4.0	50	2	●
GM-2BP-R1.25-M16	2.5	1.25	3.7	2.4	16.0	4.0	60	2	●
GM-2BP-R1.25-M20	2.5	1.25	3.7	2.4	20.0	4.0	60	2	●

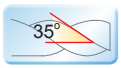
● Ex Stock / ab Lager ○ On demand / auf Anfrage

GM-2BP series for general machining · GM-2BP Serie für allgemeine Bearbeitung

2-flute straight shank ball nose end mills with short cutting edge and long neck
2-Schneiden Kugelkopffräser mit kurzer Schneide und Zylinderschaft















Type · Typ	Dimension(mm) Abmessungen							Teeth · Zähne Z	Grade Sorte KMG 303
	D	R	H	d_1	M	d	L		
GM-2BP-R1.5-M08	3.0	1.5	4.5	2.85	8.0	6.0	50	2	●
GM-2BP-R1.5-M10	3.0	1.5	4.5	2.85	10.0	6.0	50	2	●
GM-2BP-R1.5-M12	3.0	1.5	4.5	2.85	12.0	6.0	50	2	●
GM-2BP-R1.5-M16	3.0	1.5	4.5	2.85	16.0	6.0	60	2	●
GM-2BP-R1.5-M20	3.0	1.5	4.5	2.85	20.0	6.0	60	2	●
GM-2BP-R2.0-M10	4.0	2.0	6.0	3.85	10.0	6.0	60	2	●
GM-2BP-R2.0-M16	4.0	2.0	6.0	3.85	16.0	6.0	60	2	●
GM-2BP-R2.0-M20	4.0	2.0	6.0	3.85	20.0	6.0	60	2	●
GM-2BP-R2.0-M25	4.0	2.0	6.0	3.85	25.0	6.0	60	2	●
GM-2BP-R2.5-M16	5.0	2.5	7.5	4.85	16.0	6.0	60	2	●
GM-2BP-R2.5-M25	5.0	2.5	7.5	4.85	25.0	6.0	70	2	●

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

KMG303

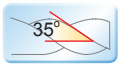
Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
✔	✔	✔				✔	✔			✔	✔

Code key B194/196
ISO Kennzeichen
Cutting data B293-368
Schnittdaten
Graphics identification & application B195/197
Graphische Werkzeug- & Anwendungsbeschr.
Order form for non-standard products B373-B372
Bestellformular für Sonderwerkzeuge

GM-2R series for general machining · GM-2R Serie für allgemeine Bearbeitung

2-flute radius end mills with straight shank
2-Schneiden Radius Schaftfräser und Zylinderschaft

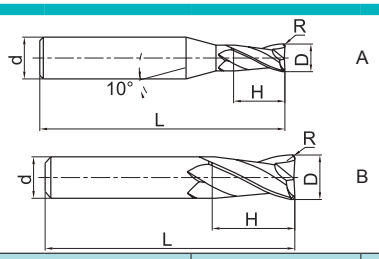












Type · Typ	Dimension(mm) Abmessungen					Teeth · ZähneZ	Grade Sorte KMG 303
	D	R	d	H	L		
GM-2R-D1.0R0.2	1.0	0.2	4	3	50	2	○
GM-2R-D1.5R0.2	1.5	0.2	4	4	50	2	○
GM-2R-D2.0R0.2	2.0	0.2	4	6	50	2	○
GM-2R-D2.0R0.5	2.0	0.5	4	6	50	2	○
GM-2R-D2.5R0.2	2.5	0.2	4	8	50	2	○
GM-2R-D2.5R0.5	2.5	0.5	4	8	50	2	○
GM-2R-D3.0R0.2	3.0	0.2	4	8	50	2	○
GM-2R-D3.0R0.3	3.0	0.3	4	8	50	2	○
GM-2R-D3.0R0.5	3.0	0.5	4	8	50	2	○
GM-2R-D4.0R0.2	4.0	0.2	4	11	50	2	○
GM-2R-D4.0R0.3	4.0	0.3	4	11	50	2	○
GM-2R-D4.0R0.5	4.0	0.5	4	11	50	2	○
GM-2R-D4.0R1.0	4.0	1.0	4	11	50	2	○
GM-2R-D5.0R0.3	5.0	0.3	6	13	50	2	○
GM-2R-D5.0R0.5	5.0	0.5	6	13	50	2	○
GM-2R-D5.0R1.0	5.0	1.0	6	13	50	2	○
GM-2R-D6.0R0.3	6.0	0.3	6	16	50	2	○
GM-2R-D6.0R0.5	6.0	0.5	6	16	50	2	○
GM-2R-D6.0R1.0	6.0	1.0	6	16	50	2	○
GM-2R-D8.0R0.3	8.0	0.3	8	20	60	2	○
GM-2R-D8.0R0.5	8.0	0.5	8	20	60	2	○
GM-2R-D8.0R1.0	8.0	1.0	8	20	60	2	○
GM-2R-D10.0R0.5	10.0	0.5	10	25	75	2	○
GM-2R-D10.0R1.0	10.0	1.0	10	25	75	2	○
GM-2R-D10.0R1.5	10.0	1.5	10	25	75	2	○
GM-2R-D10.0R2.0	10.0	2.0	10	25	75	2	○
GM-2R-D12.0R0.5	12.0	0.5	12	30	75	2	○
GM-2R-D12.0R1.0	12.0	1.0	12	30	75	2	○
GM-2R-D12.0R1.5	12.0	1.5	12	30	75	2	○
GM-2R-D12.0R2.0	12.0	2.0	12	30	75	2	○

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
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KMG303

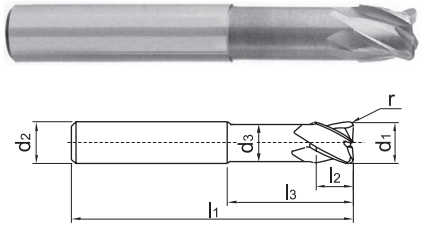
Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
✔	✔	✔	✔			✔	✔			✔	✔

● Ex Stock / ab Lager ○ On demand / auf Anfrage

ZCC CT 4-flute end mills (HRC<56)
ZCC CT 4-Schneiden VHM Gesenkfräser mit Eckenradius (HRC<56)

5585R304GHR

KMG405: nano AlTiN Coated Untra-fine carbide / *nano AlTiN beschichtetes Ultrafeinkornhartmetall*



r | DIN 6535 HA | λ 30° | ZCCCT NORM

Type *Typ*	Dimension(mm) *Abmessungen*							Teeth *Zähne*	Application *Anwendung*	P K H
	$d_1(e_8)$	$d_2(h_6)$	l_2	l_1	d_3	l_3	$r_{(+0.03)}$	z	Grade	KMG405
5585R304GHR03-0600	6.00	6	7	57	5.50	20	0.30	4		●
5585R304GHR15-0600	6.00	6	7	57	5.50	20	1.50	4		●
5585R304GHR03-0800	8.00	8	9	63	7.40	26	0.30	4		●
5585R304GHR20-0800	8.00	8	9	63	7.40	26	2.00	4		●
5585R304GHR05-1000	10.00	10	11	72	9.20	31	0.50	4		●
5585R304GHR25-1000	10.00	10	11	72	9.20	31	2.50	4		●
5585R304GHR05-1200	12.00	12	12	83	11.00	37	0.50	4		●
5585R304GHR30-1200	12.00	12	12	83	11.00	37	3.00	4		●
5585R304GHR10-1600	16.00	16	16	92	15.00	43	1.00	4		●
5585R304GHR40-1600	16.00	16	16	92	15.00	43	4.00	4		●

Art. Group No. / *Produktgruppe Nr.* : 025130

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
✔	✔	✔	✔	✔		✔	✔				

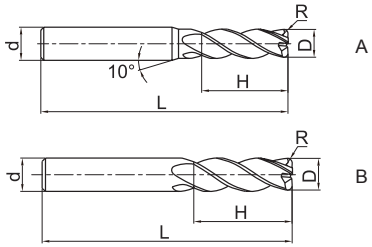
Code key B194/196 ISO Kennzeichen
Cutting data B293-368 Schnittdaten
Graphics identification & application B195/197 Graphische Werkzeug- & Anwendungsbeschr.
Order form for non-standard products B373-B372 Bestellformular für Sonderwerkzeuge

GM-4R series for general machining · **GM-4R** Serie für allgemeine Bearbeitung

4-flute radius end mills with straight shank
4-Schneiden Radius-Schaftfräser und Zylinderschaft







Type · Typ	Dimension(mm) Abmessungen					Teeth · Zähne Z	Geometry Ausführung	Grade Sorte KMG 303
	D	R	d	H	L			
GM-4R-D3.0R0.2	3.0	0.2	4	8	50	4	A	●
GM-4R-D4.0R0.3	4.0	0.3	4	10	50	4	B	●
GM-4R-D4.0R0.5	4.0	0.5	4	10	50	4	B	●
GM-4R-D5.0R0.5	5.0	0.5	6	13	50	4	A	●
GM-4R-D5.0R1.0	5.0	1.0	6	13	50	4	A	●
GM-4R-D6.0R0.5	6.0	0.5	6	16	50	4	B	●
GM-4R-D6.0R1.0	6.0	1.0	6	16	50	4	B	●
GM-4R-D8.0R0.5	8.0	0.5	8	20	60	4	B	●
GM-4R-D8.0R1.0	8.0	1.0	8	20	60	4	B	●
GM-4R-D10.0R0.5	10.0	0.5	10	25	75	4	B	●
GM-4R-D10.0R1.0	10.0	1.0	10	25	75	4	B	●
GM-4R-D10.0R2.0	10.0	2.0	10	25	75	4	B	●
GM-4R-D10.0R3.0	10.0	3.0	10	25	75	4	B	●
GM-4R-D12.0R0.5	12.0	0.5	12	30	75	4	B	●
GM-4R-D12.0R1.0	12.0	1.0	12	30	75	4	B	●
GM-4R-D12.0R2.0	12.0	2.0	12	30	75	4	B	●
GM-4R-D12.0R3.0	12.0	3.0	12	30	75	4	B	●

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
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KMG303

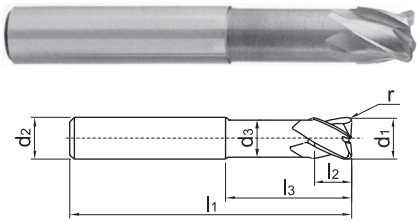
Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
✔	✔	✔	✔			✔	✔			✔	✔

● Ex Stock / ab Lager ○ On demand / auf Anfrage

ZCC CT 4-flute radius-end mills (HRC<56)
ZCC CT 4-Schneiden VHM Gesenkfräser mit Eckenradius (HRC<56)

5586R304GHR

KMG405: nano AlTiN Coated Untra-fine carbide / *nano AlTiN beschichtetes Ultrafeinkornhartmetall*



Type *Typ*	Dimension(mm) *Abmessungen*							Teeth *Zähne*	Application *Anwendung*	P K H
	$d_1(e_8)$	$d_2(h_6)$	l_2	l_1	d_3	l_3	$r_{(+0.03)}$	z	Grade	KMG405
5586R304GHR03-0600	6.00	6	7	80	5.50	43	0.30	4		●
5586R304GHR15-0600	6.00	6	7	80	5.50	43	1.50	4		●
5586R304GHR03-0800	8.00	8	9	90	7.40	53	0.30	4		●
5586R304GHR20-0800	8.00	8	9	90	7.40	53	2.00	4		●
5586R304GHR05-1000	10.00	10	11	100	9.20	59	0.50	4		●
5586R304GHR25-1000	10.00	10	11	100	9.20	59	2.50	4		●
5586R304GHR05-1200	12.00	12	12	120	11.00	74	0.50	4		●
5586R304GHR30-1200	12.00	12	12	120	11.00	74	3.00	4		●
5586R304GHR10-1600	16.00	16	16	140	15.00	91	1.00	4		●
5586R304GHR40-1600	16.00	16	16	140	15.00	91	4.00	4		●

Art. Group No. / *Produktgruppe Nr.* : 025130

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
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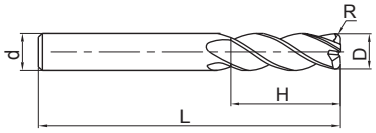
Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
✔	✔	✔	✔	✔		✔	✔				

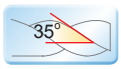
Code key B194/196 ISO Kennzeichen
Cutting data B293-368 Schnittdaten
Graphics identification & application B195/197 Graphische Werkzeug- & Anwendungsbeschr.
Order form for non-standard products B373-B372 Bestellformular für Sonderwerkzeuge

GM-4RL series for general machining · **GM-4RL** Serie für allgemeine Bearbeitung

4-flute radius end mills with straight shank
4-Schneiden Gesenkfräser mit Eckenradius u. Zylinderschaft













Type · Typ	Dimension(mm) Abmessungen					Teeth · Zähne Z	Grade · Sorte KMG 303
	D	R	d	H	L		
GM-4RL-D6.0R0.5	6.0	0.5	6	16	75	4	●
GM-4RL-D6.0R1.0	6.0	1.0	6	16	75	4	●
GM-4RL-D8.0R0.5	8.0	0.5	8	20	100	4	●
GM-4RL-D8.0R1.0	8.0	1.0	8	20	100	4	●
GM-4RL-D10.0R0.5	10.0	0.5	10	25	100	4	●
GM-4RL-D10.0R1.0	10.0	1.0	10	25	100	4	●
GM-4RL-D10.0R2.0	10.0	2.0	10	25	100	4	●
GM-4RL-D12.0R0.5	12.0	0.5	12	30	100	4	●
GM-4RL-D12.0R1.0	12.0	1.0	12	30	100	4	●
GM-4RL-D12.0R2.0	12.0	2.0	12	30	100	4	●
GM-4RL-D16.0R1.0	16.0	1.0	16	45	150	4	●
GM-4RL-D16.0R2.0	16.0	2.0	16	45	150	4	●

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

KMG303

Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
✔	✔	✔	✔			✔	✔			✔	✔

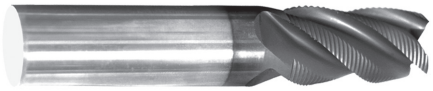
● Ex Stock / ab Lager ○ On demand / auf Anfrage

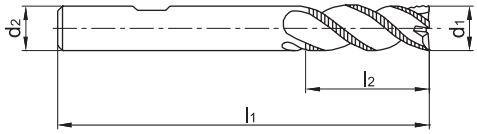
DIN 6527L Roughing end mills · DIN 6527L VHM Schruppfräser

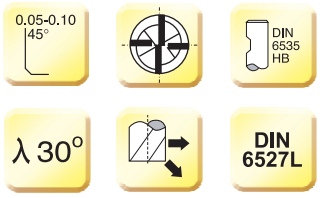


5602R303/304GR

KMG303: nano TiAlN coated ultra-fine carbide / *nano TiAlN beschichtetes Ultrafeinkornhartmetall*







Type *Typ*	Dimension(mm) *Abmessungen*				Teeth *Zähne*	Application *Anwendung*	P K S
	$d_1(h_{10})$	$d_2(h_6)$	l_2	l_1	z	Grade	KMG303
5602R303GR-0600	6	6	13	57	3		●
5602R303GR-0800	8	8	19	63	3		●
5602R304GR-1000	10	10	22	72	4		●
5602R304GR-1200	12	12	26	83	4		●
5602R304GR-1600	16	16	32	92	4		●
5602R304GR-2000	20	20	38	104	4		●
					Art. Group No. / *Produktgruppe Nr.* :		**021130**

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

KMG303

Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
✔	✔	✔	✔			✔	✔			✔	✔

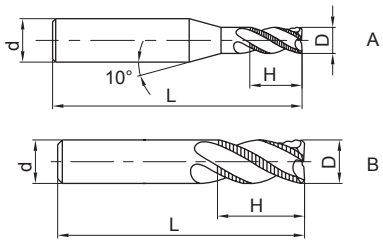
Code key B194/196 ISO Kennzeichen
Cutting data B293-368 Schnittdaten
Graphics identification & application B195/197 Graphische Werkzeug- & Anwendungsbeschr.
Order form for non-standard products B373-B372 Bestellformular für Sonderwerkzeuge

GM-4W series for general machining · GM-4W Serie für allgemeine Bearbeitung

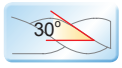
4-flute end mills with straight shank for roughing
4-Schneiden Schruppfräser mit Zylinderschaft



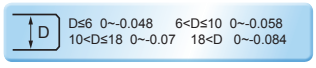




- Most suitable for effectively rough machining.









Type · Typ	Dimension(mm) Abmessungen				Teeth · Zähne Z	Geometry Ausführung	Grade · Sorte KMG 303
	D	d	H	L			
GM-4W-D6.0	6	6	16	50	4	B	●
GM-4W-D7.0	7	8	20	60	4	A	●
GM-4W-D8.0	8	8	20	60	4	B	●
GM-4W-D9.0	9	10	22	75	4	A	●
GM-4W-D10.0	10	10	25	75	4	B	●
GM-4W-D11.0	11	12	26	75	4	A	●
GM-4W-D12.0	12	12	30	75	4	B	●
GM-4W-D16.0	16	16	45	100	4	B	●
GM-4W-D20.0	20	20	45	100	4	B	●

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

KMG303

Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
✔	✔	✔	✔			✔	✔			✔	✔

● Ex Stock / ab Lager ○ On demand / auf Anfrage

HM

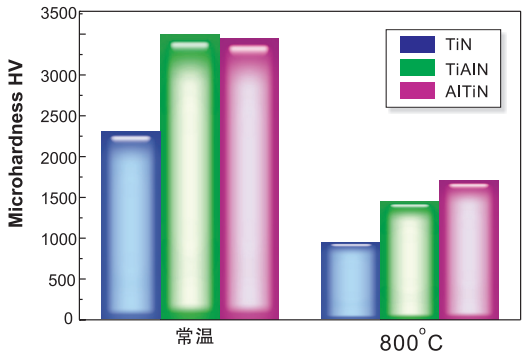
series end mills for machining high-hardness steel

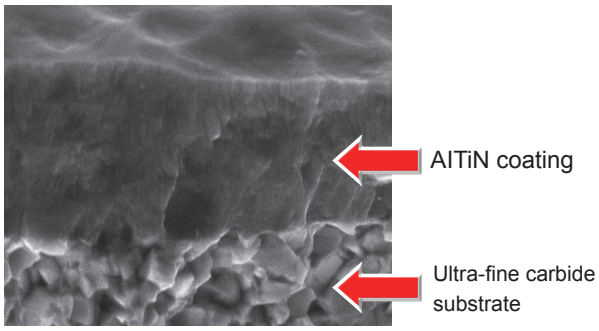
Serie Vollhartmetall Schaftfräser zur Bearbeitung von gehärtetem Stahl

1. Excellent tool design covers large chip pocket, good stability and high machining efficiency.
2. Optimized cutting geometrie (rake angle) assured edge stability and sharpness. The application area is wider.
3. The outstanding high cutting performance based on the perfect combination of ultrafine grain carbide substrate with high wear resistance and stable cutting edge.
4. The optimized Nano-AlTiN coating is the bases for hartmachining with high speed at high temperature.

1. Exzellentes Werkzeugzeug Design, mit großem Spanraum für kontrollierte Spanabfuhr, hervorragende Stabilität und höchste Bearbeitungswirtschaftlichkeit.
2. Trotz großem Spanwinkel und scharfer Schneide, ist die Schneidenstabilität gewährleistet. Der Anwendungsbereich wird dadurch deutlich erweitert.
3. Das Ultrafeine Hartmetall Substrat, und die optimierte Beschichtung ist speziell für die Bearbeitung von gehärteten Stahl entwickelt.
4. Die Nano-AlTiN Beschichtung ist perfekt geeignet für die Hartbearbearbeitung bei hohen Temperaturen.



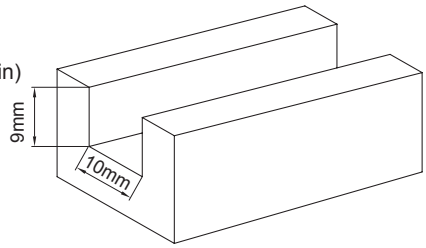




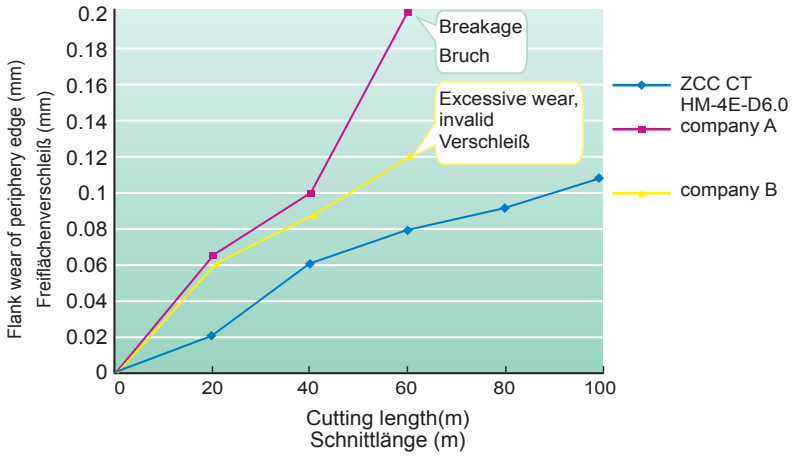
HM series end mills for machining high hardness steel
HM Serie Eckfräser für die Bearbeitung von gehärtetem Stahl

Tool type · Werkzeugtyp : HM-4E-D6.0

Size: Ø 6mm
Workpiece material
Werkstückstoff: SKD11(62HRC)
Rotating / Speed: 10000 r/min(188m/min)
Feed : 2000 mm/min (0.2mm/r)
Axial cutting depth: Ap=9mm
Radial cutting depth: Ae=0.1mm
Cutting style: cycloid machining
Cooling system: air blow
Machine: MIKRON UCP 1000

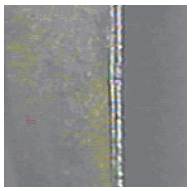


Cycloid machining of end mill
Zyklische Bearbeitung

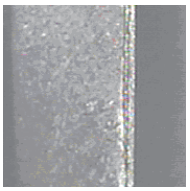


■ Tool wear · Werkzeugverschleiß

HM-4E-D6.0

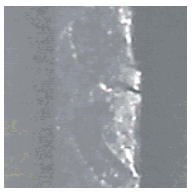


Cutting length: 60m
Schnittlänge: 60m



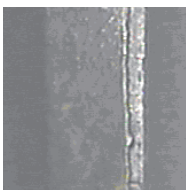
Cutting length: 100m
Schnittlänge: 100m

Similar product of company A



Cutting length: 60m
Schnittlänge: 60m

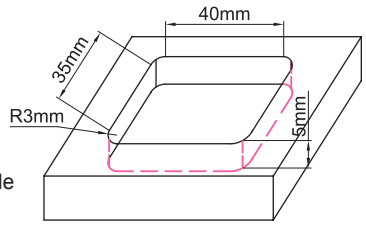
Similar product of company B



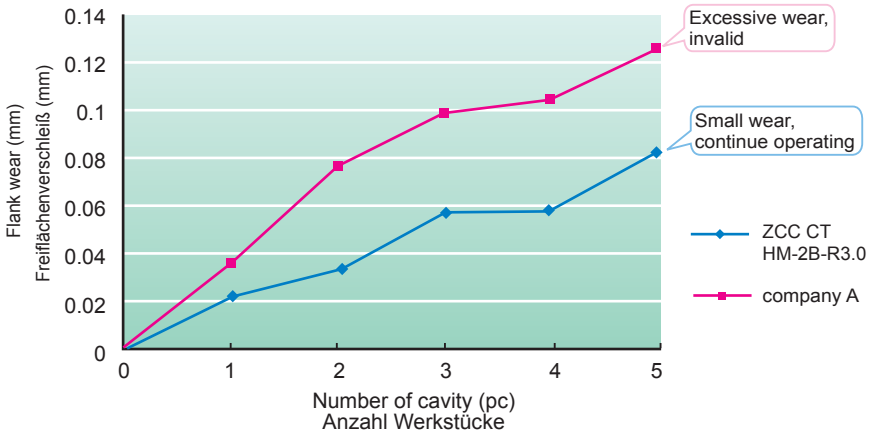
Cutting length: 60m
Schnittlänge: 60m

Tool type: HM-2B-R3.0

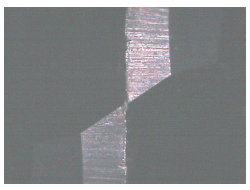
Size: Ø 3.0mm
Workpiece material
Werkstückstoff: SKD61(52HRC)
Rotating speed: 6400r/min (120m/min)
Feed: 1280mm/min (0.2mm/r)
Axial cutting depth: Ap=0.12mm
Radial cutting depth: Ae=0.24mm
Cutting style: machining cavity with 2° taper angle
Cooling system: air blow
Machine: MIKRON UCP 1000



Cavity machining with ball nose end mills
Auskammern mit Kugelkopffräsern



■ Wear after machining 5 cavities
Verschleiß nach 5 Werkstücken



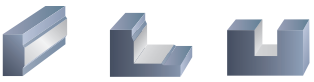
HM-2B-R3.0



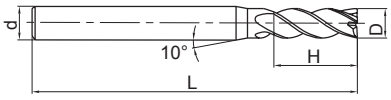
Similar product of company A

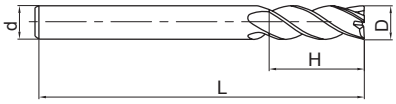
HM-4E series for machining high hardness steel · HM-4E Serie für die Hartbearbeitung

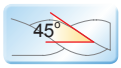
4-flute end mills with straight shank
4-Schneiden Schaftfräser mit Zylinderschaft

















Type · Typ	Dimension(mm) Abmessungen				Teeth · Zähne Z	Geometry Ausführung	Grade · Sorte KMG 555
	D	d	H	L			
HM-4E-D1.0S	1.0	4	3	50	4	A	●
HM-4E-D1.5S	1.5	4	4	50	4	A	●
HM-4E-D2.0S	2.0	4	6	50	4	A	●
HM-4E-D2.5S	2.5	4	8	50	4	A	●
HM-4E-D3.0S	3.0	4	8	50	4	A	●
HM-4E-D4.0S	4.0	4	11	50	4	B	●
HM-4E-D1.0	1.0	6	3	50	4	A	●
HM-4E-D1.5	1.5	6	4	50	4	A	●
HM-4E-D2.0	2.0	6	6	50	4	A	●
HM-4E-D2.5	2.5	6	8	50	4	A	●
HM-4E-D3.0	3.0	6	8	50	4	A	●
HM-4E-D3.5	3.5	6	10	50	4	A	●
HM-4E-D4.0	4.0	6	11	50	4	A	●
HM-4E-D4.5	4.5	6	11	50	4	A	●
HM-4E-D5.0	5.0	6	13	50	4	A	●
HM-4E-D5.5	5.5	6	16	50	4	A	●
HM-4E-D6.0	6.0	6	16	50	4	B	●
HM-4E-D7.0	7.0	8	20	60	4	A	●
HM-4E-D8.0	8.0	8	20	60	4	B	●
HM-4E-D9.0	9.0	10	22	75	4	A	●
HM-4E-D10.0	10.0	10	25	75	4	B	●
HM-4E-D11.0	11.0	12	26	75	4	A	●
HM-4E-D12.0	12.0	12	30	75	4	B	●
HM-4E-D14.0	14.0	14	32	75	4	B	●
HM-4E-D16.0	16.0	16	45	100	4	B	●
HM-4E-D18.0	18.0	18	45	100	4	B	●
HM-4E-D20.0	20.0	20	45	100	4	B	●

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

KMG555

Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
			✔	✔	✔		✔				

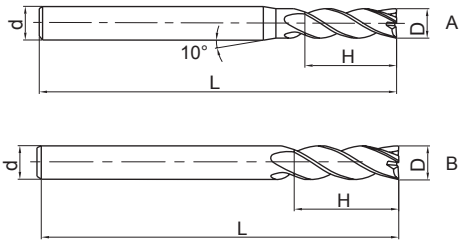
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ISO Kennzeichen
Cutting data B293-368
Schnittdaten
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Graphische Werkzeug- & Anwendungsbeschr.
Order form for non-standard products B373-B372
Bestellformular für Sonderwerkzeuge

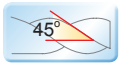
HM-4EL series for machining high hardness steel · HM-4EL Serie für die Hartbearbeitung

4-flute end mills with straight shank and long cutting edges
4-Schneiden Schaftfräser mit Zylinderschaft und langer Schneide

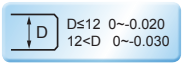














Type · Typ	Dimension(mm) Abmessungen				Teeth · Zähne Z	Geometry Ausführung	Grade · Sorte KMG 555
	D	d	H	L			
HM-4EL-D3.0	3.0	6	12	75	4	A	●
HM-4EL-D4.0	4.0	6	15	75	4	A	●
HM-4EL-D5.0	5.0	6	20	75	4	A	●
HM-4EL-D6.0	6.0	6	20	75	4	B	●
HM-4EL-D8.0	8.0	8	25	100	4	B	●
HM-4EL-D10.0	10.0	10	30	100	4	B	●
HM-4EL-D12.0	12.0	12	35	100	4	B	●
HM-4EL-D14.0	14.0	14	40	100	4	B	●
HM-4EL-D16.0	16.0	16	50	150	4	B	●
HM-4EL-D20.0	20.0	20	55	150	4	B	●

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

KMG555

Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
			✔	✔	✔		✔				

● Ex Stock / ab Lager ○ On demand / auf Anfrage

DIN 6527L mills for HSC machining high hardness steel (HRC>48)
DIN 6527L VHM Radiusfräser für die Hartbearbeitung im HSC Bereich (HRC>48)

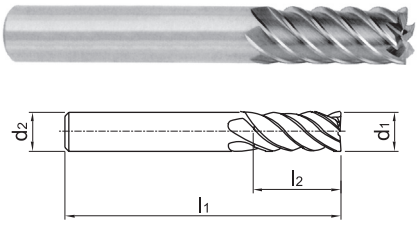


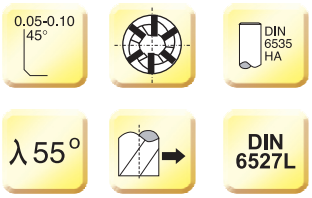


5502R55MHH

KMG405: nano AlTiN Coated Untra-fine carbide / *nano AlTiN beschichtetes Ultrafeinkornhartmetall*
For HSC maching of steel (HRC<63) / *Für HSC Bearbeitung von Stahl (HRC<63)*

KMG555: nano AlTixN Coated Super-fine carbide / *nano AlTixN beschichtetes Superfeinkornhartmetall*
For HSC maching and dry maching of steel (HRC<=70) /
Für HSC Bearbeitung und Trockenbearbeitung vom Stahl (HRC<=70)





Type *Typ*	Dimension(mm) *Abmessungen*				Teeth *Zähne*	Application *Anwendung*	H	
	$d_1(e_8)$	$d_2(h_6)$	l_2	l_1	z	Grade	KMG555	KMG405
5502R55MHH-0300	3.00	6	8	57	4		●	●
5502R55MHH-0400	4.00	6	11	57	4		●	●
5502R55MHH-0500	5.00	6	13	57	5		●	●
5502R55MHH-0600	6.00	6	13	57	6		●	●
5502R55MHH-0800	8.00	8	19	63	6		●	●
5502R55MHH-1000	10.00	10	22	72	6		●	●
5502R55MHH-1200	12.00	12	26	83	6		●	●
5502R55MHH-1600	16.00	16	32	92	6		●	●
5502R55MHH-2000	20.00	20	38	104	8		●	●

Art. Group No. / *Produktgruppe Nr.* : 024130

KMG555

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
		✔	✔	✔	✔		✔				

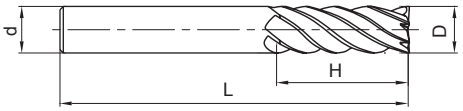
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ISO Kennzeichen
Cutting data B293-368
Schnittdaten
Graphics identification & application B195/197
Graphische Werkzeug- & Anwendungsbeschr.
Order form for non-standard products B373-B372
Bestellformular für Sonderwerkzeuge

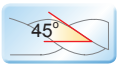
HM-6EL series for machining high hardness steel · HM-6EL Serie für die Hartbearbeitung im HSC Ber.

6-flute end mills with straight shank and long cutting edges
6-Schneiden Schaftfräser mit Zylinderschaft und langer Schneide

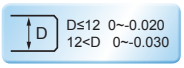














Type · Typ	Dimension(mm) Abmessungen				Teeth · Zähne Z	Grade · Sorte KMG 555
	D	d	H	L		
HM-6EL-D6.0	6.0	6	24	75	6	●
HM-6EL-D8.0	8.0	8	32	75	6	●
HM-6EL-D10.0	10.0	10	40	100	6	●
HM-6EL-D12.0	12.0	12	45	100	6	●
HM-6EL-D16.0	16.0	16	64	150	6	●
HM-6EL-D20.0	20.0	20	75	150	6	●

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

KMG555

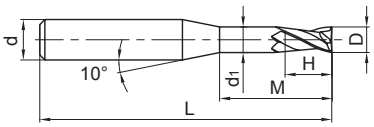
Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
			✔	✔	✔		✔				

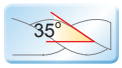
● Ex Stock / ab Lager ○ On demand / auf Anfrage

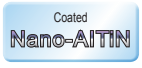
HM-2EP series for machining high hardness steel · HM-2EP Serie für die Hartbearbeitung

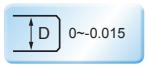
2-flute slot end mills with short cutting edge and long neck
2-Schneiden Nutenfräser mit kurzer Schneide und Zylinderschaft













Type · Typ	Dimension(mm) Abmessungen						Teeth · Zähne Z	Grade · Sorte KMG 555
	D	d	H	M	d_1	L		
HM-2EP-D0.5-M04	0.5	4.0	0.7	4.0	0.45	50	2	●
HM-2EP-D0.5-M06	0.5	4.0	0.7	6.0	0.45	50	2	●
HM-2EP-D0.5-M08	0.5	4.0	0.7	8.0	0.45	50	2	●
HM-2EP-D0.8-M04	0.8	4.0	1.2	4.0	0.75	50	2	●
HM-2EP-D0.8-M06	0.8	4.0	1.2	6.0	0.75	50	2	●
HM-2EP-D0.8-M08	0.8	4.0	1.2	8.0	0.75	50	2	●
HM-2EP-D0.8-M10	0.8	4.0	1.2	10.0	0.75	50	2	●
HM-2EP-D1.0-M04	1.0	4.0	1.5	4.0	0.95	50	2	●
HM-2EP-D1.0-M06	1.0	4.0	1.5	6.0	0.95	50	2	●
HM-2EP-D1.0-M08	1.0	4.0	1.5	8.0	0.95	50	2	●
HM-2EP-D1.0-M10	1.0	4.0	1.5	10.0	0.95	50	2	●
HM-2EP-D1.0-M12	1.0	4.0	1.5	12.0	0.95	50	2	●
HM-2EP-D1.0-M14	1.0	4.0	1.5	14.0	0.95	50	2	●
HM-2EP-D1.2-M06	1.2	4.0	1.8	6.0	1.15	50	2	●
HM-2EP-D1.2-M08	1.2	4.0	1.8	8.0	1.15	50	2	●
HM-2EP-D1.2-M10	1.2	4.0	1.8	10.0	1.15	50	2	●
HM-2EP-D1.2-M12	1.2	4.0	1.8	12.0	1.15	50	2	●
HM-2EP-D1.5-M06	1.5	4.0	2.3	6.0	1.45	50	2	●
HM-2EP-D1.5-M08	1.5	4.0	2.3	8.0	1.45	50	2	●
HM-2EP-D1.5-M10	1.5	4.0	2.3	10.0	1.45	50	2	●
HM-2EP-D1.5-M12	1.5	4.0	2.3	12.0	1.45	50	2	●
HM-2EP-D1.5-M14	1.5	4.0	2.3	14.0	1.45	50	2	●
HM-2EP-D2.0-M06	2.0	4.0	3.0	6.0	1.95	50	2	●
HM-2EP-D2.0-M08	2.0	4.0	3.0	8.0	1.95	50	2	●
HM-2EP-D2.0-M10	2.0	4.0	3.0	10.0	1.95	50	2	●
HM-2EP-D2.0-M12	2.0	4.0	3.0	12.0	1.95	50	2	●
HM-2EP-D2.0-M14	2.0	4.0	3.0	14.0	1.95	50	2	●
HM-2EP-D2.0-M16	2.0	4.0	3.0	16.0	1.95	50	2	●

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

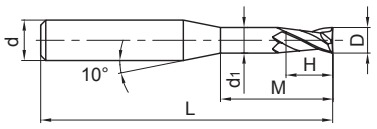
Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
			✔	✔	✔		✔				

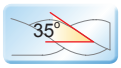
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ISO Kennzeichen
Cutting data B293-368
Schnittdaten
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Order form for non-standard products B373-B372
Bestellformular für Sonderwerkzeuge

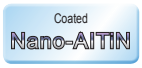
HM-2EP series for machining high hardness steel · HM-2EP Serie für die Hartbearbeitung

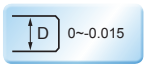
2-flute slot end mills with short cutting edge and long neck
2-Schneiden Nutenfräser mit kurzer Schneide und Zylinderschaft

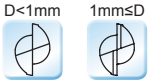












Type · Typ	Dimension(mm) Abmessungen						Teeth · Zähne Z	Grade · Sorte KMG 555
	D	d	H	M	d_1	L		
HM-2EP-D2.5-M08	2.5	4.0	3.7	8.0	2.4	50	2	●
HM-2EP-D2.5-M10	2.5	4.0	3.7	10.0	2.4	50	2	●
HM-2EP-D2.5-M12	2.5	4.0	3.7	12.0	2.4	50	2	●
HM-2EP-D2.5-M14	2.5	4.0	3.7	14.0	2.4	50	2	●
HM-2EP-D2.5-M16	2.5	4.0	3.7	16.0	2.4	60	2	●
HM-2EP-D2.5-M18	2.5	4.0	3.7	18.0	2.4	60	2	●
HM-2EP-D2.5-M20	2.5	4.0	3.7	20.0	2.4	60	2	●
HM-2EP-D3.0-M06	3.0	6.0	4.5	6.0	2.85	50	2	●
HM-2EP-D3.0-M08	3.0	6.0	4.5	8.0	2.85	50	2	●
HM-2EP-D3.0-M10	3.0	6.0	4.5	10.0	2.85	50	2	●
HM-2EP-D3.0-M12	3.0	6.0	4.5	12.0	2.85	50	2	●
HM-2EP-D3.0-M14	3.0	6.0	4.5	14.0	2.85	60	2	●
HM-2EP-D3.0-M16	3.0	6.0	4.5	16.0	2.85	60	2	●
HM-2EP-D3.0-M18	3.0	6.0	4.5	18.0	2.85	60	2	●
HM-2EP-D3.0-M20	3.0	6.0	4.5	20.0	2.85	60	2	●
HM-2EP-D4.0-M12	4.0	6.0	6.0	12.0	3.85	60	2	●
HM-2EP-D4.0-M16	4.0	6.0	6.0	16.0	3.85	60	2	●
HM-2EP-D4.0-M20	4.0	6.0	6.0	20.0	3.85	60	2	●
HM-2EP-D4.0-M25	4.0	6.0	6.0	25.0	3.85	60	2	●
HM-2EP-D5.0-M16	5.0	6.0	7.5	16.0	4.85	60	2	●
HM-2EP-D5.0-M25	5.0	6.0	7.5	25.0	4.85	70	2	●

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

KMG555

Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
			✔	✔	✔		✔				

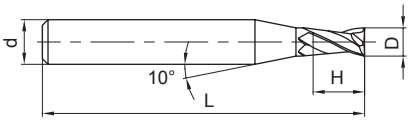
● Ex Stock / ab Lager ○ On demand / auf Anfrage

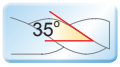
HM-2ES series machining high hardness steel · HM-2ES Serie für die Hartbearbeitung

2-flute tiny diameter end mills with straight shank
2-Schneiden Mirco-Fräser mit Zylinderschaft



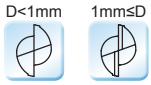












Type · Typ	Dimension(mm) · Abmessungen				Teeth · Zähne Z	Grade · Sorte KMG 555
	D	d	H	L		
HM-2ES-D0.3	0.3	4.0	0.6	50	2	●
HM-2ES-D0.4	0.4	4.0	0.8	50	2	●
HM-2ES-D0.5	0.5	4.0	1.0	50	2	●
HM-2ES-D0.6	0.6	4.0	1.2	50	2	●
HM-2ES-D0.7	0.7	4.0	1.4	50	2	●
HM-2ES-D0.8	0.8	4.0	1.6	50	2	●
HM-2ES-D0.9	0.9	4.0	1.8	50	2	●
HM-2ES-D1.0	1.0	4.0	2.0	50	2	●
HM-2ES-D1.1	1.1	4.0	2.0	50	2	●
HM-2ES-D1.2	1.2	4.0	2.5	50	2	●
HM-2ES-D1.3	1.3	4.0	2.5	50	2	●
HM-2ES-D1.4	1.4	4.0	3.0	50	2	●
HM-2ES-D1.5	1.5	4.0	3.0	50	2	●
HM-2ES-D1.6	1.6	4.0	3.5	50	2	●
HM-2ES-D1.7	1.7	4.0	3.5	50	2	●
HM-2ES-D1.8	1.8	4.0	4.0	50	2	●
HM-2ES-D1.9	1.9	4.0	4.0	50	2	●
HM-2ES-D2.0	2.0	4.0	4.0	50	2	●
HM-2ES-D2.1	2.1	4.0	4.0	50	2	●
HM-2ES-D2.2	2.2	4.0	4.5	50	2	●
HM-2ES-D2.3	2.3	4.0	4.5	50	2	●
HM-2ES-D2.4	2.4	4.0	5.0	50	2	●
HM-2ES-D2.5	2.5	4.0	5.0	50	2	●
HM-2ES-D2.6	2.6	4.0	5.0	50	2	●
HM-2ES-D2.7	2.7	4.0	5.5	50	2	●
HM-2ES-D2.8	2.8	4.0	5.5	50	2	●
HM-2ES-D2.9	2.9	4.0	6.0	50	2	●
HM-2ES-D3.0	3.0	4.0	6.0	50	2	●

Material Overview · Material Übersicht

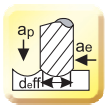
✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

KMG555

Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
			✔	✔	✔		✔				

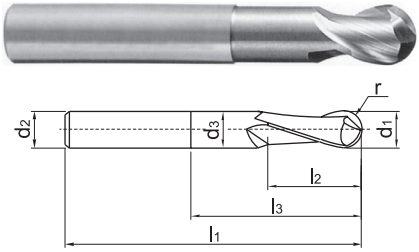
Code key B194/196
ISO Kennzeichen
Cutting data B293-368
Schnittdaten
Graphics identification & application B195/197
Graphische Werkzeug- & Anwendungsbeschr.
Order form for non-standard products B373-B372
Bestellformular für Sonderwerkzeuge

ZCC CT 2-flute ball nose end mills for HSC machining high hardness steel (HRC>48) short
ZCC CT 2 Schneiden VHM Vollradiusfräser für Hartbearbeitung im HSC Bereich (HRC>48) kurz



5565R302GH

KMG405: nano AlTiN Coated Untra-fine carbide / *nano AlTiN beschichtetes Ultrafeinkornhartmetall*





Type *Typ*	Dimension(mm) *Abmessungen*								Teeth *Zähne*	Application *Anwendung*	P K H
	d_1	$d_2(h_6)$	l_2	l_1	d_3	l_3	$r(f_8)$	α°	z	Grade	KMG405
5565R302GH-0300	3.00	6	4	57	2.80	9	1.50	6	2		●
5565R302GH-0400	4.00	6	5	57	3.70	12	2.00	4	2		●
5565R302GH-0500	5.00	6	6	57	4.60	15	2.50	2	2		●
5565R302GH-0600	6.00	6	7	57	5.50	20	3.00		2		●
5565R302GH-0800	8.00	8	9	63	7.40	26	4.00		2		●
5565R302GH-1000	10.00	10	11	72	9.20	31	5.00		2		●
5565R302GH-1200	12.00	12	12	83	11.00	37	6.00		2		●
5565R302GH-1600	16.00	16	16	92	15.00	43	8.00		2		●
										Art. Group No. / *Produktgruppe Nr.* :	**025130**

Material Overview · Material Übersicht

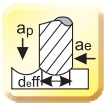
✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

KMG405

Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
		✔	✔	✔			✔				

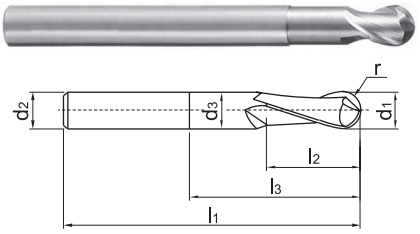
● Ex Stock / ab Lager ○ On demand / auf Anfrage

ZCC CT 2-flute ball nose end mills for HSC machining high hardness steel (HRC>48) lang
ZCC CT 2 Schneiden VHM Vollradiusfräser für Hartbearbeitung im HSC Bereich (HRC>48) lang



5566R302GH

KMG405: nano AlTiN Coated Untra-fine carbide / *nano AlTiN beschichtetes Ultrafeinkornhartmetall*





Type *Typ*	Dimension(mm) *Abmessungen*								Teeth *Zähne*	Application *Anwendung*	P K H
	d_1	$d_2(h_6)$	l_2	l_1	d_3	l_3	$r(f_8)$	α°	z	Grade	KMG405
5566R302GH-0300	3.00	6	4	75	2.80	9	1.50	6	2		●
5566R302GH-0400	4.00	6	5	75	3.70	12	2.00	4	2		●
5566R302GH-0500	5.00	6	6	80	4.60	15	2.50	2	2		●
5566R302GH-0600	6.00	6	7	80	5.50	20	3.00		2		●
5566R302GH-0800	8.00	8	9	90	7.40	26	4.00		2		●
5566R302GH-1000	10.00	10	11	100	9.20	31	5.00		2		●
5566R302GH-1200	12.00	12	12	120	11.00	37	6.00		2		●

Art. Group No. / *Produktgruppe Nr.* : 025130

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
		✔	✔	✔			✔				

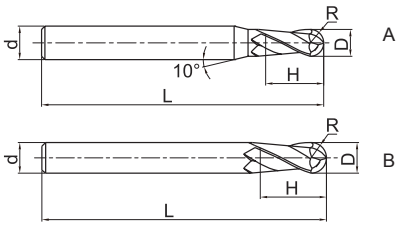
Code key B194/196 ISO Kennzeichen
Cutting data B293-368 Schnittdaten
Graphics identification & application B195/197 Graphische Werkzeug- & Anwendungsbeschr.
Order form for non-standard products B373-B372 Bestellformular für Sonderwerkzeuge

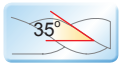
HM-2B series machining high hardness steel · HM-2B Serie für die Hartbearbeitung

2-flute ball nose end mills with straight shank
2-Schneiden Kugelkopffräser mit Zylinderschaft

















Type · Typ	Dimension(mm) Abmessungen					Teeth · Zähne Z	Geometry Ausführung	Grade · Sorte KMG 555
	D	R	d	H	L			
HM-2B-R0.5S	1.0	0.5	4.0	2.0	50	2	A	●
HM-2B-R0.75S	1.5	0.75	4.0	3.0	50	2	A	●
HM-2B-R1.0S	2.0	1.0	4.0	4.0	50	2	A	●
HM-2B-R1.25S	2.5	1.25	4.0	5.0	50	2	A	●
HM-2B-R1.5S	3.0	1.5	4.0	6.0	50	2	A	●
HM-2B-R2.0S	4.0	2.0	4.0	8.0	50	2	B	●
HM-2B-R0.5	1.0	0.5	6.0	2.0	50	2	A	●
HM-2B-R0.75	1.5	0.75	6.0	3.0	50	2	A	●
HM-2B-R1.0	2.0	1.0	6.0	4.0	50	2	A	●
HM-2B-R1.25	2.5	1.25	6.0	5.0	50	2	A	●
HM-2B-R1.5	3.0	1.5	6.0	6.0	50	2	A	●
HM-2B-R1.75	3.5	1.75	6.0	8.0	50	2	A	●
HM-2B-R2.0	4.0	2.0	6.0	8.0	50	2	A	●
HM-2B-R2.5	5.0	2.5	6.0	10.0	50	2	A	●
HM-2B-R2.75	5.5	2.75	6.0	12.0	50	2	A	●
HM-2B-R3.0	6.0	3.0	6.0	12.0	50	2	B	●
HM-2B-R3.5	7.0	3.5	8.0	14.0	60	2	A	●
HM-2B-R4.0	8.0	4.0	8.0	16.0	60	2	B	●
HM-2B-R4.5	9.0	4.5	10.0	18.0	75	2	A	●
HM-2B-R5.0	10.0	5.0	10.0	20.0	75	2	B	●
HM-2B-R6.0	12.0	6.0	12.0	24.0	75	2	B	●
HM-2B-R7.0	14.0	7.0	14.0	28.0	75	2	B	●
HM-2B-R8.0	16.0	8.0	16.0	32.0	100	2	B	●
HM-2B-R10.0	20.0	10.0	20.0	40.0	100	2	B	●

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

KMG555

Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
			✔	✔	✔		✔				

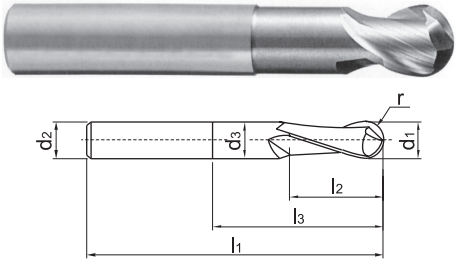
● Ex Stock / ab Lager ○ On demand / auf Anfrage

ZCC CT 2-flute ball nose end mills for HSC machining high hardness steel (HRC>48)
ZCC CT 2 Schneiden VHM Kugelkopffräser für Hartbearbeitung im HSC Bereich (HRC>48)



5565R302HH

KMG405: nano AlTiN Coated Untra-fine carbide / *nano AlTiN beschichtetes Ultrafeinkornhartmetall*





Type *Typ*	Dimension(mm) *Abmessungen*								Teeth *Zähne*	Application *Anwendung*	K H
	d_1	$d_2(h_6)$	l_2	l_1	d_3	l_3	$r(f_8)$	α°	z	Grade	KMG405
5565R302HH-0300	3	6	4	57	2.8	9	1.5	6	2		●
5565R302HH-0400	4	6	5	57	3.7	12	2.0	4	2		●
5565R302HH-0500	5	6	6	57	4.6	15	2.5	2	2		●
5565R302HH-0600	6	6	7	57	5.5	20	3.0		2		●
5565R302HH-0800	8	8	9	63	7.4	26	4.0		2		●
5565R302HH-1000	10	10	11	72	9.2	31	5.0		2		●
5565R302HH-1200	12	12	12	83	11	37	6.0		2		●
5565R302HH-1600	16	16	16	92	15	43	8.0		2		●

Art. Group No. / *Produktgruppe Nr.* : 026130

KMG405

Material Overview · Material Übersicht

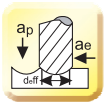
✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
		✔	✔	✔	✔		✔				

Code key B194/196
ISO Kennzeichen
Cutting data B293-368
Schnittdaten
Graphics identification & application B195/197
Graphische Werkzeug- & Anwendungsbeschr.
Order form for non-standard products B373-B372
Bestellformular für Sonderwerkzeuge

ZCC CT 2-flute ball nose end mills for HSC machining high hardness steel (HRC>48)
ZCC CT 2 Schneiden VHM Kugelkopffräser für Hartbearbeitung im HSC Bereich (HRC>48)

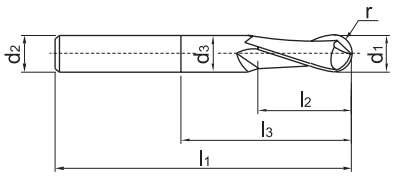




5566R302HH

KMG405: nano AlTiN Coated Untra-fine carbide / *nano AlTiN beschichtetes Ultrafeinkornhartmetall*







Type *Typ*	Dimension(mm) *Abmessungen*								Teeth *Zähne*	Application *Anwendung*	K H
	d_1	$d_2(h_6)$	l_2	l_1	d_3	l_3	$r(f_8)$	α°	z	Grade	KMG405
5566R302HH-0300	3	6	4	75	2.8	9	1.5	6	2		●
5566R302HH-0400	4	6	5	75	3.7	12	2.0	4	2		●
5566R302HH-0500	5	6	6	80	4.6	15	2.5	2	2		●
5566R302HH-0600	6	6	7	80	5.5	20	3.0		2		●
5566R302HH-0800	8	8	9	90	7.4	26	4.0		2		●
5566R302HH-1000	10	10	11	100	9.2	31	5.0		2		●
5566R302HH-1200	12	12	12	120	11.0	37	6.0		2		●

Art. Group No. / *Produktgruppe Nr.* : 026130

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

KMG405

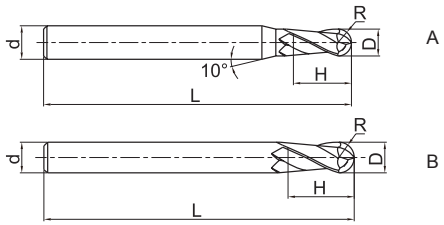
Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
		✔	✔	✔	✔		✔				

● Ex Stock / ab Lager ○ On demand / auf Anfrage

HM-2BL series for machining high hardness steel · **HM-2BL** Serie für die Hartbearbeitung

2-flute ball nose end mills with long straight shank
2-Schneiden Nutenfräser mit langem Zylinderschaft





35° | Coated Nano-AlTiN | D D≤12 0~-0.020 12<D 0~-0.030 | R R±0.01

Type · Typ	Dimension(mm) Abmessungen					Teeth · Zähne Z	Geometry Ausführung	Grade · Sorte KMG 555
	D	R	d	H	L			
HM-2BL-R1.0	2.0	1.0	6.0	4.0	75	2	A	●
HM-2BL-R1.25	2.5	1.25	6.0	6.0	75	2	A	●
HM-2BL-R1.5	3.0	1.5	6.0	6.0	75	2	A	●
HM-2BL-R1.75	3.5	1.75	6.0	8.0	75	2	A	●
HM-2BL-R2.0	4.0	2.0	6.0	8.0	75	2	A	●
HM-2BL-R2.5	5.0	2.5	6.0	10.0	75	2	A	●
HM-2BL-R2.75	5.5	2.75	6.0	12.0	75	2	A	●
HM-2BL-R3.0	6.0	3.0	6.0	12.0	75	2	B	●
HM-2BL-R3.5	7.0	3.5	8.0	14.0	75	2	A	●
HM-2BL-R4.0	8.0	4.0	8.0	16.0	100	2	B	●
HM-2BL-R4.5	9.0	4.5	10.0	18.0	100	2	A	●
HM-2BL-R5.0	10.0	5.0	10.0	20.0	100	2	B	●
HM-2BL-R6.0	12.0	6.0	12.0	24.0	100	2	B	●
HM-2BL-R7.0	14.0	7.0	14.0	28.0	100	2	B	●
HM-2BL-R8.0	16.0	8.0	16.0	32.0	150	2	B	●
HM-2BL-R10.0	20.0	10.0	20.0	40.0	150	2	B	●

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

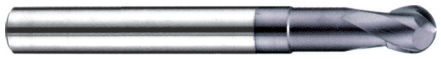
KMG555

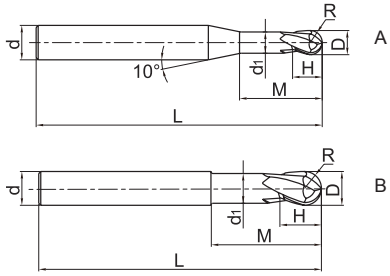
Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
			✔	✔	✔		✔				

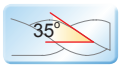
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Cutting data B293-368 Schnittdaten
Graphics identification & application B195/197 Graphische Werkzeug- & Anwendungsbeschr.
Order form for non-standard products B373-B372 Bestellformular für Sonderwerkzeuge

HM-2BFP series for machining high hardness steel · HM-2BFP Serie für die Hartbearbeitung

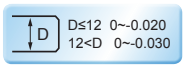
2-flute ball nose mills with long straight shank
2-Schneiden Kugelkopffräser mit langem Zylinderschaft















Type · Typ	Dimension(mm) Abmessungen							Teeth · Zähne Z	Geometry Ausführung	Grade · Sorte KMG 555
	D	R	H	d_1	M	d	L			
HM-2BFP-R0.5	1.0	0.5	1.0	0.95	2.5	6	75	2	A	○
HM-2BFP-R0.75	1.5	0.75	1.5	1.45	3.0	6	75	2	A	○
HM-2BFP-R1.0	2.0	1.0	2.0	1.95	4.0	6	75	2	A	○
HM-2BFP-R1.5	3.0	1.5	3.0	2.85	6.0	6	75	2	A	○
HM-2BFP-R2.0	4.0	2.0	4.0	3.85	8.0	6	75	2	A	○
HM-2BFP-R2.5	5.0	2.5	5.0	4.85	10.0	6	75	2	A	○
HM-2BFP-R3.0	6.0	3.0	6.0	5.8	12.0	6	75	2	B	○
HM-2BFP-R4.0	8.0	4.0	8.0	7.8	16.0	8	100	2	B	○
HM-2BFP-R5.0	10.0	5.0	10	9.6	20.0	10	100	2	B	○
HM-2BFP-R6.0	12.0	6.0	12	11.5	24.0	12	100	2	B	○
HM-2BFP-R8.0	16.0	8.0	16	15.5	32.0	16	150	2	B	○
HM-2BFP-R10.0	20.0	10.0	20	19.5	40.0	20	150	2	B	○

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

KMG555

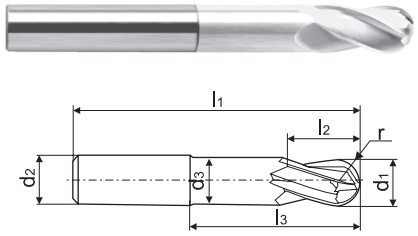
Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
			✔	✔	✔		✔				

● Ex Stock / ab Lager ○ On demand / auf Anfrage

ZCC CT 4-flute ball nose end mills for HSC machining high hardness steel (HRC>48) short
ZCC CT 4 Schneiden VHM Kugelkopffräser für Hartbearbeitung im HSC Bereich (HRC>48) kurz

5566R304HH

KMG405: nano AlTiN Coated Untra-fine carbide / *nano AlTiN beschichtetes Ultrafeinkornhartmetall*



λ 30°
DIN 6535 HA
ZCCCT NORM

Type *Typ*	Dimension(mm) *Abmessungen*							Teeth *Zähne*	Application *Anwendung*	K H
	d_1	$d_2(h_6)$	l_2	l_1	d_3	l_3	$r(js_8)$	z	Grade	KMG405
5566R304HH-0600	6.00	6	7	80	5.50	20	3.00	4		●
5566R304HH-0800	8.00	8	9	90	7.40	26	4.00	4		●
5566R304HH-1000	10.00	10	11	100	9.20	31	5.00	4		●
5566R304HH-1200	12.00	12	12	120	11.00	37	6.00	4		●
									Art. Group No. / *Produktgruppe Nr.* :	**024130**

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

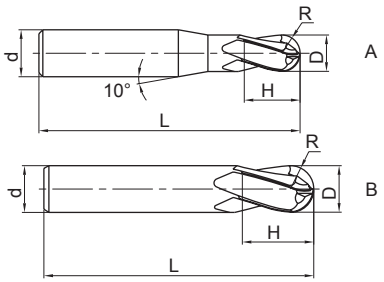
Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
		✔	✔	✔	✔		✔				

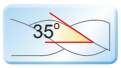
Code key B194/196 ISO Kennzeichen
Cutting data B293-368 Schnittdaten
Graphics identification & application B195/197 Graphische Werkzeug- & Anwendungsbeschr.
Order form for non-standard products B373-B372 Bestellformular für Sonderwerkzeuge

HM-4B series for machining high hardness steel · HM-4B Serie für die Hartbearbeitung

4-flute ball nose mills with long straight shank
4-Schneiden Kugelkopffräser mit Zylinderschaft















Type · Typ	Dimension(mm) Abmessungen					Teeth · Zähne Z	Geometry Ausführung	Grade · Sorte KMG 555
	D	R	d	H	L			
HM-4B-R1.5	3.0	1.5	6.0	6.0	50	4	A	●
HM-4B-R2.0	4.0	2.0	6.0	8.0	50	4	A	●
HM-4B-R2.5	5.0	2.5	6.0	10.0	50	4	A	●
HM-4B-R3.0	6.0	3.0	6.0	12.0	50	4	B	●
HM-4B-R4.0	8.0	4.0	8.0	16.0	60	4	B	●
HM-4B-R5.0	10.0	5.0	10.0	20.0	75	4	B	●
HM-4B-R6.0	12.0	6.0	12.0	24.0	75	4	B	●
HM-4B-R7.0	14.0	7.0	14.0	28.0	75	4	B	●
HM-4B-R8.0	16.0	8.0	16.0	32.0	100	4	B	●
HM-4B-R9.0	18.0	9.0	18.0	36.0	100	4	B	●
HM-4B-R10.0	20.0	10.0	20.0	40.0	100	4	B	●

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

KMG555

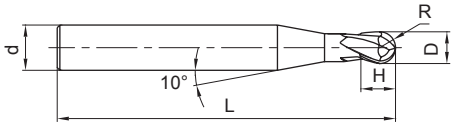
Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
			✔	✔	✔		✔				

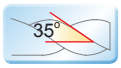
● Ex Stock / ab Lager ○ On demand / auf Anfrage

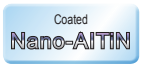
HM-2BS series for machining high hardness steel · HM-2BS Serie für die Hartbearbeitung

2-flute tiny diameter ball nose end mills with straight shank
2-Schneiden Mirco-Kugelkopffräser mit Zylinderschaft

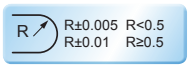














Type · Typ	Dimension(mm) Abmessungen					Teeth · Zähne Z	Grade · Sorte KMG 555
	D	R	d	H	L		
HM-2BS-R0.15	0.30	0.15	4.0	0.5	50	2	●
HM-2BS-R0.20	0.40	0.20	4.0	0.6	50	2	●
HM-2BS-R0.25	0.50	0.25	4.0	0.8	50	2	●
HM-2BS-R0.30	0.60	0.30	4.0	0.9	50	2	●
HM-2BS-R0.35	0.70	0.35	4.0	1.0	50	2	●
HM-2BS-R0.40	0.80	0.40	4.0	1.2	50	2	●
HM-2BS-R0.45	0.90	0.45	4.0	1.3	50	2	●
HM-2BS-R0.50	1.00	0.50	4.0	1.5	50	2	●
HM-2BS-R0.60	1.20	0.60	4.0	1.8	50	2	●
HM-2BS-R0.70	1.40	0.70	4.0	2.0	50	2	●
HM-2BS-R0.75	1.50	0.75	4.0	2.3	50	2	●
HM-2BS-R0.80	1.60	0.80	4.0	2.5	50	2	●
HM-2BS-R0.90	1.80	0.90	4.0	2.7	50	2	●
HM-2BS-R1.00	2.00	1.00	4.0	3.0	50	2	●
HM-2BS-R1.25	2.50	1.25	4.0	3.7	50	2	●
HM-2BS-R1.50	3.00	1.50	4.0	4.5	50	2	●

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

KMG555

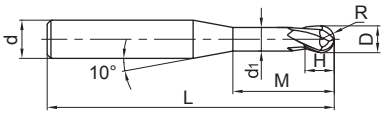
Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
			✔	✔	✔		✔				

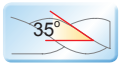
Code key B194/196
ISO Kennzeichen
Cutting data B293-368
Schnittdaten
Graphics identification & application B195/197
Graphische Werkzeug- & Anwendungsbeschr.
Order form for non-standard products B373-B372
Bestellformular für Sonderwerkzeuge

HM-2BP series for machining high hardness steel · HM-2BP Serie für die Hartbearbeitung

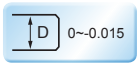
2-flute short cutting edge ball nose micro end mills with straight shank and long neck
2-Schneiden Micro Kugelkopffräser mit kurze Schneide und Zylinderschaft

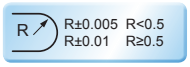














Type · Typ	Dimension(mm) Abmessungen							Teeth · Zähne Z	Grade · Sorte KMG 555
	D	R	H	d_1	M	d	L		
HM-2BP-R0.25-M04	0.5	0.25	0.7	0.45	4.0	4.0	50	2	●
HM-2BP-R0.25-M06	0.5	0.25	0.7	0.45	6.0	4.0	50	2	●
HM-2BP-R0.3-M04	0.6	0.3	0.9	0.55	4.0	4.0	50	2	●
HM-2BP-R0.3-M06	0.6	0.3	0.9	0.55	6.0	4.0	50	2	●
HM-2BP-R0.3-M08	0.6	0.3	0.9	0.55	8.0	4.0	50	2	●
HM-2BP-R0.4-M04	0.8	0.4	1.2	0.75	4.0	4.0	50	2	●
HM-2BP-R0.4-M06	0.8	0.4	1.2	0.75	6.0	4.0	50	2	●
HM-2BP-R0.4-M08	0.8	0.4	1.2	0.75	8.0	4.0	50	2	●
HM-2BP-R0.4-M10	0.8	0.4	1.2	0.75	10.0	4.0	50	2	●
HM-2BP-R0.5-M04	1.0	0.5	1.5	0.95	4.0	4.0	50	2	●
HM-2BP-R0.5-M06	1.0	0.5	1.5	0.95	6.0	4.0	50	2	●
HM-2BP-R0.5-M08	1.0	0.5	1.5	0.95	8.0	4.0	50	2	●
HM-2BP-R0.5-M10	1.0	0.5	1.5	0.95	10.0	4.0	50	2	●
HM-2BP-R0.5-M12	1.0	0.5	1.5	0.95	12.0	4.0	50	2	●
HM-2BP-R0.6-M06	1.2	0.6	1.8	1.15	6.0	4.0	50	2	●
HM-2BP-R0.6-M08	1.2	0.6	1.8	1.15	8.0	4.0	50	2	●
HM-2BP-R0.6-M12	1.2	0.6	1.8	1.15	12.0	4.0	50	2	●
HM-2BP-R0.6-M16	1.2	0.6	1.8	1.15	16.0	4.0	50	2	●
HM-2BP-R0.75-M08	1.5	0.75	2.3	1.45	8.0	4.0	50	2	●
HM-2BP-R0.75-M12	1.5	0.75	2.3	1.45	12.0	4.0	50	2	●
HM-2BP-R0.75-M16	1.5	0.75	2.3	1.45	16.0	4.0	50	2	●
HM-2BP-R1.0-M06	2.0	1.0	3.0	1.95	6.0	4.0	50	2	●
HM-2BP-R1.0-M08	2.0	1.0	3.0	1.95	8.0	4.0	50	2	●
HM-2BP-R1.0-M10	2.0	1.0	3.0	1.95	10.0	4.0	50	2	●
HM-2BP-R1.0-M12	2.0	1.0	3.0	1.95	12.0	4.0	50	2	●
HM-2BP-R1.0-M16	2.0	1.0	3.0	1.95	16.0	4.0	50	2	●
HM-2BP-R1.0-M20	2.0	1.0	3.0	1.95	20.0	4.0	50	2	●
HM-2BP-R1.25-M08	2.5	1.25	3.7	2.4	8.0	4.0	50	2	●
HM-2BP-R1.25-M12	2.5	1.25	3.7	2.4	12.0	4.0	50	2	●
HM-2BP-R1.25-M16	2.5	1.25	3.7	2.4	16.0	4.0	60	2	●
HM-2BP-R1.25-M20	2.5	1.25	3.7	2.4	20.0	4.0	60	2	●

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

KMG555

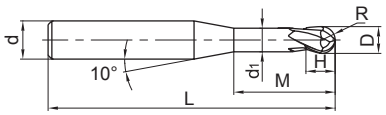
Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
			✔	✔	✔		✔				

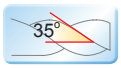
● Ex Stock / ab Lager ○ On demand / auf Anfrage

HM-2BP series for machining high hardness steel · HM-2BP Serie für die Hartbearbeitung

2-flute short cutting edge ball nose micro end mills with straight shank and long neck
2-Schneiden Micro Kugelkopffräser mit kurzer Schneide und Zylinderschaft

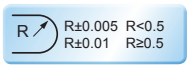








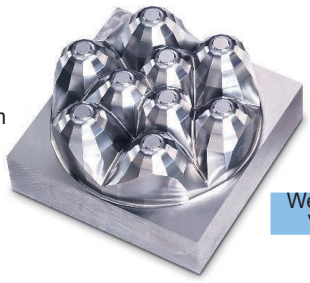






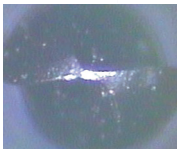
Type · Typ	Dimension(mm) Abmessungen							Teeth · Zähne Z	Grade · Sorte KMG 555
	D	R	H	d1	M	d	L		
HM-2BP-R1.5-M08	3.0	1.5	4.5	2.85	8.0	6.0	50	2	●
HM-2BP-R1.5-M10	3.0	1.5	4.5	2.85	10.0	6.0	50	2	●
HM-2BP-R1.5-M12	3.0	1.5	4.5	2.85	12.0	6.0	50	2	●
HM-2BP-R1.5-M16	3.0	1.5	4.5	2.85	16.0	6.0	60	2	●
HM-2BP-R1.5-M20	3.0	1.5	4.5	2.85	20.0	6.0	60	2	●
HM-2BP-R2.0-M10	4.0	2.0	6.0	3.85	10.0	6.0	60	2	●
HM-2BP-R2.0-M16	4.0	2.0	6.0	3.85	16.0	6.0	60	2	●
HM-2BP-R2.0-M20	4.0	2.0	6.0	3.85	20.0	6.0	60	2	●
HM-2BP-R2.0-M25	4.0	2.0	6.0	3.85	25.0	6.0	60	2	●
HM-2BP-R2.5-M16	5.0	2.5	7.5	4.85	16.0	6.0	60	2	●
HM-2BP-R2.5-M25	5.0	2.5	7.5	4.85	25.0	6.0	70	2	●

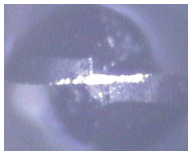
Tool type: HM-2BP-R0.3-M08
Size: R 0.3mm
Workpiece material
Werkstückstoff: S136/52HRC
Rotating/speed: 30000 r/min
Feed: 200 mm/min
Axial cutting depth: Ap=0.02mm
Radial cutting depth: Ae=0.04mm
Cutting style: contour machining (mould of car light)
Cooling system: air blow
Machine: MIKRON HSM 800



End mill Schaftfräser	HM-2BP-R0.3-M08	Similar product of company A
Cutting time Standzeit	300 min	180 min
Wear value Verschleiß	0.025 mm	0.048 mm

Wear condition Verschleiß





Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
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KMG555

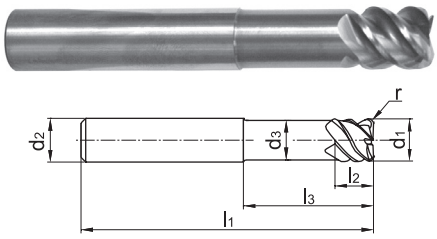
Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
			✔	✔	✔		✔				

Code key B194/196
ISO Kennzeichen
Cutting data B293-368
Schnittdaten
Graphics identification & application B195/197
Graphische Werkzeug- & Anwendungsbeschr.
Order form for non-standard products B373-B372
Bestellformular für Sonderwerkzeuge

ZCC CT 4-flute radius end mills for machining of steel (HRC>48)
ZCC CT 2 Schneiden VHM Schaftfräser mit Eckenradius für die Stahlbearbeitung (HRC>48)

5585R554HHR

KMG405: nano AlTiN Coated Untra-fine carbide /
nano AlTiN beschichtetes Ultrafeinkornhartmetall



Type *Typ*	Dimension(mm) *Abmessungen*							Teeth *Zähne*	Application *Anwendung*	P H
	$d_1(e_8)$	$d_2(h_6)$	l_2	l_1	d_3	l_3	$r_{(+0.03)}$	z	Grade	KMG405
5585R554HHR03-0600	6	6	7	57	5.5	20	0.3	4		●
5585R554HHR15-0600	6	6	7	57	5.5	20	1.5	4		●
5585R554HHR03-0800	8	8	9	63	7.4	26	0.3	4		●
5585R554HHR20-0800	8	8	9	63	7.4	26	2.0	4		●
5585R554HHR05-1000	10	10	11	72	9.2	31	0.5	4		●
5585R554HHR25-1000	10	10	11	72	9.2	31	2.5	4		●
5585R554HHR05-1200	12	12	12	83	11.0	37	0.5	4		●
5585R554HHR30-1200	12	12	12	83	11.0	37	3.0	4		●
5585R554HHR10-1600	16	16	16	92	15.0	43	1.0	4		●
5585R554HHR40-1600	16	16	16	92	15.0	43	4.0	4		●

Art. Group No. / *Produktgruppe Nr.* : 024130

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

KMG405

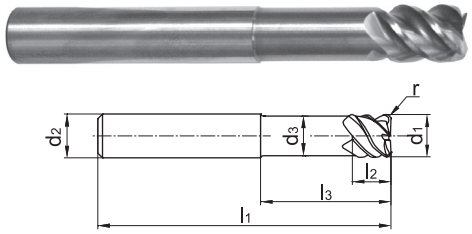
Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
		✔	✔	✔	✔		✔				

● Ex Stock / ab Lager ○ On demand / auf Anfrage

ZCC CT 2-flute ball nose end mills machining high hardness steel (HRC>48)
ZCC CT 2 Schneiden VHM Kugelkopffräser für Hartbearbeitung (HRC>48)

5586R554HHR

KMG405: nano AlTiN Coated Untra-fine carbide /
nano AlTiN beschichtetes Ultrafeinkornhartmetall



Type *Typ*	Dimension(mm) *Abmessungen*							Teeth *Zähne*	Application *Anwendung*	P H
	$d_1(e_8)$	$d_2(h_6)$	l_2	l_1	d_3	l_3	$r_{(+0.03)}$	z	Grade	KMG405
5586R554HHR03-0600	6	6	7	80	5.5	43	0.3	4		●
5586R554HHR15-0600	6	6	7	80	5.5	43	1.5	4		●
5586R554HHR03-0800	8	8	9	90	7.4	53	0.3	4		●
5586R554HHR20-0800	8	8	9	90	7.4	53	2.0	4		●
5586R554HHR05-1000	10	10	11	100	9.2	59	0.5	4		●
5586R554HHR25-1000	10	10	11	100	9.2	59	2.5	4		●
5586R554HHR05-1200	12	12	12	120	11.0	74	0.5	4		●
5586R554HHR30-1200	12	12	12	120	11.0	74	3.0	4		●
5586R554HHR10-1600	16	16	16	140	15.0	91	1.0	4		●
5586R554HHR40-1600	16	16	16	140	15.0	91	4.0	4		●

Art. Group No. / *Produktgruppe Nr.* : 024130

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
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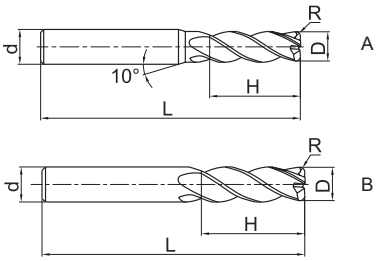
Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
		✔	✔	✔	✔		✔				

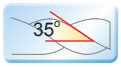
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Cutting data B293-368 Schnittdaten
Graphics identification & application B195/197 Graphische Werkzeug- & Anwendungsbeschr.
Order form for non-standard products B373-B372 Bestellformular für Sonderwerkzeuge

HM-4R series for machining high hardness steel · **HM-4R** Serie für die Hartbearbeitung

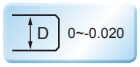
4-flute radius end mills with straight shank
4-Schneiden Radiuseckfräser mit Zylinderschaft













Type · Typ	Dimension(mm) Abmessungen					Teeth · Zähne Z	Geometry Ausführung	Grade · Sorte KMG 555
	D	R	d	H	L			
HM-4R-D3.0R0.2	3.0	0.2	4	8	50	4	A	●
HM-4R-D4.0R0.3	4.0	0.3	4	10	50	4	B	●
HM-4R-D4.0R0.5	4.0	0.5	4	10	50	4	B	●
HM-4R-D5.0R0.5	5.0	0.5	6	13	50	4	A	●
HM-4R-D5.0R1.0	5.0	1.0	6	13	50	4	A	●
HM-4R-D6.0R0.5	6.0	0.5	6	16	50	4	B	●
HM-4R-D6.0R1.0	6.0	1.0	6	16	50	4	B	●
HM-4R-D8.0R0.5	8.0	0.5	8	20	60	4	B	●
HM-4R-D8.0R1.0	8.0	1.0	8	20	60	4	B	●
HM-4R-D10.0R0.5	10.0	0.5	10	25	75	4	B	●
HM-4R-D10.0R1.0	10.0	1.0	10	25	75	4	B	●
HM-4R-D10.0R2.0	10.0	2.0	10	25	75	4	B	●
HM-4R-D10.0R3.0	10.0	3.0	10	25	75	4	B	●
HM-4R-D12.0R0.5	12.0	0.5	12	30	75	4	B	●
HM-4R-D12.0R1.0	12.0	1.0	12	30	75	4	B	●
HM-4R-D12.0R2.0	12.0	2.0	12	30	75	4	B	●
HM-4R-D12.0R3.0	12.0	3.0	12	30	75	4	B	●

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

KMG555

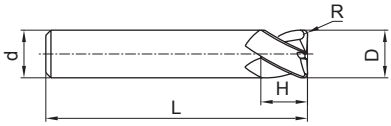
Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
			✔	✔	✔		✔				

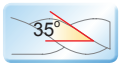
● Ex Stock / ab Lager ○ On demand / auf Anfrage

HM-4RF series for machining high hardness steel · HM-4RF Serie für die Hartbearbeitung

4-flute short cutting edge R end mills with straight shank
4-Schneiden Radiuseckfräser mit kurzer Schneide und Zylinderschaft













Type · Typ	Dimension(mm) Abmessungen					Teeth · Zähne Z	Grade · Sorte KMG 555
	D	R	d	H	L		
HM-4RF-D6.0R0.5	6.0	0.5	6.0	6	50	4	○
HM-4RF-D6.0R1.0	6.0	1.0	6.0	6	50	4	○
HM-4RF-D8.0R0.5	8.0	0.5	8.0	8	60	4	○
HM-4RF-D8.0R1.0	8.0	1.0	8.0	8	60	4	○
HM-4RF-10.0R0.5	10.0	0.5	10.0	10	75	4	○
HM-4RF-D10.0R1.0	10.0	1.0	10.0	10	75	4	○
HM-4RF-D10.0R2.0	10.0	2.0	10.0	10	75	4	○
HM-4RF-D12.0R0.5	12.0	0.5	12.0	12	75	4	○
HM-4RF-D12.0R1.0	12.0	1.0	12.0	12	75	4	○
HM-4RF-D12.0R2.0	12.0	2.0	12.0	12	75	4	○

Material Overview · Material Übersicht

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✔ = Suitable · Empfohlen

KMG555

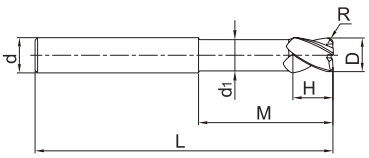
Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
			✔	✔	✔		✔				

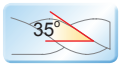
Code key B194/196
ISO Kennzeichen
Cutting data B293-368
Schnittdaten
Graphics identification & application B195/197
Graphische Werkzeug- & Anwendungsbeschr.
Order form for non-standard products B373-B372
Bestellformular für Sonderwerkzeuge

HM-4RP series for machining high hardness steel · HM-4RP Serie für die Hartbearbeitung

4-flute short cutting edge R end mills with straight shank and long neck
4-Schneiden Radiuseckfräser mit kurzer Schneide und Zylinderschaft













Type · Typ	Dimension(mm) Abmessungen							Teeth · Zähne Z	Grade · Sorte KMG 555
	D	R	d	d_1	H	M	L		
HM-4RP-D6.0R0.5	6.0	0.5	6.0	5.8	6.0	18	75	4	○
HM-4RP-D6.0R1.0	6.0	1.0	6.0	5.8	6.0	18	75	4	○
HM-4RP-D8.0R0.5	8.0	0.5	8.0	7.8	8.0	24	100	4	○
HM-4RP-D8.0R1.0	8.0	1.0	8.0	7.8	8.0	24	100	4	○
HM-4RP-10.0R0.5	10.0	0.5	10.0	9.6	10.0	30	100	4	○
HM-4RP-10.0R1.0	10.0	1.0	10.0	9.6	10.0	30	100	4	○
HM-4RP-10.0R2.0	10.0	2.0	10.0	9.6	10.0	30	100	4	○
HM-4RP-12.0R0.5	12.0	0.5	12.0	11.5	12.0	36	100	4	○
HM-4RP-12.0R1.0	12.0	1.0	12.0	11.5	12.0	36	100	4	○
HM-4RP-12.0R2.0	12.0	2.0	12.0	11.5	12.0	36	100	4	○
HM-4RP-D16.0R1.0	16.0	1.0	16.0	15.5	16.0	40	150	4	○
HM-4RP-D16.0R2.0	16.0	2.0	16.0	15.5	16.0	40	150	4	○

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

KMG555

Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
			✔	✔	✔		✔				

● Ex Stock / ab Lager ○ On demand / auf Anfrage

NM series end mills for machining copper
Serie VHM-Fräser für die Kupferbearbeitung

Extremely outstanding NM series end mills, greatly improve the machining performance in copper or copper alloy.

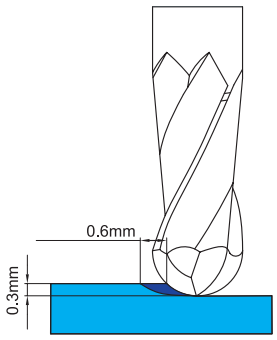
Extrem leistungsstarke NM Schaftfräser , für die wirtschaftliche Bearbeitung von Kupfer und Kupferlegierungen.

- Transcendent sharpness is very suitable for high precision machining copper or copper alloy.
- CrN coating with perfect lubricating property and minimal friction factor, achieves light and fast cutting process, extra long tool life and high surface quality.
- Hervorragende Schneidenschärfe ist besonders geeignet für die Präzisions-Bearbeitung von Kupfer oder Kupferlegierungen.
- Bei Einsatz von Kühlmittel erzeugt die CrN beschichtete Schneidplatte geringste Reibung. Das Ergebnis ist leichte und schnelle Zerpspanung bei besonders langer Werkezeugstandzeit und sehr gute Werkstück Oberflächenqualität.

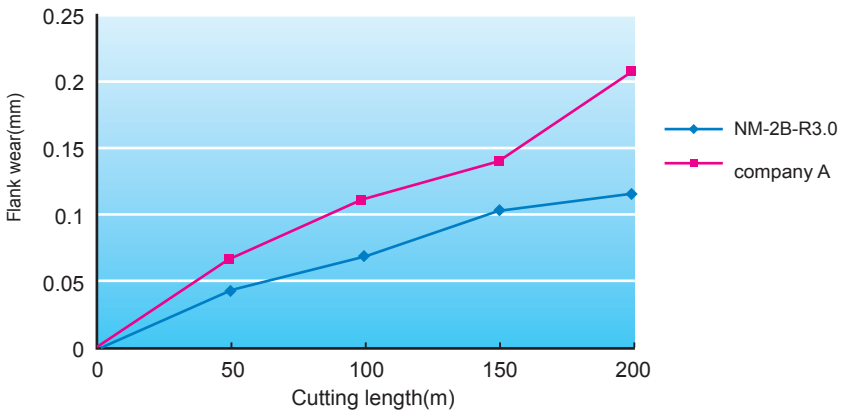
Coating Beschichtung	Micro hardness (hv) Microhärte	Friction factor Bruchfaktor	Initial temperature of oxidation Oxidations temperatur (°C)	Bonding strength with substrate Zähigkeit
CrN	1800	0.25	700	✔
TiN	2200	0.4	500	✔
TiCN	2700	0.3	400	✔
TiAlN	2800	0.3	800	✔

common › excellent

- Tool type: NM-2B-R3.0
- Size: R3.0mm
- Workpiece material · Werkstückstoff: C1100
- Rotating speed: 8000r/min (150m/min)
- Feed: 1200mm/min (0.15mm/r)
- Axial cutting depth: Ap=0.3mm
- Radial cutting depth: Ae=0.6mm
- Cutting style: face milling (down milling)
- Cooling system: air blow
- Machine: MIKRON UCP 1000



■ Ball nose end mills for machining copper alloy
Kugelkopffräser für Kupferbearbeitung



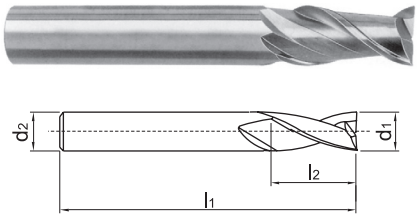
DIN 6527L 2-flute end mills · DIN 6527L 2-Schneiden VHM Schaftfräser

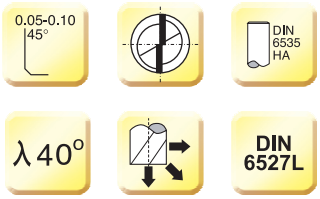


5502R402NM

YK30F: Ultra-fine carbide / *Ultrafeinkornhartmetall*







Type *Typ*	Dimension(mm) *Abmessungen*				Teeth *Zähne*	Application *Anwendung*	N
	$d_1(e_8)$	$d_2(h_6)$	l_2	l_1	z	Grade	YK30F
5502R402NM-0300	3.00	6	8	57	2		●
5502R402NM-0400	4.00	6	11	57	2		●
5502R402NM-0500	5.00	6	13	57	2		●
5502R402NM-0600	6.00	6	13	57	2		●
5502R402NM-0800	8.00	8	19	63	2		●
5502R402NM-1000	10.00	10	22	72	2		●
5502R402NM-1200	12.00	12	26	83	2		●
5502R402NM-1400	14.00	14	26	83	2		●
5502R402NM-1600	16.00	16	32	92	2		●
5502R402NM-1800	18.00	18	32	92	2		●
5502R402NM-2000	20.00	20	38	104	2		●
						Art. Group No. / *Produktgruppe Nr.* :	**021140**

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

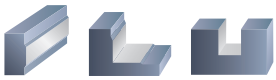
YK 30F

Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
								✔			

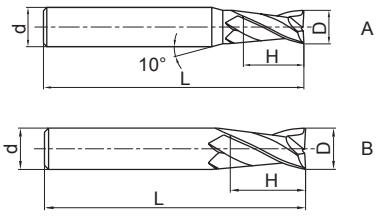
● Ex Stock / ab Lager ○ On demand / auf Anfrage

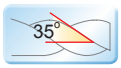
NM-2E series for machining cooper · NM-2E Serie für die Bearbeitung von Kupfer

4-flute end mills with straight shank
4-Schneiden Schaftfräser mit Zylinderschaft

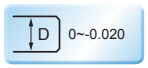














Type · Typ	Dimension(mm) Abmessungen				Teeth · Zähne Z	Geometry Ausführung	Grade · Sorte KMG309
	D	d	H	L			
NM-2E-D1.0	1.0	4	3	50	2	A	○
NM-2E-D2.0	2.0	4	6	50	2	A	○
NM-2E-D3.0	3.0	6	8	50	2	A	○
NM-2E-D4.0	4.0	6	11	50	2	A	○
NM-2E-D5.0	5.0	6	13	50	2	A	○
NM-2E-D6.0	6.0	6	16	50	2	B	○
NM-2E-D8.0	8.0	8	20	60	2	B	○
NM-2E-D10.0	10.0	10	25	75	2	B	○
NM-2E-D12.0	12.0	12	30	75	2	B	○

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
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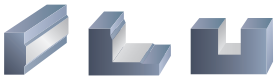
KMG309

Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
								✔			

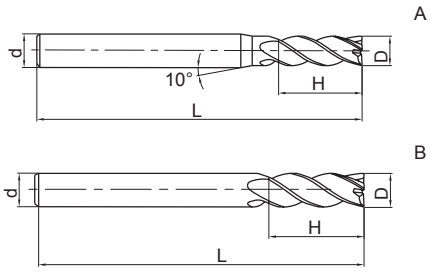
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ISO Kennzeichen
Cutting data B293-368
Schnittdaten
Graphics identification & application B195/197
Graphische Werkzeug- & Anwendungsbeschr.
Order form for non-standard products B373-B372
Bestellformular für Sonderwerkzeuge

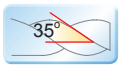
NM-4E series for machining cooper · NM-4E Serie für die Bearbeitung von Kupfer

4-flute end mills with straight shank
4-Schneiden Schaftfräser mit Zylinderschaft

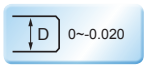














Type · Typ	Dimension(mm) Abmessungen				Teeth · Zähne Z	Geometry Ausführung	Grade · Sorte KMG309
	D	d	H	L			
NM-4E-D3.0	3.0	6	8	50	4	A	○
NM-4E-D4.0	4.0	6	11	50	4	A	○
NM-4E-D5.0	5.0	6	13	50	4	A	○
NM-4E-D6.0	6.0	6	16	50	4	B	○
NM-4E-D8.0	8.0	8	20	60	4	B	○
NM-4E-D10.0	10.0	10	25	75	4	B	○
NM-4E-D12.0	12.0	12	30	75	4	B	○

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✔ = Very suitable · Sehr empfohlen
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KMG309

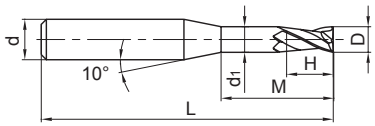
Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
								✔			

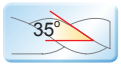
● Ex Stock / ab Lager ○ On demand / auf Anfrage

NM-2EP series for machining cooper · NM-2EP Serie für die Bearbeitung von Kupfer

2-flute short cutting edge end mills with straight shank with long neck
2-Schneiden Schaftfräser mit Zylinderschaft

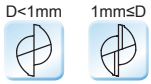












Type · Typ	Dimension(mm) Abmessungen						Teeth · Zähne Z	Grade · Sorte KMG309
	D	d	H	M	d_1	L		
NM-2EP-D0.5-M04	0.5	4.0	0.7	4.0	0.45	50	2	○
NM-2EP-D0.5-M06	0.5	4.0	0.7	6.0	0.45	50	2	○
NM-2EP-D0.5-M08	0.5	4.0	0.7	8.0	0.45	50	2	○
NM-2EP-D0.8-M04	0.8	4.0	1.2	4.0	0.75	50	2	○
NM-2EP-D0.8-M06	0.8	4.0	1.2	6.0	0.75	50	2	○
NM-2EP-D0.8-M08	0.8	4.0	1.2	8.0	0.75	50	2	○
NM-2EP-D0.8-M10	0.8	4.0	1.2	10.0	0.75	50	2	○
NM-2EP-D1.0-M04	1.0	4.0	1.5	4.0	0.95	50	2	○
NM-2EP-D1.0-M06	1.0	4.0	1.5	6.0	0.95	50	2	○
NM-2EP-D1.0-M08	1.0	4.0	1.5	8.0	0.95	50	2	○
NM-2EP-D1.0-M10	1.0	4.0	1.5	10.0	0.95	50	2	○
NM-2EP-D1.0-M12	1.0	4.0	1.5	12.0	0.95	50	2	○
NM-2EP-D1.0-M14	1.0	4.0	1.5	14.0	0.95	50	2	○
NM-2EP-D1.5-M08	1.5	4.0	2.3	8.0	1.45	50	2	○
NM-2EP-D1.5-M16	1.5	4.0	2.3	16.0	1.45	50	2	○
NM-2EP-D2.0-M06	2.0	4.0	3.0	6.0	1.95	50	2	○
NM-2EP-D2.0-M08	2.0	4.0	3.0	8.0	1.95	50	2	○
NM-2EP-D2.0-M10	2.0	4.0	3.0	10.0	1.95	50	2	○
NM-2EP-D2.0-M12	2.0	4.0	3.0	12.0	1.95	50	2	○
NM-2EP-D2.0-M14	2.0	4.0	3.0	14.0	1.95	50	2	○
NM-2EP-D2.0-M16	2.0	4.0	3.0	16.0	1.95	50	2	○
NM-2EP-D2.5-M10	2.5	4.0	3.7	10.0	2.4	50	2	○
NM-2EP-D2.5-M20	2.5	4.0	3.7	20.0	2.4	60	2	○
NM-2EP-D3.0-M10	3.0	6.0	4.5	10.0	2.85	50	2	○
NM-2EP-D3.0-M20	3.0	6.0	4.5	20.0	2.85	60	2	○
NM-2EP-D4.0-M16	4.0	6.0	6.0	16.0	3.85	60	2	○
NM-2EP-D4.0-M25	4.0	6.0	6.0	25.0	3.85	60	2	○
NM-2EP-D5.0-M16	5.0	6.0	7.5	16.0	4.85	60	2	○
NM-2EP-D5.0-M25	5.0	6.0	7.5	25.0	4.85	70	2	○

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

KMG309

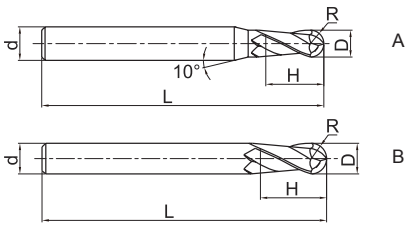
Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
								✔			

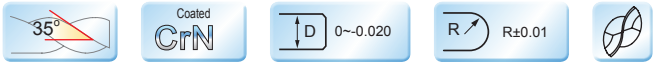
Code key B194/196
ISO Kennzeichen
Cutting data B293-368
Schnittdaten
Graphics identification & application B195/197
Graphische Werkzeug- & Anwendungsbeschr.
Order form for non-standard products B373-B372
Bestellformular für Sonderwerkzeuge

NM-2B series for machining cooper · **NM-2B** Serie für die Bearbeitung von Kupfer

2-flute ball nose mills with straight shank
2-Schneiden Kugelkopffräser mit Zylinderschaft







Type · Typ	Dimension(mm) Abmessungen					Teeth · Zähne Z	Geometry Ausführung	Grade · Sorte KMG309
	D	R	d	H	L			
NM-2B-R0.5	1.0	0.5	4.0	2.0	50	2	A	○
NM-2B-R0.75	1.5	0.75	4.0	3.0	50	2	A	○
NM-2B-R1.0	2.0	1.0	4.0	4.0	50	2	A	○
NM-2B-R1.25	2.5	1.25	4.0	5.0	50	2	A	○
NM-2B-R1.5	3.0	1.5	6.0	6.0	50	2	A	○
NM-2B-R1.75	3.5	1.75	6.0	8.0	50	2	A	○
NM-2B-R2.0	4.0	2.0	6.0	8.0	50	2	A	○
NM-2B-R2.5	5.0	2.5	6.0	10.0	50	2	A	○
NM-2B-R3.0	6.0	3.0	6.0	12.0	50	2	B	○
NM-2B-R4.0	8.0	4.0	8.0	16.0	60	2	B	○
NM-2B-R5.0	10.0	5.0	10.0	20.0	75	2	B	○
NM-2B-R6.0	12.0	6.0	12.0	24.0	75	2	B	○

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

KMG309

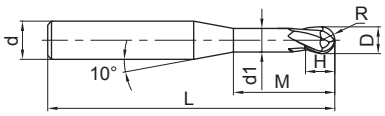
Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
								✔			

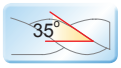
● Ex Stock / ab Lager ○ On demand / auf Anfrage

NM-2BP series for machining cooper · NM-2BP Serie für die Bearbeitung von Kupfer

2-flute short cutting edge ball nose micro end mills with straight shank and long
2-Schneiden Micro Kugelkopffräser, mit kurzer Schneide und Zylinderschaft (lang)

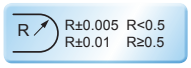














Type · Typ	Dimension(mm) Abmessungen							Teeth · Zähne Z	Grade · Sorte KMG309
	D	R	H	d1	M	d	L		
NM-2BP-R0.25-M04	0.5	0.25	0.7	0.45	4.0	4.0	50	2	○
NM-2BP-R0.25-M06	0.5	0.25	0.7	0.45	6.0	4.0	50	2	○
NM-2BP-R0.3-M04	0.6	0.3	0.9	0.55	4.0	4.0	50	2	○
NM-2BP-R0.3-M06	0.6	0.3	0.9	0.55	6.0	4.0	50	2	○
NM-2BP-R0.3-M08	0.6	0.3	0.9	0.55	8.0	4.0	50	2	○
NM-2BP-R0.4-M04	0.8	0.4	1.2	0.75	4.0	4.0	50	2	○
NM-2BP-R0.4-M06	0.8	0.4	1.2	0.75	6.0	4.0	50	2	○
NM-2BP-R0.4-M08	0.8	0.4	1.2	0.75	8.0	4.0	50	2	○
NM-2BP-R0.4-M10	0.8	0.4	1.2	0.75	10.0	4.0	50	2	○
NM-2BP-R0.5-M04	1.0	0.5	1.5	0.95	4.0	4.0	50	2	○
NM-2BP-R0.5-M06	1.0	0.5	1.5	0.95	6.0	4.0	50	2	○
NM-2BP-R0.5-M08	1.0	0.5	1.5	0.95	8.0	4.0	50	2	○
NM-2BP-R0.5-M10	1.0	0.5	1.5	0.95	10.0	4.0	50	2	○
NM-2BP-R0.5-M12	1.0	0.5	1.5	0.95	12.0	4.0	50	2	○
NM-2BP-R0.75-M08	1.5	0.75	2.3	1.45	8.0	4.0	50	2	○
NM-2BP-R0.75-M16	1.5	0.75	2.3	1.45	16.0	4.0	50	2	○
NM-2BP-R1.0-M06	2.0	1.0	3.0	1.95	6.0	4.0	50	2	○
NM-2BP-R1.0-M08	2.0	1.0	3.0	1.95	8.0	4.0	50	2	○
NM-2BP-R1.0-M10	2.0	1.0	3.0	1.95	10.0	4.0	50	2	○
NM-2BP-R1.0-M12	2.0	1.0	3.0	1.95	12.0	4.0	50	2	○
NM-2BP-R1.0-M16	2.0	1.0	3.0	1.95	16.0	4.0	50	2	○
NM-2BP-R1.0-M20	2.0	1.0	3.0	1.95	20.0	4.0	60	2	○
NM-2BP-R1.5-M10	3.0	1.5	4.5	2.85	10.0	6.0	50	2	○
NM-2BP-R1.5-M20	3.0	1.5	4.5	2.85	20.0	6.0	60	2	○
NM-2BP-R2.0-M10	4.0	2.0	6.0	3.85	10.0	6.0	60	2	○
NM-2BP-R2.0-M16	4.0	2.0	6.0	3.85	16.0	6.0	60	2	○
NM-2BP-R2.0-M20	4.0	2.0	6.0	3.85	20.0	6.0	60	2	○
NM-2BP-R2.0-M25	4.0	2.0	6.0	3.85	25.0	6.0	60	2	○
NM-2BP-R2.5-M16	5.0	2.5	7.5	4.85	16.0	6.0	60	2	○
NM-2BP-R2.5-M25	5.0	2.5	7.5	4.85	25.0	6.0	70	2	○

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

KMG309

Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
								✔			

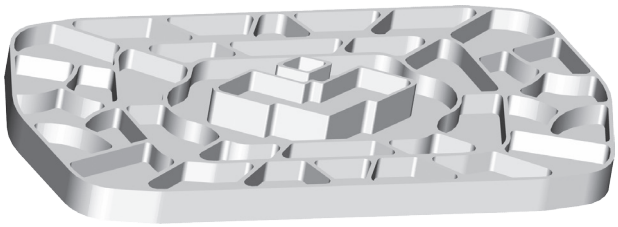
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ISO Kennzeichen
Cutting data B293-368
Schnittdaten
Graphics identification & application B195/197
Graphische Werkzeug- & Anwendungsbeschr.
Order form for non-standard products B373-B372
Bestellformular für Sonderwerkzeuge

AL series end mills for machining aluminum
Serie VHM-Schaftfräser für die Bearbeitung von Aluminium

Completed product category, realize machining Al alloy from general to ultra high speed.

- Tool type: AL-3E-D6.0
- Size: Ø6.0mm
- Workpiece material/ Werkstückstoff: LC4
- Rotating speed: 13000r/min (250m/min)
- Feed: 1950mm/min (0.15mm/r)
- Axial cutting depth: Ap=9.0mm
- Radial cutting depth: Ae=1.0mm
- Cutting style : complicated cavity machining
- Cooling system: air blow
- Machine: MIKRON UCP 1000

Komplettes leistungstarkes Programm, für die Bearbeitung von Alu.-Legierung, unter normalen und äußerst hohen Schnittgeschwindigkeiten.

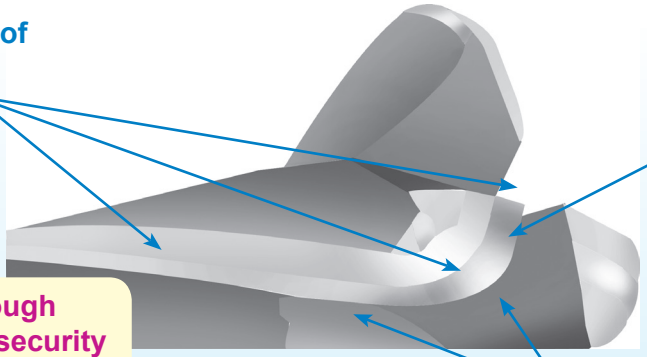


Brand-new AL-2R, AL-2RL, AL-3R, AL-3RL series are released for ultrahigh speed milling aerospace Al alloy.

Brand NEUE Serie AL-2R, AL-2RL, AL-3R, AL-3RL für die Fräsbearbeitung von Aluminium-Legierung für die Luftfahrt mit "high speed" Schnittgeschwindigkeiten.

Anti-vibration design of whole cutting edge

Antivibrations Schneidengeometrie



Wiper benefit to improve surface quality

Wiper Geometrie für hohe Oberflächenqualität.

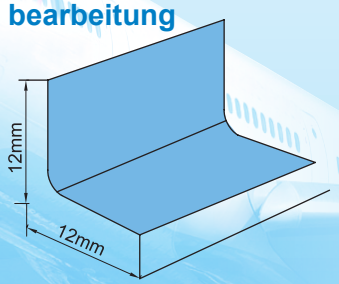
All end mills pass through dynamic balance and security tests.
Alle Fräser sind auf dynamische Balance und Sicherheit getestet worden.

Big chip pocket is suitable for high feed machining

Großer Spanraum für die Spanabfuhr, bei Hochgeschwindigtkeits-bearbeitung

AL-3R ultrahigh speed machining performance

- Tool type: AL-3R-D20.0R3.0-AIR
- Size: Ø20.0mm
- Workpiece materialWerstückm.: A7075
- Cutting speed · Schnittgeschw.: 1500m/min
- Rotating speed: 25000r/min
- Feed rate per tooth: 0.48mm/r
- Feed: 12000mm/min
- Axial cutting depth: Ap=12mm
- Radial cutting depth: Ae=12mm
- Metal removal rate: 1800cm^3/min
- Cutting style: side milling (down milling)
- Cooling system: air blow
- Machine: horizontal machining center

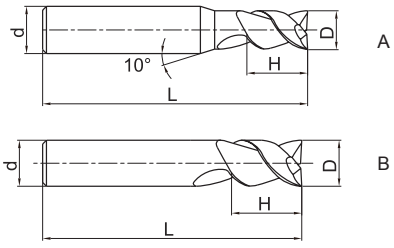


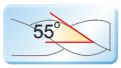
Note: Cutting speed
Schnittgeschw. reach 1500m/min, metal removal rate is 1800cm^3/min

AL-2E series for machining aluminium · AL-2E Serie für die Bearbeitung von Aluminium

2-flute end mills with straight shank
2-Schneiden Schaftfräser mit Zylinderschaft











Type · Typ	Dimension(mm) Abmessungen				Teeth · Zähne Z	Geometry Ausführung	Grade · Sorte YK30F
	D	d	H	L			
AL-2E-D1.0	1.0	4	3	50	2	A	●
AL-2E-D1.5	1.5	4	4	50	2	A	●
AL-2E-D2.0	2.0	4	6	50	2	A	●
AL-2E-D2.5	2.5	4	7	50	2	A	●
AL-2E-D3.0	3.0	6	9	50	2	A	●
AL-2E-D4.0	4.0	6	12	50	2	A	●
AL-2E-D5.0	5.0	6	15	50	2	A	●
AL-2E-D6.0	6.0	6	18	60	2	B	●
AL-2E-D8.0	8.0	8	20	60	2	B	●
AL-2E-D10.0	10.0	10	30	75	2	B	●
AL-2E-D12.0	12.0	12	32	75	2	B	●
AL-2E-D16.0	16.0	16	45	100	2	B	●
AL-2E-D20.0	20.0	20	45	100	2	B	●

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
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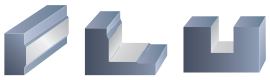
YK 30F

Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
									✔		

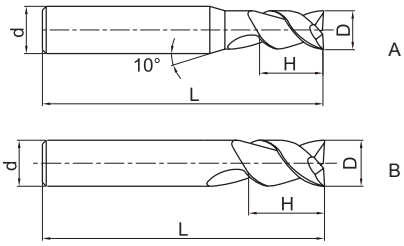
Code key B194/196
ISO Kennzeichen
Cutting data B293-368
Schnittdaten
Graphics identification & application B195/197
Graphische Werkzeug- & Anwendungsbeschr.
Order form for non-standard products B373-B372
Bestellformular für Sonderwerkzeuge

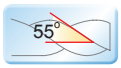
AL-2EL series for machining aluminium · **AL-2EL** Serie für die Bearbeitung von Aluminium

2-flute long cutting edge end mills with straight shank
2-Schneiden Schaftfräser mit langer Schneide und Zylinderschaft













Type · Typ	Dimension(mm) Abmessungen				Teeth · Zähne Z	Geometry Ausführung	Grade · Sorte YK30F
	D	d	H	L			
AL-2EL-D3.0	3.0	6	12	60	2	A	●
AL-2EL-D4.0	4.0	6	16	60	2	A	●
AL-2EL-D5.0	5.0	6	20	60	2	A	●
AL-2EL-D6.0	6.0	6	25	75	2	B	●
AL-2EL-D8.0	8.0	8	32	75	2	B	●
AL-2EL-D10.0	10.0	10	45	100	2	B	●
AL-2EL-D12.0	12.0	12	45	100	2	B	●
AL-2EL-D16.0	16.0	16	65	150	2	B	●
AL-2EL-D20.0	20.0	20	75	150	2	B	●

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

YK 30F

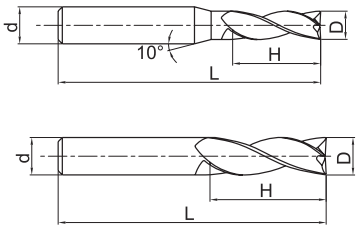
Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
									✔		

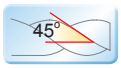
● Ex Stock / ab Lager ○ On demand / auf Anfrage

AL-3E series for machining aluminium · AL-3E Serie für die Bearbeitung von Aluminium

3-flute end mills with straight shank
3-Schneiden Schaftfräser mit Zylinderschaft











Type · Typ	Dimension(mm) Abmessungen				Teeth · Zähne Z	Geometry Ausführung	Grade · Sorte YK30F
	D	d	H	L			
AL-3E-D1.0	1.0	4	3	50	3	A	●
AL-3E-D1.5	1.5	4	4	50	3	A	●
AL-3E-D2.0	2.0	4	6	50	3	A	●
AL-3E-D2.5	2.5	4	7	50	3	A	●
AL-3E-D3.0	3.0	6	9	50	3	A	●
AL-3E-D4.0	4.0	6	12	50	3	A	●
AL-3E-D5.0	5.0	6	15	50	3	A	●
AL-3E-D6.0	6.0	6	18	60	3	B	●
AL-3E-D8.0	8.0	8	20	60	3	B	●
AL-3E-D10.0	10.0	10	30	75	3	B	●
AL-3E-D12.0	12.0	12	32	75	3	B	●
AL-3E-D16.0	16.0	16	45	100	3	B	●
AL-3E-D20.0	20.0	20	45	100	3	B	●

Material Overview · Material Übersicht

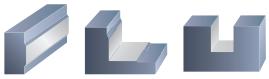
✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

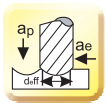
YK 30F

Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
									✔		

Code key B194/196
ISO Kennzeichen
Cutting data B293-368
Schnittdaten
Graphics identification & application B195/197
Graphische Werkzeug- & Anwendungsbeschr.
Order form for non-standard products B373-B372
Bestellformular für Sonderwerkzeuge

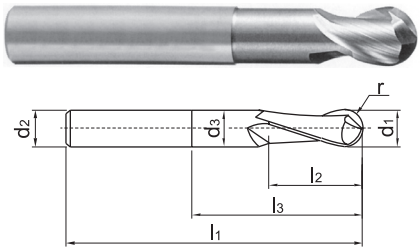
ZCC CT series for machining aluminium · ZCC CT Serie für die Bearbeitung von Aluminium





5565R302NH

YK40F: Ultrafine carbide / *Ultrafeinkornhartmetall*





Type *Typ*	Dimension(mm) *Abmessungen*								Teeth *Zähne*	Application *Anwendung*	N
	d_1	$d_2(h_6)$	l_2	l_1	D_3	l_3	$r(f_8)$	α°	z	Grade	YK40F
5565R302NH-0300	3.00	6	6	57	2.80	9	1.50	6	2		●
5565R302NH-0400	4.00	6	8	57	3.70	12	2.00	4	2		●
5565R302NH-0500	5.00	6	10	57	4.60	15	2.50	2	2		●
5565R302NH-0600	6.00	6	12	57	5.50	20	3.00		2		●
5565R302NH-0800	8.00	8	16	63	7.40	26	4.00		2		●
5565R302NH-1000	10.00	10	20	72	9.20	31	5.00		2		●
5565R302NH-1200	12.00	12	24	83	11.00	37	6.00		2		●
5565R302NH-1600	16.00	16	32	92	15.00	43	8.00		2		●

Art. Group No. / *Produktgruppe Nr.* : **023140**

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

YK40F

Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
									✔		

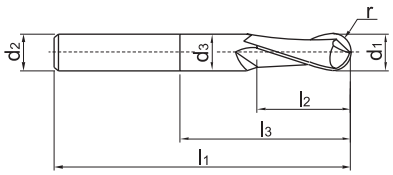
● Ex Stock / ab Lager ○ On demand / auf Anfrage

ZCC CT series for machining aluminium · ZCC CT Serie für die Bearbeitung von Aluminium

5566R302NH

YK40F: Ultrafine carbide / *Ultrafeinkornhartmetall*





DIN 6535 HA

λ 30°

ZCCCT NORM

Type *Typ*	Dimension(mm) *Abmessungen*								Teeth *Zähne*	Application *Anwendung*	N
	d_1	$d_2(h_6)$	l_2	l_1	d_3	l_3	$r(f_8)$	α°	z	Grade	YK40F
5566R302NH-0300	3.00	6	6	75	2.80	9	1.50	6	2		●
5566R302NH-0400	4.00	6	8	75	3.70	12	2.00	4	2		●
5566R302NH-0500	5.00	6	10	80	4.60	15	2.50	2	2		●
5566R302NH-0600	6.00	6	12	80	5.50	20	3.00		2		●
5566R302NH-0800	8.00	8	16	90	7.40	26	4.00		2		●
5566R302NH-1000	10.00	10	20	100	9.20	31	5.00		2		●
5566R302NH-1200	12.00	12	24	120	11.00	37	6.00		2		●
5566R302NH-1600	16.00	16	32	140	15.00	43	8.00		2		●

Art. Group No. / *Produktgruppe Nr.* : 023140

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

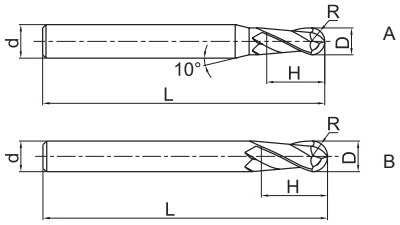
Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
									✔		

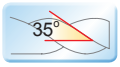
Code key B194/196 ISO Kennzeichen
Cutting data B293-368 Schnittdaten
Graphics identification & application B195/197 Graphische Werkzeug- & Anwendungsbeschr.
Order form for non-standard products B373-B372 Bestellformular für Sonderwerkzeuge

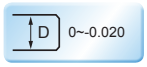
AL-2B series for machining aluminium · **AL-2B** Serie für die Bearbeitung von Aluminium

2-flute ball nose end mills with straight shank
2-Schneiden Kugelkopffräser mit Zylinderschaft













Type · Typ	Dimension(mm) Abmessungen					Teeth · Zähne Z	Geometry Ausführung	Grade · Sorte YK30F
	D	R	d	H	L			
AL-2B-R1.0	2.0	1.0	6.0	4.0	60	2	A	○
AL-2B-R1.5	3.0	1.5	6.0	6.0	60	2	A	○
AL-2B-R2.0	4.0	2.0	6.0	8.0	60	2	A	○
AL-2B-R2.5	5.0	2.5	6.0	10.0	60	2	A	○
AL-2B-R3.0	6.0	3.0	6.0	12.0	60	2	B	○
AL-2B-R4.0	8.0	4.0	8.0	16.0	75	2	B	○
AL-2B-R5.0	10.0	5.0	10.0	20.0	75	2	B	○
AL-2B-R6.0	12.0	6.0	12.0	24.0	75	2	B	○

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

YK 30F

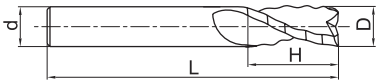
Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
									✔		

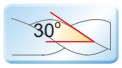
● Ex Stock / ab Lager ○ On demand / auf Anfrage

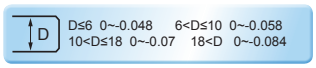
AL-3W series for machining aluminium · AL-3W Serie für die Bearbeitung von Aluminium

3-flute rough end mills with straight shank, rough pitch form
3-Schneiden Schruppfräser mit Zylinderschaft, grobe verzahnt











Type · Typ	Dimension(mm) Abmessungen				Teeth · Zähne Z	Grade · Sorte YK30F
	D	d	H	L		
AL-3W-D6.0	6	6	16	50	3	●
AL-3W-D8.0	8	8	20	60	3	●
AL-3W-D10.0	10	10	25	75	3	●
AL-3W-D12.0	12	12	30	75	3	●
AL-3W-D16.0	16	16	45	100	3	●
AL-3W-D20.0	20	20	45	100	3	●

Material Overview · Material Übersicht

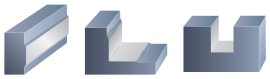
✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

YK 30F

Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
									✔		

Code key B194/196
ISO Kennzeichen
Cutting data B293-368
Schnittdaten
Graphics identification & application B195/197
Graphische Werkzeug- & Anwendungsbeschr.
Order form for non-standard products B373-B372
Bestellformular für Sonderwerkzeuge

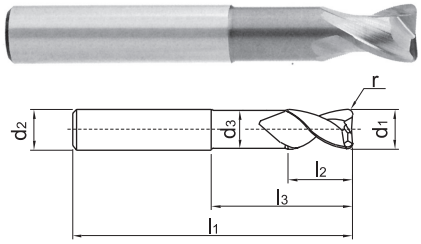
ZCC CT series for machining aluminium · ZCC CT Serie für die Bearbeitung von Aluminium





5585R302NHR

YK40F: Ultrafine carbide / *Ultrafeinkornhartmetall*





Type *Typ*	Dimension(mm) *Abmessungen*							Teeth *Zähne*	Application *Anwendung*	N	
	$d_1(e_8)$	$d_2(h_6)$	l_2	l_1	d_3	l_3	$r_{(+0.03)}$	z	Grade	KMG405	YK40F
5585R302NHR10-0600	6.00	6	7	57	5.50	20	1.00	2		○	●
5585R302NHR10-0800	8.00	8	9	63	7.40	26	1.00	2		○	●
5585R302NHR15-1000	10.00	10	11	72	9.20	31	1.50	2		○	●
5585R302NHR15-1200	12.00	12	12	83	11.00	37	1.50	2		○	●
5585R302NHR20-1600	16.00	16	16	92	15.00	43	2.00	2		○	●
5585R302NHR20-2000	20.00	20	20	104	19.00	53	2.00	2		○	●
Art. Group No. / *Produktgruppe Nr.* :											**023140**

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

YK 40F

Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
									✔		

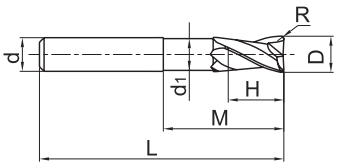
● Ex Stock / ab Lager ○ On demand / auf Anfrage

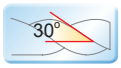
AL-2R series for machining aluminium · **AL-2R** Serie für die Bearbeitung von Aluminium

3-flute end mills with straight shank
3-Schneiden Schaftfräser mit Zylinderschaft

Ultrahigh speed HSC











Type · Typ	Dimension(mm) Abmessungen							Teeth · Zähne Z	Grade · Sorte YK30F
	D	R	d	d_1	H	M	L		
AL-2R-D6.0R1.0- AIR	6	1.0	6	5.5	7	20	57	2	○
AL-2R-D8.0R1.0- AIR	8	1.0	8	7.4	9	26	63	2	○
AL-2R-D10.0R1.0- AIR	10	1.0	10	9.2	11	31	72	2	○
AL-2R-D10.0R2.0- AIR	10	2.0	10	9.2	11	31	72	2	○
AL-2R-D12.0R1.0- AIR	12	1.0	12	11	12	37	83	2	○
AL-2R-D12.0R2.0- AIR	12	2.0	12	11	12	37	83	2	○
AL-2R-D12.0R3.0- AIR	12	3.0	12	11	12	37	83	2	○
AL-2R-D16.0R1.0- AIR	16	1.0	16	15	16	43	92	2	○
AL-2R-D16.0R2.0- AIR	16	2.0	16	15	16	43	92	2	○
AL-2R-D16.0R3.0- AIR	16	3.0	16	15	16	43	92	2	○
AL-2R-D16.0R4.0- AIR	16	4.0	16	15	16	43	92	2	○
AL-2R-D20.0R1.0- AIR	20	1.0	20	19	20	53	104	2	○
AL-2R-D20.0R2.0- AIR	20	2.0	20	19	20	53	104	2	○
AL-2R-D20.0R3.0- AIR	20	3.0	20	19	20	53	104	2	○
AL-2R-D20.0R4.0- AIR	20	4.0	20	19	20	53	104	2	○
AL-2R-D20.0R5.0- AIR	20	5.0	20	19	20	53	104	2	○
AL-2R-D20.0R6.0- AIR	20	6.0	20	19	20	53	104	2	○

for air space industry · für Luft- und Raumfahrt Industrie

Material Overview · Material Übersicht

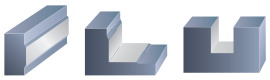
✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

YK 30F

Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
									✔		

Code key B194/196
ISO Kennzeichen
Cutting data B293-368
Schnittdaten
Graphics identification & application B195/197
Graphische Werkzeug- & Anwendungsbeschr.
Order form for non-standard products B373-B372
Bestellformular für Sonderwerkzeuge

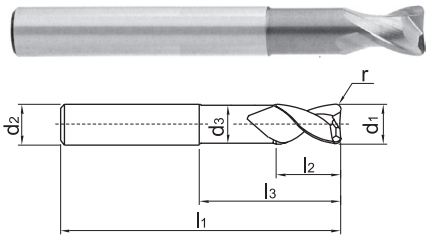
ZCC CT series for machining aluminium · **ZCC CT** Serie für die Bearbeitung von Aluminium





5586R302NHR

YK40F: Ultrafine carbide/ *Ultrafeinkornhartmetall*
KMG405: nano AlTiN Coated Untra-fine carbide / *nano AlTiN beschichtetes Ultrafeinkornhartmetall*





Type *Typ*	Dimension(mm) *Abmessungen*							Teeth *Zähne*	Application *Anwendung*	N	
	$d_1(e_8)$	$d_2(h_6)$	l_2	l_1	d_3	l_3	$r_{(+0.03)}$	z	Grade	KMG405	YK40F
5586R302NHR10-0600	6.00	6	7	80	5.50	43	1.00	2		○	●
5586R302NHR10-0800	8.00	8	9	90	7.40	53	1.00	2		○	●
5586R302NHR15-1000	10.00	10	11	100	9.20	59	1.50	2		○	●
5586R302NHR15-1200	12.00	12	12	120	11.00	74	1.50	2		○	●
5586R302NHR20-1600	16.00	16	16	140	15.00	84	2.00	2		○	●
5586R302NHR20-2000	20.00	20	20	140	19.00	89	2.00	2		○	●
									Art. Group No. / *Produktgruppe Nr.* :		023140

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

YK 40F

Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
									✔		

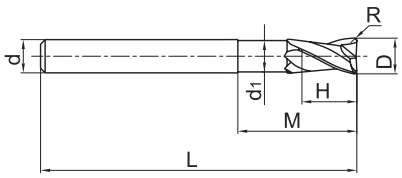
● Ex Stock / ab Lager ○ On demand / auf Anfrage

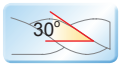
AL-2RL series for machining aluminium · AL-2RL Serie für die Bearbeitung von Aluminium

2-flute radius end mills with long straight shank
2-Schneiden Radiusfräser mit langem Zylinderschaft

Ultrahigh speed HSC











Type · Typ	Dimension(mm) Abmessungen							Teeth · Zähne Z	Grade · Sorte YK40F
	D	R	d	d_1	H	M	L		
AL-2RL-D6.0R1.0- AIR	6	1.0	6	5.5	7	43	80	2	○
AL-2RL-D8.0R1.0- AIR	8	1.0	8	7.4	9	53	90	2	○
AL-2RL-D10.0R1.0- AIR	10	1.0	10	9.2	11	59	100	2	○
AL-2RL-D10.0R2.0- AIR	10	2.0	10	9.2	11	59	100	2	○
AL-2RL-D12.0R1.0- AIR	12	1.0	12	11	12	74	120	2	○
AL-2RL-D12.0R2.0- AIR	12	2.0	12	11	12	74	120	2	○
AL-2RL-D12.0R3.0- AIR	12	3.0	12	11	12	74	120	2	○
AL-2RL-D16.0R1.0- AIR	16	1.0	16	15	16	84	140	2	○
AL-2RL-D16.0R2.0- AIR	16	2.0	16	15	16	84	140	2	○
AL-2RL-D16.0R3.0- AIR	16	3.0	16	15	16	84	140	2	○
AL-2RL-D16.0R4.0- AIR	16	4.0	16	15	16	84	140	2	○
AL-2RL-D20.0R1.0- AIR	20	1.0	20	19	20	89	140	2	○
AL-2RL-D20.0R2.0- AIR	20	2.0	20	19	20	89	140	2	○
AL-2RL-D20.0R3.0- AIR	20	3.0	20	19	20	89	140	2	○
AL-2RL-D20.0R4.0- AIR	20	4.0	20	19	20	89	140	2	○
AL-2RL-D20.0R5.0- AIR	20	5.0	20	19	20	89	140	2	○
AL-2RL-D20.0R6.0- AIR	20	6.0	20	19	20	89	140	2	○

for air space industry · für Luft- und Raumfahrt Industrie

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

YK 40F

Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
									✔		

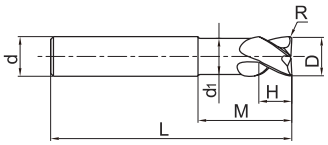
Code key B194/196
ISO Kennzeichen
Cutting data B293-368
Schnittdaten
Graphics identification & application B195/197
Graphische Werkzeug- & Anwendungsbeschr.
Order form for non-standard products B373-B372
Bestellformular für Sonderwerkzeuge

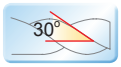
AL-3R series for machining aluminium · **AL-3R** Serie für die Bearbeitung von Aluminium

3-flute radius end mills with straight shank
3-Schneiden Radiusfräser mit langem Zylinderschaft

Ultrahigh speed











Type · Typ	Dimension(mm) Abmessungen							Teeth · Zähne Z	Grade · Sorte YK40F
	D	R	d	d_1	H	M	L		
AL-3R-D12.0R1.0- AIR	12	1.0	12	11	12	37	83	3	○
AL-3R-D12.0R2.0- AIR	12	2.0	12	11	12	37	83	3	○
AL-3R-D12.0R3.0- AIR	12	3.0	12	11	12	37	83	3	○
AL-3R-D16.0R1.0- AIR	16	1.0	16	15	16	43	92	3	○
AL-3R-D16.0R2.0- AIR	16	2.0	16	15	16	43	92	3	○
AL-3R-D16.0R3.0- AIR	16	3.0	16	15	16	43	92	3	○
AL-3R-D16.0R4.0- AIR	16	4.0	16	15	16	43	92	3	○
AL-3R-D20.0R1.0- AIR	20	1.0	20	19	20	53	104	3	○
AL-3R- D20.0R2.0- AIR	20	2.0	20	19	20	53	104	3	○
AL-3R- D20.0R3.0- AIR	20	3.0	20	19	20	53	104	3	○
AL-3R-D20.0R4.0- AIR	20	4.0	20	19	20	53	104	3	○
AL-3R- D20.0R5.0- AIR	20	5.0	20	19	20	53	104	3	○
AL-3R- D20.0R6.0- AIR	20	6.0	20	19	20	53	104	3	○

for air space industry · für Luft- und Raumfahrt Industrie

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

YK 40F

Workpiece material Werkstückstoff										
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
									✔		

● Ex Stock / ab Lager ○ On demand / auf Anfrage

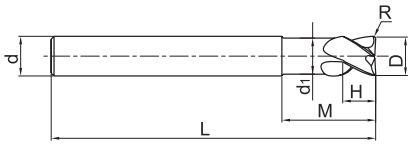
AL-3RL series for machining aluminium · AL-3RL Serie für die Bearbeitung von Aluminium

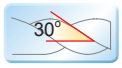
3-flute radius end mills with long straight shank
3-Schneiden Radiusfräser mit langem Zylinderschaft



Ultrahigh speed HSC











Type · Typ	Dimension(mm) Abmessungen							Teeth · Zähne Z	Grade · Sorte YK40F
	D	R	d	d_1	H	M	L		
AL-3RL-D12.0R1.0- AIR	12	1.0	12	11	12	74	120	3	○
AL-3RL-D12.0R2.0- AIR	12	2.0	12	11	12	74	120	3	○
AL-3RL-D12.0R3.0- AIR	12	3.0	12	11	12	74	120	3	○
AL-3RL-D16.0R1.0- AIR	16	1.0	16	15	16	84	140	3	○
AL-3RL-D16.0R2.0- AIR	16	2.0	16	15	16	84	140	3	○
AL-3RL-D16.0R3.0- AIR	16	3.0	16	15	16	84	140	3	○
AL-3RL-D16.0R4.0- AIR	16	4.0	16	15	16	84	140	3	○
AL-3RL-D20.0R1.0- AIR	20	1.0	20	19	20	89	140	3	○
AL-3RL- D20.0R2.0- AIR	20	2.0	20	19	20	89	140	3	○
AL-3RL- D20.0R3.0- AIR	20	3.0	20	19	20	89	140	3	○
AL-3RL-D20.0R4.0- AIR	20	4.0	20	19	20	89	140	3	○
AL-3RL- D20.0R5.0- AIR	20	5.0	20	19	20	89	140	3	○
AL-3RL- D20.0R6.0- AIR	20	6.0	20	19	20	89	140	3	○

for air space industry · für Luft- und Raumfahrt Industrie

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

YK 40F

Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
									✔		

Code key B194/196
ISO Kennzeichen
Cutting data B293-368
Schnittdaten
Graphics identification & application B195/197
Graphische Werkzeug- & Anwendungsbeschr.
Order form for non-standard products B373-B372
Bestellformular für Sonderwerkzeuge

SM

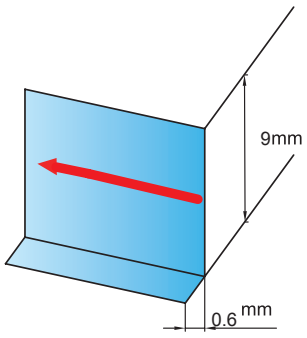
serie solid carbide end mills for machining of stainless steel, heat-resitant alloy and difficult to machine materials.

Serie Vollhartmetallschaftfräser für die Bearbeitung von rostfreien Stählen, warmfesten Legierungen schwerzerspanbaren Materialien.

- Large helical and rake angle, sharp cutting edge, unique edge geometry
- The coating with good heat resistance can achieve stable machining even at high temperature.
- Very suitable for machining of stainless steel, heat resist. super alloy and difficult to machine materials.

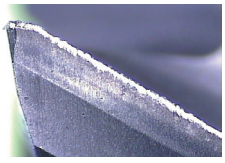
- Großer Spiral und Spanwinkel, Scharfe Schneidkante, einzigartige Schneidengeometrie.
- Die wärmebeständige Beschichtung ist die Basis für eine effiziente Bearbeitung, besonders bei hohen Temperaturen.
- Besonders zu empfehlen für die Bearbeitung von rostfreiem Stählen, warmfesten Legierungen und schwerzerpsanbare Materialien.

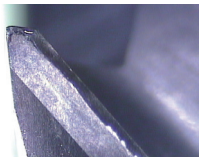
- Tool type: SM-3E-D6.0
- Size: Ø6mm
- Workpiece material · Werkstückstoff: 1Cr18Ni9Ti
- Rotating/ Speed: 3700 r/min (70m/min)
- Feed: 555mm/min (0.15mm/r)
- Axial cutting depth: Ap=9mm
- Radial cutting depth: Ae=0.6mm
- Cutting style: side milling (down milling)
- Cooling system: emulsion
- Machine: MIKRON UCP 1000



End mills/ Schaftfräser	SM-3E-D6.0	Similar product of company A
Cutting length/ Schnittlänge	100m	100m
Wear of peripheral edge Verschleiß	Even wear on cutting edge, value is 0.08 mm Leichterverschleiß auf der Schneidkante	Cutting edge is flaked fully, value is 0.135mm Ausbrüche auf der Schneidkante

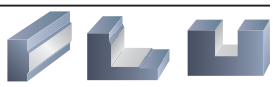
Wear condition of peripheral edge
Verschleiß



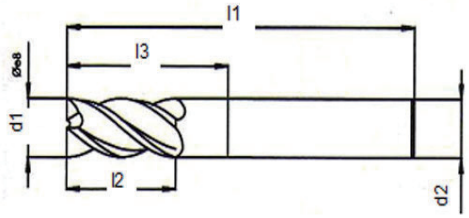


VSM-4E series for difficult to machining · VSM-4E Serie für von schwerzersp. Material

4-flute end mills with straight shank and long cutting edge
4-Schneiden Eckfräser mit langer Schneide und Zylinderschaft







38/41°

Coated
TiAlN

D D≤12 0~-0.020
12<D 0~-0.030

Type · Typ	Dimension(mm) Abmessungen				Teeth · Zähne Z	Grade · Sorte KMG 405
	D	d	H	L		
VSM-4E-D4.0	4	6	11	50	4	●
VSM-4E-D5.0	5	6	13	50	4	●
VSM-4E-D6.0	6	6	16	50	4	●
VSM-4E-D8.0	8	8	20	60	4	●
VSM-4E-D10.0	10	10	25	75	4	●
VSM-4E-D12.0	12	12	30	75	4	●
VSM-4E-D16.0	16	16	45	100	4	●
VSM-4E-D20.0	20	20	45	100	4	●

- Unique geometry design with 38°/41° helix angle in optimal combination of top grade, KMG 405.
- Suitable for roughing and finishing of heat resistance super alloy, TI-alloy and stainless steel.
- Effective milling with higher feed rate and bigger cutting depth.
- Quiet machining without vibration.
- Long tool life and good surface finishing.

- Einzigartige Geometry mit ungleichem Spiralwinkel (38°/41°), in Kombination mit einer hervoragenden Sorte die KMG 405.
- Geeignet zur Schrupp- und Schlichtbearbeitung von warmfeste Legierungen, TI-Leg. und rostfreiem Stahl.
- Effektive Fräsbearbeitung mit höhren Vorschüben und größeren Schnitttiefen.
- Ruhige Bearbeitung ohne Vibrationen.
- Höhere Standzeit und bessere Oberflächenqualität.

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

KMG405

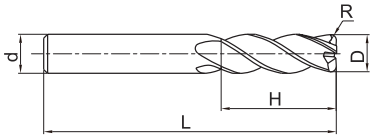
Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
✔	✔					✔				✔	✔

Code key B194/196
ISO Kennzeichen
Cutting data B293-368
Schnittdaten
Graphics identification & application B195/197
Graphische Werkzeug- & Anwendungsbeschr.
Order form for non-standard products B373-B372
Bestellformular für Sonderwerkzeuge

SM-4R series for difficult to machining · SM-4R Serie für von schwerzersp. Material

4-flute R end mills with straight shank
4-Schneiden Radiusfräser mit Zylinderschaft





45° | Coated Nano-AlTiN | D D≤12 0~-0.020 12<D 0~-0.030

Type · Typ	Dimension(mm) Abmessungen					Teeth · Zähne Z	Grade · Sorte KMG 405
	D	R	d	H	L		
SM-4R-D6.0R0.5	6.0	0.5	6	16	50	4	○
SM-4R-D6.0R1.0	6.0	1.0	6	16	50	4	○
SM-4R-D8.0R0.5	8.0	0.5	8	20	60	4	○
SM-4R-D8.0R1.0	8.0	1.0	8	20	60	4	○
SM-4R-D10.0R0.5	10.0	0.5	10	25	75	4	○
SM-4R-D10.0R1.0	10.0	1.0	10	25	75	4	○
SM-4R-D12.0R0.5	12.0	0.5	12	30	75	4	○
SM-4R-D12.0R1.0	12.0	1.0	12	30	75	4	○

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

KMG405

Workpiece material Werkstückstoff											
Carbon steel Kohlenstoff. Stahl	Alloy steel Legierter Stahl	Hardened steel · gehärteter Stahl				Stainless steel · Rostfreier Stahl	Cast iron, Nodular cast iron Grauguss GGG	Copper alloy Kupfer Leg.	Aluminum alloy Alu. Leg.	Titanium alloy Titan Leg.	Heat resist. alloy Warmfeste Leg.
		~40HRC	~50HRC	~60HRC	~68HRC						
✔	✔					✔				✔	✔

● Ex Stock / ab Lager ○ On demand / auf Anfrage

Recommended cutting data · Empfohlene Schnittdaten

Type *Typ*	Grade *Sorte*	Material *Werkstoffe*		d_1 (mm)	z	Vc (m/min)	f_z (mm/z)	a_p (mm)	a_e (mm)	n (min^{-1})	V_f (mm/min)
5501R302GM	YK30F	K	Cast iron *Guss*	3.00	2	60	0.010	1.50	3.00	6360	127
				4.00	2	60	0.015	2.00	4.00	4770	143
				5.00	2	60	0.020	2.50	5.00	3810	152
				6.00	2	60	0.024	3.00	6.00	3180	153
				8.00	2	60	0.032	4.00	8.00	2380	152
				10.00	2	60	0.038	5.00	10.00	1900	144
				12.00	2	60	0.046	6.00	12.00	1590	146
				16.00	2	60	0.054	8.00	16.00	1190	129
				20.00	2	60	0.066	10.00	20.00	950	125
		N	Aluminum alloy *Alu-Legierung* Si<=10%	3.00	2	220	0.010	1.50	3.00	23340	467
				4.00	2	220	0.015	2.00	4.00	17500	525
				5.00	2	220	0.020	2.50	5.00	14000	560
				6.00	2	220	0.024	3.00	6.00	11670	560
				8.00	2	220	0.032	4.00	8.00	8750	560
				10.00	2	220	0.038	5.00	10.00	7000	532
				12.00	2	220	0.046	6.00	12.00	5830	536
				16.00	2	220	0.054	8.00	16.00	4370	472
				20.00	2	220	0.066	10.00	20.00	3500	462
			Brass Bronze *Kupfer*	3.00	2	90	0.010	1.50	3.00	9540	191
				4.00	2	90	0.015	2.00	4.00	7160	215
				5.00	2	90	0.020	2.50	5.00	5720	229
				6.00	2	90	0.024	3.00	6.00	4770	229
				8.00	2	90	0.032	4.00	8.00	3580	229
				10.00	2	90	0.038	5.00	10.00	2860	217
				12.00	2	90	0.046	6.00	12.00	2380	219
				16.00	2	90	0.054	8.00	16.00	1790	193
				20.00	2	90	0.066	10.00	20.00	1430	189





- Please start a test cutting with 85% of the Vc or 75% of the fz, then increase the cutting speed and feed rate.
- Please use high precision and high rigidity clamping system. The oscillation of the tool can not be over 0.01 mm.
- When $a_p=1*d_1$, f_z =75% as the data in the table

- Bitte führen Sie einen Testschnitt mit 85% der Vc und 75% des fz durch.
Nach erfolgtem Test können Sie die Schnittgeschwindigkeit bzw. die Vorschubwerte entsprechend erhöhen.
- Bitte verwenden Sie nur Spannmittel mit einer hohen Genauigkeit und einer hohen Spannkraft.
Überprüfen Sie den Rundlauf der Werkzeuge. Sie sollten darauf achten, dass der Rundlauffehler nicht größer als 0.01mm ist.
- Bei Fräsoperationen, die mit einer $a_p=1*d_1$ durchgeführt werden, ist f_z um 25% zu reduzieren.

Recommended cutting data · Empfohlene Schnittdaten

Type *Typ*	Grade *Sorte*		Material *Werkstoffe*	d_1 (mm)	z	Vc (m/min)	f_z (mm/z)	a_p (mm)	a_e (mm)	n (min^{-1})	V_f (mm/min)
5501R302GM	KMG303	P	Steel *Stahl* HRC<25	3.00	2	105	0.010	1.50	3.00	11140	223
5601R302GM	KMG303			4.00	2	105	0.015	2.00	4.00	8350	251
				5.00	2	105	0.020	2.50	5.00	6680	267
				6.00	2	105	0.024	3.00	6.00	5570	267
				8.00	2	105	0.032	4.00	8.00	4170	267
				10.00	2	105	0.038	5.00	10.00	3340	254
				12.00	2	105	0.046	6.00	12.00	2780	256
				16.00	2	105	0.054	8.00	16.00	2080	225
				20.00	2	105	0.066	10.00	20.00	1670	220
		P	Steel, Steel alloy *Stahl, legierter Stahl* HRC=25-38	3.00	2	75	0.010	1.50	3.00	7950	159
				4.00	2	75	0.015	2.00	4.00	5960	179
				5.00	2	75	0.020	2.50	5.00	4770	191
				6.00	2	75	0.024	3.00	6.00	3970	191
				8.00	2	75	0.032	4.00	8.00	2980	191
				10.00	2	75	0.038	5.00	10.00	2380	181
				12.00	2	75	0.046	6.00	12.00	1980	182
				16.00	2	75	0.054	8.00	16.00	1490	161
				20.00	2	75	0.066	10.00	20.00	1190	157
		P	High ally steel *Hochlegierter Stahl*	3.00	2	40	0.010	1.50	3.00	4240	85
				4.00	2	40	0.010	2.00	4.00	3180	64
				5.00	2	40	0.014	2.50	5.00	2540	71
		M	Stainless steel *Rostfreier Stahl*	6.00	2	40	0.017	3.00	6.00	2120	72
				8.00	2	40	0.024	4.00	8.00	1590	76
				10.00	2	40	0.030	5.00	10.00	1270	76
		S	Ti and Ti alloys *Ti-Legierungen*	12.00	2	40	0.036	6.00	12.00	1060	76
				16.00	2	40	0.045	8.00	16.00	790	71
				20.00	2	40	0.057	10.00	20.00	630	72
		K	Cast iron *Guss*	3.00	2	120	0.010	1.50	3.00	12730	255
				4.00	2	120	0.015	2.00	4.00	9540	286
				5.00	2	120	0.020	2.50	5.00	7630	305
				6.00	2	120	0.024	3.00	6.00	6360	305
				8.00	2	120	0.032	4.00	8.00	4770	305
				10.00	2	120	0.038	5.00	10.00	3810	290
				12.00	2	120	0.046	6.00	12.00	3180	293
				16.00	2	120	0.054	8.00	16.00	2380	257
				20.00	2	120	0.066	10.00	20.00	1900	251
		N	Aluminum alloy *Alu-Legierung* Si<=10%	3.00	2	220	0.010	1.50	3.00	23340	467
				4.00	2	220	0.015	2.00	4.00	17500	525
				5.00	2	220	0.020	2.50	5.00	14000	560
				6.00	2	220	0.024	3.00	6.00	11670	560
				8.00	2	220	0.032	4.00	8.00	8750	560
				10.00	2	220	0.038	5.00	10.00	7000	532
				12.00	2	220	0.046	6.00	12.00	5830	536
				16.00	2	220	0.054	8.00	16.00	4370	472
				20.00	2	220	0.066	10.00	20.00	3500	462
		N	Brass Bronze *Kupfer*	3.00	2	90	0.010	1.50	3.00	9540	191
				4.00	2	90	0.015	2.00	4.00	7160	215
				5.00	2	90	0.020	2.50	5.00	5720	229
				6.00	2	90	0.024	3.00	6.00	4770	229
				8.0	2	90	0.032	4.00	8.00	3580	229
				10.00	2	90	0.038	5.00	10.00	2860	217
				12.00	2	90	0.046	6.00	12.00	2380	219
				16.00	2	90	0.054	8.00	16.00	1790	193
				20.00	2	90	0.066	10.00	20.00	1430	189





- Please start a test cutting with 85% of the Vc or 75% of the f_z, then increase the cutting speed and feed rate.
- Please use high precision and high rigidity clamping system. The oscillation of the tool cannot be over 0.01 mm.
- When $a_p=1*d_1$, f_z =75% as the data in the table

- *Bitte führen Sie einen Testschnitt mit 85% der Vc und 75% des fz durch. Nach erfolgtem Test können Sie die Schnittgeschwindigkeit bzw. die Vorschubwerte entsprechend erhöhen.*
- *Bitte verwenden Sie nur Spannmittel mit einer hohen Genauigkeit und einer hohen Spannkraft. Überprüfen Sie den Rundlauf der Werkzeuge. Sie sollten darauf achten, dass der Rundlauffehler nicht größer als 0.01mm ist.*
- *Bei Fräsoperationen, die mit einer $a_p=1*d_1$ durchgeführt werden, ist f_z um 25% zu reduzieren.*

Recommended cutting data · Empfohlene Schnittdaten

Type *Typ*	Grade *Sorte*		Material *Werkstoffe*	d_1 (mm)	z	Vc (m/min)	f_z (mm/z)	a_p (mm)	a_e (mm)	n (min^{-1})	V_f (mm/min)
5501R303GM	KMG303	P	Steel *Stahl* HRC<25	3.00	3	100	0.010	1.50	3.00	10610	318
5601R303GM	KMG303			4.00	3	100	0.015	2.00	4.00	7950	358
				5.00	3	100	0.020	2.50	5.00	6360	382
				6.00	3	100	0.024	3.00	6.00	5300	382
				8.00	3	100	0.032	4.00	8.00	3970	381
				10.00	3	100	0.038	5.00	10.00	3180	363
				12.00	3	100	0.046	6.00	12.00	2650	366
				16.00	3	100	0.054	8.00	16.00	1980	321
				20.00	3	100	0.066	10.00	20.00	1590	315
			Steel, Steel alloy *Stahl, legierter Stahl* HRC=25-38	3.00	3	70	0.010	1.50	3.00	7420	223
				4.00	3	70	0.015	2.00	4.00	5570	251
				5.00	3	70	0.020	2.50	5.00	4450	267
				6.00	3	70	0.024	3.00	6.00	3710	267
				8.00	3	70	0.032	4.00	8.00	2780	267
				10.00	3	70	0.038	5.00	10.00	2220	253
				12.00	3	70	0.046	6.00	12.00	1850	255
				16.00	3	70	0.054	8.00	16.00	1390	225
				20.00	3	70	0.066	10.00	20.00	1110	220
		P	High ally steel *Hochlegierter Stahl*	3.00	3	35	0.010	1.50	3.00	3710	111
				4.00	3	35	0.015	2.00	4.00	2780	125
				5.00	3	35	0.020	2.50	5.00	2220	133
		M	Stainless steel *Rostfreier Stahl*	6.00	3	35	0.024	3.00	6.00	1850	133
				8.00	3	35	0.032	4.00	8.00	1390	133
				10.00	3	35	0.038	5.00	10.00	1110	127
		S	Ti and Ti alloys *Ti-Legierungen* High temperature alloys *Warmfeste Superlegierungen*	12.00	3	35	0.046	6.00	12.00	920	127
				16.00	3	35	0.054	8.00	16.00	690	112
				20.00	3	35	0.066	10.00	20.00	550	109
		K	Cast iron *Guss*	3.00	3	115	0.010	1.50	3.00	12200	366
				4.00	3	115	0.015	2.00	4.00	9150	412
				5.00	3	115	0.020	2.50	5.00	7320	439
				6.00	3	115	0.024	3.00	6.00	6100	439
				8.00	3	115	0.032	4.00	8.00	4570	439
				10.00	3	115	0.038	5.00	10.00	3660	417
				12.00	3	115	0.046	6.00	12.00	3050	421
				16.00	3	115	0.054	8.00	16.00	2280	369
				20.00	3	115	0.066	10.00	20.00	1830	362
		N	Aluminum alloy *Alu-Legierung* Si<=10%	3.00	3	210	0.010	1.50	3.00	22280	668
				4.00	3	210	0.015	2.00	4.00	16710	752
				5.00	3	210	0.020	2.50	5.00	13360	802
				6.00	3	210	0.024	3.00	6.00	11140	802
				8.00	3	210	0.032	4.00	8.00	8350	802
				10.00	3	210	0.038	5.00	10.00	6680	762
				12.00	3	210	0.046	6.00	12.00	5570	769
				16.00	3	210	0.054	8.00	16.00	4170	676
				20.00	3	210	0.066	10.00	20.00	3340	661
			Brass Bronze *Kupfer*	3.00	3	85	0.010	1.50	3.00	9010	270
				4.00	3	85	0.015	2.00	4.00	6760	304
				5.00	3	85	0.020	2.50	5.00	5410	325
				6.00	3	85	0.024	3.00	6.00	4500	324
				8.00	3	85	0.032	4.00	8.00	3380	324
				10.00	3	85	0.038	5.00	10.00	2700	308
				12.00	3	85	0.046	6.00	12.00	2250	311
				16.00	3	85	0.054	8.00	16.00	1690	274
				20.00	3	85	0.066	10.00	20.00	1350	267





- Please start a test cutting with 85% of the Vc or 75% of the f_z, then increase the cutting speed and feed rate.
- Please use high precision and high rigidity clamping system. The oscillation of the tool cannot be over 0.01 mm.
- When $a_p=1*d_1$, f_z =75% as the data in the table

- *Bitte führen Sie einen Testschnitt mit 85% der Vc und 75% des fz durch. Nach erfolgtem Test können Sie die Schnittgeschwindigkeit bzw. die Vorschubwerte entsprechend erhöhen.*
- *Bitte verwenden Sie nur Spannmittel mit einer hohen Genauigkeit und einer hohen Spannkraft. Überprüfen Sie den Rundlauf der Werkzeuge. Sie sollten darauf achten, dass der Rundlauffehler nicht größer als 0.01mm ist.*
- *Bei Fräsoperationen, die mit einer $a_p=1*d_1$ durchgeführt werden, ist f_z um 25% zu reduzieren.*

Recommended cutting data · Empfohlene Schnittdaten

Type *Typ*	Grade *Sorte*		Material *Werkstoffe*	d_1 (mm)	z	Vc (m/min)	f_z (mm/z)	a_p (mm)	a_e (mm)	n (min^{-1})	V_f (mm/min)
5501R304GF	KMG303	P	Steel *Stahl* HRC<25	3.00	4	160	0.010	3.00	0.30	16970	679
5601R304GF	KMG303			4.00	4	160	0.015	4.00	0.40	12730	764
				5.00	4	160	0.020	5.00	0.50	10180	814
				6.00	4	160	0.024	6.00	0.60	8480	814
				8.00	4	160	0.032	8.00	0.80	6360	814
				10.00	4	160	0.038	10.00	1.00	5090	774
				12.00	4	160	0.046	12.00	1.20	4240	780
				16.00	4	160	0.054	16.00	1.60	3180	687
				20.00	4	160	0.066	20.00	2.00	2540	671
			Steel, Steel alloy *Stahl, legierter Stahl* HRC=25-38	3.00	4	110	0.010	3.00	0.30	11670	467
				4.00	4	110	0.015	4.00	0.40	8750	525
				5.00	4	110	0.020	5.00	0.50	7000	560
				6.00	4	110	0.024	6.00	0.60	5830	560
				8.00	4	110	0.032	8.00	0.80	4370	559
				10.00	4	110	0.038	10.00	1.00	3500	532
				12.00	4	110	0.046	12.00	1.20	2910	535
				16.00	4	110	0.054	16.00	1.60	2180	471
				20.00	4	110	0.066	20.00	2.00	1750	462
		P	High ally steel *Hochlegierter Stahl*	3.00	4	70	0.010	3.00	0.30	7420	297
				4.00	4	70	0.015	4.00	0.40	5570	334
				5.00	4	70	0.020	5.00	0.50	4450	356
				6.00	4	70	0.024	6.00	0.60	3710	356
				8.00	4	70	0.032	8.00	0.80	2780	356
		M	Stainless steel *Rostfreier Stahl*	10.00	4	70	0.038	10.00	1.00	2220	337
				12.00	4	70	0.046	12.00	1.20	1850	340
				16.00	4	70	0.054	16.00	1.60	1390	300
				20.00	4	70	0.066	20.00	2.00	1110	293
		K	Cast iron *Guss*	3.00	4	130	0.010	3.00	0.30	13790	552
				4.00	4	130	0.015	4.00	0.40	10340	620
				5.00	4	130	0.020	5.00	0.50	8270	662
				6.00	4	130	0.024	6.00	0.60	6890	661
				8.00	4	130	0.032	8.00	0.80	5170	662
				10.00	4	130	0.038	10.00	1.00	4130	628
				12.00	4	130	0.046	12.00	1.20	3440	633
				16.00	4	130	0.054	16.00	1.60	2580	557
				20.00	4	130	0.066	20.00	2.00	2060	544
		S	Ti and Ti alloys *Ti-Legierungen*	3.00	4	80	0.010	3.00	0.30	8480	339
				4.00	4	80	0.015	4.00	0.40	6360	382
				5.00	4	80	0.020	5.00	0.50	5090	407
				6.00	4	80	0.024	6.00	0.60	4240	407
				8.00	4	80	0.032	8.00	0.80	3180	407
				10.00	4	80	0.038	10.00	1.00	2540	386
				12.00	4	80	0.046	12.00	1.20	2120	390
				16.00	4	80	0.054	16.00	1.60	1590	343
				20.00	4	80	0.066	20.00	2.00	1270	335
			Ni-High temperature alloys *Ni-Warmfeste Superlegierungen*	3.00	4	40	0.010	3.00	0.30	4240	170
				4.00	4	40	0.015	4.00	0.40	3180	191
				5.00	4	40	0.020	5.00	0.50	2540	203
				6.00	4	40	0.024	6.00	0.60	2120	204
				8.00	4	40	0.032	8.00	0.80	1590	204
				10.00	4	40	0.038	10.00	1.00	1270	193
				12.00	4	40	0.046	12.00	1.20	1060	195
				16.00	4	40	0.054	16.00	1.60	790	171
				20.00	4	40	0.066	20.00	2.00	630	166





- Please start a test cutting with 85% of the Vc or 75% of the f_z, then increase the cutting speed and feed rate.
- Please use high precision and high rigidity clamping system. The oscillation of the tool cannot be over 0.01 mm.
- When $a_p=1*d_1$, f_z =75% as the data in the table
- Recommended operation: climb milling

- *Bitte führen Sie einen Testschnitt mit 85% der Vc und 75% des fz durch. Nach erfolgtem Test können Sie die Schnittgeschwindigkeit bzw. die Vorschubwerte entsprechend erhöhen.*
- *Bitte verwenden Sie nur Spannmittel mit einer hohen Genauigkeit und einer hohen Spannkraft. Überprüfen Sie den Rundlauf der Werkzeuge. Sie sollten darauf achten, dass der Rundlauffehler nicht größer als 0.01mm ist.*
- *Bei Fräsoperationen, die mit einer $a_p=1*d_1$ durchgeführt werden, ist f_z um 25% zu reduzieren.*
- *Empfohlene Fräsmethode: Gleichlauffräsen*

Recommended cutting data · Empfohlene Schnittdaten

Type *Typ*	Grade *Sorte*		Material *Werkstoffe*	d_1 (mm)	z	Vc (m/min)	f_z (mm/z)	a_p (mm)	a_e (mm)	n (min^{-1})	V_f (mm/min)
5502R302GM	YK30F	K	Cast iron *Guss*	3.00	2	60	0.010	1.50	3.00	6360	127
				4.00	2	60	0.015	2.00	4.00	4770	143
				5.00	2	60	0.020	2.50	5.00	3810	152
				6.00	2	60	0.024	3.00	6.00	3180	153
				8.00	2	60	0.032	4.00	8.00	2380	152
				10.00	2	60	0.038	5.00	10.00	1900	144
				12.00	2	60	0.046	6.00	12.00	1590	146
				16.00	2	60	0.054	8.00	16.00	1190	129
				20.00	2	60	0.066	10.00	20.00	950	125
		N	Aluminum alloy *Alu-Legierung* Si<=10%	3.00	2	220	0.010	1.50	3.00	23340	467
				4.00	2	220	0.015	2.00	4.00	17500	525
				5.00	2	220	0.020	2.50	5.00	14000	560
				6.00	2	220	0.024	3.00	6.00	11670	560
				8.00	2	220	0.032	4.00	8.00	8750	560
				10.00	2	220	0.038	5.00	10.00	7000	532
				12.00	2	220	0.046	6.00	12.00	5830	536
				16.00	2	220	0.054	8.00	16.00	4370	472
				20.00	2	220	0.066	10.00	20.00	3500	462
			Brass Bronze *Kupfer*	3.00	2	90	0.010	1.50	3.00	9540	191
				4.00	2	90	0.015	2.00	4.00	7160	215
				5.00	2	90	0.020	2.50	5.00	5720	229
				6.00	2	90	0.024	3.00	6.00	4770	229
				8.00	2	90	0.032	4.00	8.00	3580	229
				10.00	2	90	0.038	5.00	10.00	2860	217
				12.00	2	90	0.046	6.00	12.00	2380	219
				16.00	2	90	0.054	8.00	16.00	1790	193
				20.00	2	90	0.066	10.00	20.00	1430	189





- Please start a test cutting with 85% of the Vc or 75% of the fz, then increase the cutting speed and feed rate.
- Please use high precision and high rigidity clamping system. The oscillation of the tool can not be over 0.01 mm.
- When $a_p=1*d_1$, f_z =75% as the data in the table

- Bitte führen Sie einen Testschnitt mit 85% der Vc und 75% des fz durch.
Nach erfolgtem Test können Sie die Schnittgeschwindigkeit bzw. die Vorschubwerte entsprechend erhöhen.
- Bitte verwenden Sie nur Spannmittel mit einer hohen Genauigkeit und einer hohen Spannkraft.
Überprüfen Sie den Rundlauf der Werkzeuge. Sie sollten darauf achten, dass der Rundlauffehler nicht größer als 0.01mm ist.
- Bei Fräsoperationen, die mit einer $a_p=1*d_1$ durchgeführt werden, ist f_z um 25% zu reduzieren.

Recommended cutting data · Empfohlene Schnittdaten

Type *Typ*	Grade *Sorte*		Material *Werkstoffe*	d_1 (mm)	z	Vc (m/min)	f_z (mm/z)	a_p (mm)	a_e (mm)	n (min^{-1})	V_f (mm/min)
5502R302GM	KMG303	P	Steel *Stahl* HRC<25	3.00	2	95	0.010	1.50	3.00	10070	201
5602R302GM	KMG303			4.00	2	95	0.015	2.00	4.00	7550	227
				5.00	2	95	0.020	2.50	5.00	6040	242
				6.00	2	95	0.024	3.00	6.00	5030	241
				8.00	2	95	0.032	4.00	8.00	3770	241
				10.00	2	95	0.038	5.00	10.00	3020	230
				12.00	2	95	0.046	6.00	12.00	2510	231
				16.00	2	95	0.054	8.00	16.00	1880	203
				20.00	2	95	0.066	10.00	20.00	1510	199
		P	Steel, Steel alloy *Stahl, legierter Stahl* HRC=25-38	3.00	2	70	0.010	1.50	3.00	7420	148
				4.00	2	70	0.015	2.00	4.00	5570	167
				5.00	2	70	0.020	2.50	5.00	4450	178
				6.00	2	70	0.024	3.00	6.00	3710	178
				8.00	2	70	0.032	4.00	8.00	2780	178
				10.00	2	70	0.038	5.00	10.00	2220	169
				12.00	2	70	0.046	6.00	12.00	1850	170
				16.00	2	70	0.054	8.00	16.00	1390	150
				20.00	2	70	0.066	10.00	20.00	1110	147
		P	High ally steel *Hochlegierter Stahl*	3.00	2	40	0.010	1.50	3.00	4240	85
				4.00	2	40	0.010	2.00	4.00	3180	64
				5.00	2	40	0.014	2.50	5.00	2540	71
		M	Stainless steel *Rostfreier Stahl*	6.00	2	40	0.017	3.00	6.00	2120	72
				8.00	2	40	0.024	4.00	8.00	1590	76
				10.00	2	40	0.030	5.00	10.00	1270	76
		S	Ti and Ti alloys *Ti-Legierungen*	12.00	2	40	0.036	6.00	12.00	1060	76
				16.00	2	40	0.045	8.00	16.00	790	71
				20.00	2	40	0.057	10.00	20.00	630	72
		K	Cast iron *Guss*	3.00	2	100	0.010	1.50	3.00	10610	212
				4.00	2	100	0.015	2.00	4.00	7950	239
				5.00	2	100	0.020	2.50	5.00	6360	254
				6.00	2	100	0.024	3.00	6.00	5300	254
				8.00	2	100	0.032	4.00	8.00	3970	254
				10.00	2	100	0.038	5.00	10.00	3180	242
				12.00	2	100	0.046	6.00	12.00	2650	244
				16.00	2	100	0.054	8.00	16.00	1980	214
				20.00	2	100	0.066	10.00	20.00	1590	210
		N	Aluminum alloy *Alu-Legierung* Si<=10%	3.00	2	220	0.010	1.50	3.00	23340	467
				4.00	2	220	0.015	2.00	4.00	17500	525
				5.00	2	220	0.020	2.50	5.00	14000	560
				6.00	2	220	0.024	3.00	6.00	11670	560
				8.00	2	220	0.032	4.00	8.00	8750	560
				10.00	2	220	0.038	5.00	10.00	7000	532
				12.00	2	220	0.046	6.00	12.00	5830	536
				16.00	2	220	0.054	8.00	16.00	4370	472
				20.00	2	220	0.066	10.00	20.00	3500	462
		N	Brass Bronze *Kupfer*	3.00	2	90	0.010	1.50	3.00	9540	191
				4.00	2	90	0.015	2.00	4.00	7160	215
				5.00	2	90	0.020	2.50	5.00	5720	229
				6.00	2	90	0.024	3.00	6.00	4770	229
				8.00	2	90	0.032	4.00	8.00	3580	229
				10.00	2	90	0.038	5.00	10.00	2860	217
				12.00	2	90	0.046	6.00	12.00	2380	219
				16.00	2	90	0.054	8.00	16.00	1790	193
				20.00	2	90	0.066	10.00	20.00	1430	189





- Please start a test cutting with 85% of the Vc or 75% of the f_z, then increase the cutting speed and feed rate.
- Please use high precision and high rigidity clamping system. The oscillation of the tool cannot be over 0.01 mm.
- When a_p=1*d_1, f_z =75% as the data in the table

- *Bitte führen Sie einen Testschnitt mit 85% der Vc und 75% des fz durch. Nach erfolgtem Test können Sie die Schnittgeschwindigkeit bzw. die Vorschubwerte entsprechend erhöhen.*
- *Bitte verwenden Sie nur Spannmittel mit einer hohen Genauigkeit und einer hohen Spannkraft. Überprüfen Sie den Rundlauf der Werkzeuge. Sie sollten darauf achten, dass der Rundlauffehler nicht größer als 0.01mm ist.*
- *Bei Fräsoperationen, die mit einer a_p=1*d_1 durchgeführt werden, ist f_z um 25% zu reduzieren.*

Recommended cutting data · Empfohlene Schnittdaten

Type *Typ*	Grade *Sorte*		Material *Werkstoffe*	d_1 (mm)	z	Vc (m/min)	f_z (mm/z)	a_p (mm)	a_e (mm)	n (min^{-1})	V_f (mm/min)
5502R303GM	KMG303	P	Steel *Stahl* HRC<25	3.00	3	120	0.010	1.50	0.75	12730	382
5602R303GM	KMG303			4.00	3	120	0.015	2.00	1.00	9540	429
5508R454GM	KMG303			5.00	3	120	0.020	2.50	1.25	7630	458
5602R454GM	KMG303			6.00	3	120	0.024	3.00	1.50	6360	458
				8.00	3	120	0.032	4.00	2.00	4770	458
				10.00	3	120	0.038	5.00	2.50	3810	434
				12.00	3	120	0.046	6.00	3.00	3180	439
				16.00	3	120	0.054	8.00	4.00	2380	386
				20.00	3	120	0.066	10.00	5.00	1900	376
		P	Steel, Steel alloy *Stahl, legierter Stahl* HRC=25-38	3.00	3	90	0.010	1.50	0.75	9540	286
				4.00	3	90	0.015	2.00	1.00	7160	322
				5.00	3	90	0.020	2.50	1.25	5720	343
				6.00	3	90	0.024	3.00	1.50	4770	343
				8.00	3	90	0.032	4.00	2.00	3580	344
				10.00	3	90	0.038	5.00	2.50	2860	326
				12.00	3	90	0.046	6.00	3.00	2380	328
				16.00	3	90	0.054	8.00	4.00	1790	290
				20.00	3	90	0.066	10.00	5.00	1430	283
		P	High ally steel *Hochlegierter Stahl*	3.00	3	40	0.010	1.50	0.75	4240	127
				4.00	3	40	0.015	2.00	1.00	3180	143
				5.00	3	40	0.020	2.50	1.25	2540	152
		M	Stainless steel *Rostfreier Stahl*	6.00	3	40	0.024	3.00	1.50	2120	153
				8.00	3	40	0.032	4.00	2.00	1590	153
				10.00	3	40	0.038	5.00	2.50	1270	145
		S	Ti and Ti alloys *Ti-Legierungen*	12.00	3	40	0.046	6.00	3.00	1060	146
				16.00	3	40	0.054	8.00	4.00	790	128
				20.00	3	40	0.066	10.00	5.00	630	125
		K	Cast iron *Guss*	3.00	3	150	0.010	1.50	0.75	15910	477
				4.00	3	150	0.015	2.00	1.00	11930	537
				5.00	3	150	0.022	2.50	1.25	9540	630
				6.00	3	150	0.027	3.00	1.50	7950	644
				8.00	3	150	0.035	4.00	2.00	5960	626
				10.00	3	150	0.044	5.00	2.50	4770	630
				12.00	3	150	0.052	6.00	3.00	3970	619
				16.00	3	150	0.063	8.00	4.00	2980	563
				20.00	3	150	0.080	10.00	5.00	2380	571
		N	Aluminum alloy *Alu-Legierung* Si<=10%	3.00	3	300	0.015	1.50	0.75	31830	1432
				4.00	3	300	0.020	2.00	1.00	23870	1432
				5.00	3	300	0.025	2.50	1.25	19090	1432
				6.00	3	300	0.029	3.00	1.50	15910	1384
				8.00	3	300	0.042	4.00	2.00	11930	1503
				10.00	3	300	0.050	5.00	2.50	9540	1431
				12.00	3	300	0.059	6.00	3.00	7950	1407
				16.00	3	300	0.072	8.00	4.00	5960	1287
				20.00	3	300	0.090	10.00	5.00	4770	1288
		N	Brass Bronze *Kupfer*	3.00	3	150	0.015	1.50	0.75	15910	716
				4.00	3	150	0.020	2.00	1.00	11930	716
				5.00	3	150	0.025	2.50	1.25	9540	716
				6.00	3	150	0.029	3.00	1.50	7950	692
				8.00	3	150	0.042	4.00	2.00	5960	751
				10.00	3	150	0.050	5.00	2.50	4770	716
				12.00	3	150	0.059	6.00	3.00	3970	703
				16.00	3	150	0.072	8.00	4.00	2980	644
				20.00	3	150	0.090	10.00	5.00	2380	643





- Please start a test cutting with 85% of the Vc or 75% of the f_z, then increase the cutting speed and feed rate.
- Please use high precision and high rigidity clamping system. The oscillation of the tool cannot be over 0.01 mm.
- When $a_p=1*d_1$, f_z =75% as the data in the table
- Recommended operation: climb milling

- Bitte führen Sie einen Testschnitt mit 85% der Vc und 75% des fz durch. Nach erfolgtem Test können Sie die Schnittgeschwindigkeit bzw. die Vorschubwerte entsprechend erhöhen.
- Bitte verwenden Sie nur Spannmittel mit einer hohen Genauigkeit und einer hohen Spannkraft. Überprüfen Sie den Rundlauf der Werkzeuge. Sie sollten darauf achten, dass der Rundlauffehler nicht größer als 0.01mm ist.
- Bei Fräsoperationen, die mit einer $a_p=1*d_1$ durchgeführt werden, ist f_z um 25% zu reduzieren.
- Empfohlene Fräsmethode: Gleichlauffräsen

Recommended cutting data · Empfohlene Schnittdaten

Type *Typ*	Grade *Sorte*		Material *Werkstoffe*	d_1 (mm)	z	Vc (m/min)	f_z (mm/z)	a_p (mm)	a_e (mm)	n (min^{-1})	V_f (mm/min)
5502R453GM	KMG405	P	Steel *Stahl* HRC<25	3.00	3	120	0.010	4.50	0.30	12730	382
5602R453GM	KMG405			4.00	3	120	0.015	6.00	0.40	9540	429
				5.00	3	120	0.020	7.50	0.50	7630	458
				6.00	3	120	0.024	9.00	0.60	6360	458
				8.00	3	120	0.032	12.00	0.80	4770	458
				10.00	3	120	0.038	15.00	1.00	3810	434
				12.00	3	120	0.046	18.00	1.20	3180	439
				16.00	3	120	0.054	24.00	1.60	2380	386
				20.00	3	120	0.066	30.00	2.00	1900	376
		P	Steel, Steel alloy *Stahl, legierter Stahl* HRC=25-38	3.00	3	90	0.010	4.50	0.30	9540	286
				4.00	3	90	0.015	6.00	0.40	7160	322
				5.00	3	90	0.020	7.50	0.50	5720	343
				6.00	3	90	0.024	9.00	0.60	4770	343
				8.00	3	90	0.032	12.00	0.80	3580	344
				10.00	3	90	0.038	15.00	1.00	2860	326
				12.00	3	90	0.046	18.00	1.20	2380	328
				16.00	3	90	0.054	24.00	1.60	1790	290
				20.00	3	90	0.066	30.00	2.00	1430	283
		P	High ally steel *Hochlegierter Stahl*	3.00	3	50	0.010	4.50	0.30	5300	159
				4.00	3	50	0.015	6.00	0.40	3970	179
				5.00	3	50	0.020	7.50	0.50	3180	191
		M	Stainless steel *Rostfreier Stahl*	6.00	3	50	0.024	9.00	0.60	2650	191
				8.00	3	50	0.032	12.00	0.80	1980	190
				10.00	3	50	0.038	15.00	1.00	1590	181
		S	Ti and Ti alloys *Ti-Legierungen* High temperature alloys *Warmfeste Superlegierungen*	12.00	3	50	0.046	18.00	1.20	1320	182
				16.00	3	50	0.054	24.00	1.60	990	160
				20.00	3	50	0.066	30.00	2.00	790	156
		K	Cast iron *Guss*	3.00	3	150	0.010	4.50	0.30	15910	477
				4.00	3	150	0.015	6.00	0.40	11930	537
				5.00	3	150	0.020	7.50	0.50	9540	572
				6.00	3	150	0.024	9.00	0.60	7950	572
				8.00	3	150	0.032	12.00	0.80	5960	572
				10.00	3	150	0.038	15.00	1.00	4770	544
				12.00	3	150	0.046	18.00	1.20	3970	548
				16.00	3	150	0.054	24.00	1.60	2980	483
				20.00	3	150	0.066	30.00	2.00	2380	471
		N	Aluminum alloy *Alu-Legierung* Si<=10%	3.00	3	300	0.024	1.50	1.50	31830	2292
				4.00	3	300	0.300	2.00	2.00	23870	21483
				5.00	3	300	0.032	2.50	2.50	19090	1833
				6.00	3	300	0.041	3.00	3.00	15910	1957
				8.00	3	300	0.058	4.00	4.00	11930	2076
				10.00	3	300	0.073	5.00	5.00	9540	2089
				12.00	3	300	0.090	6.00	6.00	7950	2147
				16.00	3	300	0.110	8.00	8.00	5960	1967
				20.00	3	300	0.130	10.00	10.00	4770	1860
		N	Brass Bronze *Kupfer*	3.00	3	150	0.024	1.50	1.50	15910	1146
				4.00	3	150	0.300	2.00	2.00	11930	10737
				5.00	3	150	0.032	2.50	2.50	9540	916
				6.00	3	150	0.041	3.00	3.00	7950	978
				8.00	3	150	0.058	4.00	4.00	5960	1037
				10.00	3	150	0.073	5.00	5.00	4770	1045
				12.00	3	150	0.090	6.00	6.00	3970	1072
				16.00	3	150	0.110	8.00	8.00	2980	983
				20.00	3	150	0.130	10.00	10.00	2380	928





- Please start a test cutting with 85% of the Vc or 75% of the f_z, then increase the cutting speed and feed rate.
- Please use high precision and high rigidity clamping system. The oscillation of the tool cannot be over 0.01 mm.
- When a_p=1*d_1, f_z =75% as the data in the table
- Recommended operation: climb milling

- *Bitte führen Sie einen Testschnitt mit 85% der Vc und 75% des fz durch. Nach erfolgtem Test können Sie die Schnittgeschwindigkeit bzw. die Vorschubwerte entsprechend erhöhen.*
- *Bitte verwenden Sie nur Spannmittel mit einer hohen Genauigkeit und einer hohen Spannkraft. Überprüfen Sie den Rundlauf der Werkzeuge. Sie sollten darauf achten, dass der Rundlauffehler nicht größer als 0.01mm ist.*
- *Bei Fräsoperationen, die mit einer a_p=1*d_1 durchgeführt werden, ist f_z um 25% zu reduzieren.*
- *Empfohlene Fräsmethode: Gleichlauffräsen*

Recommended cutting data · Empfohlene Schnittdaten

Type *Typ*	Grade *Sorte*		Material *Werkstoffe*	d_1 (mm)	z	Vc (m/min)	f_z (mm/z)	a_p (mm)	a_e (mm)	n (min^{-1})	V_f (mm/min)
5502R304GF	KMG303	P	Steel *Stahl* HRC<25	3.00	4	160	0.020	3.00	0.20	16970	1358
5602R304GF	KMG303			4.00	4	160	0.025	4.00	0.20	12730	1273
5508R454GM	KMG303			5.00	4	160	0.028	5.00	0.30	10180	1140
				6.00	4	160	0.036	6.00	0.30	8480	1221
				8.00	4	160	0.052	8.00	0.40	6360	1323
				10.00	4	160	0.065	10.00	0.50	5090	1323
				12.00	4	160	0.079	12.00	0.60	4240	1340
				16.00	4	160	0.095	16.00	0.80	3180	1208
				20.00	4	160	0.110	20.00	1.00	2540	1118
		P	Steel, Steel alloy *Stahl, legierter Stahl* HRC=25-38	3.00	4	120	0.016	3.00	0.20	12730	815
				4.00	4	120	0.020	4.00	0.20	9540	763
				5.00	4	120	0.026	5.00	0.30	7630	794
				6.00	4	120	0.031	6.00	0.30	6360	789
				8.00	4	120	0.042	8.00	0.40	4770	801
				10.00	4	120	0.053	10.00	0.50	3810	808
				12.00	4	120	0.063	12.00	0.60	3180	801
				16.00	4	120	0.079	16.00	0.80	2380	752
				20.00	4	120	0.097	20.00	1.00	1900	737
		P	High ally steel *Hochlegierter Stahl*	3.00	4	70	0.016	3.00	0.20	7420	475
				4.00	4	70	0.020	4.00	0.20	5570	446
				5.00	4	70	0.026	5.00	0.30	4450	463
				6.00	4	70	0.031	6.00	0.30	3710	460
				8.00	4	70	0.042	8.00	0.40	2780	467
				10.00	4	70	0.053	10.00	0.50	2220	471
		M	Stainless steel *Rostfreier Stahl*	12.00	4	70	0.063	12.00	0.60	1850	466
				16.00	4	70	0.079	16.00	0.80	1390	439
				20.00	4	70	0.097	20.00	1.00	1110	431
		K	Cast iron *Guss*	3.00	4	150	0.022	3.00	0.20	15910	1400
				4.00	4	150	0.025	4.00	0.20	11930	1193
				5.00	4	150	0.030	5.00	0.30	9540	1145
				6.00	4	150	0.039	6.00	0.30	7950	1240
				8.00	4	150	0.054	8.00	0.40	5960	1287
				10.00	4	150	0.066	10.00	0.50	4770	1259
				12.00	4	150	0.085	12.00	0.60	3970	1350
				16.00	4	150	0.100	16.00	0.80	2980	1192
				20.00	4	150	0.120	20.00	1.00	2380	1142
		S	Ti and Ti alloys *Ti-Legierungen*	3.00	4	80	0.015	3.00	0.20	8480	509
				4.00	4	80	0.020	4.00	0.20	6360	509
				5.00	4	80	0.025	5.00	0.30	5090	509
				6.00	4	80	0.029	6.00	0.30	4240	492
				8.00	4	80	0.042	8.00	0.40	3180	534
				10.00	4	80	0.050	10.00	0.50	2540	508
				12.00	4	80	0.059	12.00	0.60	2120	500
				16.00	4	80	0.072	16.00	0.80	1590	458
				20.00	4	80	0.090	20.00	1.00	1270	457
		S	Ni-High temperature alloys *Ni-Warmfeste Superlegierungen*	3.00	4	40	0.016	3.00	0.20	4240	271
				4.00	4	40	0.020	4.00	0.20	3180	254
				5.00	4	40	0.026	5.00	0.30	2540	264
				6.00	4	40	0.031	6.00	0.30	2120	263
				8.00	4	40	0.042	8.00	0.40	1590	267
				10.00	4	40	0.053	10.00	0.50	1270	269
				12.00	4	40	0.063	12.00	0.60	1060	267
				16.00	4	40	0.079	16.00	0.80	790	250
				20.00	4	40	0.097	20.00	1.00	630	244





- Please start a test cutting with 85% of the Vc or 75% of the f_z, then increase the cutting speed and feed rate.
- Please use high precision and high rigidity clamping system. The oscillation of the tool cannot be over 0.01 mm.
- When a_p=1*d_1, f_z =75% as the data in the table
- Recommended operation: climb milling

- *Bitte führen Sie einen Testschnitt mit 85% der Vc und 75% des fz durch. Nach erfolgtem Test können Sie die Schnittgeschwindigkeit bzw. die Vorschubwerte entsprechend erhöhen.*
- *Bitte verwenden Sie nur Spannmittel mit einer hohen Genauigkeit und einer hohen Spannkraft. Überprüfen Sie den Rundlauf der Werkzeuge. Sie sollten darauf achten, dass der Rundlauffehler nicht größer als 0.01mm ist.*
- *Bei Fräsoperationen, die mit einer a_p=1*d_1 durchgeführt werden, ist f_z um 25% zu reduzieren.*
- *Empfohlene Fräsmethode: Gleichlauffräsen*

Recommended cutting data · Empfohlene Schnittdaten

Type *Typ*	Grade *Sorte*		Material *Werkstoffe*	d_1 (mm)	z	Vc (m/min)	f_z (mm/z)	a_p (mm)	a_e (mm)	n (min^{-1})	V_f (mm/min)
5589R45MGFR	KMG405	P	Steel *Stahl* HRC<30	6.00	6	130	0.011	15.00	0.30	6890	455
				8.00	6	130	0.016	20.00	0.40	5170	496
				10.00	6	130	0.021	25.00	0.50	4130	520
				12.00	6	130	0.026	30.00	0.60	3440	537
				16.00	8	130	0.032	40.00	0.80	2580	660
				20.00	10	130	0.038	50.00	1.00	2060	783
		P	Steel, steel alloy *Stahl, legierter Stahl* HRC=30-48	6.00	6	90	0.011	15.00	0.30	4770	315
				8.00	6	90	0.016	20.00	0.40	3580	344
				10.00	6	90	0.021	25.00	0.50	2860	360
				12.00	6	90	0.026	30.00	0.60	2380	371
				16.00	8	90	0.032	40.00	0.80	1790	458
				20.00	10	90	0.038	50.00	1.00	1430	543
		P	High alloys steel *Hoch legierter Stahl*	6.00	6	50	0.011	15.00	0.30	2650	175
				8.00	6	50	0.016	20.00	0.40	1980	190
				10.00	6	50	0.021	25.00	0.50	1590	200
				12.00	6	50	0.026	30.00	0.60	1320	206
				16.00	8	50	0.032	40.00	0.80	990	253
				20.00	10	50	0.038	50.00	1.00	790	300
		K	Cast iron *Guss*	6.00	6	100	0.011	15.00	0.30	5300	350
				8.00	6	100	0.016	20.00	0.40	3970	381
				10.00	6	100	0.021	25.00	0.50	3180	401
				12.00	6	100	0.026	30.00	0.60	2650	413
				16.00	8	100	0.032	40.00	0.80	1980	507
				20.00	10	100	0.038	50.00	1.00	1590	604
		H	Hard steel *Gehärteter Stahl* HRC=48-54	6.00	6	60	0.011	15.00	0.30	3180	210
				8.00	6	60	0.016	20.00	0.40	2380	228
				10.00	6	60	0.021	25.00	0.50	1900	239
				12.00	6	60	0.026	30.00	0.60	1590	248
				16.00	8	60	0.032	40.00	0.80	1190	305
				20.00	10	60	0.038	50.00	1.00	950	361





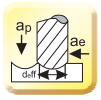
- Please start a test cutting with 85% of the Vc or 75% of the fz, then increase the cutting speed and feed rate.
- Please use high precision and high rigidity clamping system. The oscillation of the tool can not be over 0.01 mm.
- When $a_p=1*d_1$, f_z =50% as the data in the table
- Recommended operation: climb milling

- *Bitte führen Sie einen Testschnitt mit 85% der Vc und 75% des fz durch.*
  Nach erfolgtem Test können Sie die Schnittgeschwindigkeit bzw. die Vorschubwerte entsprechend erhöhen.
- *Bitte verwenden Sie nur Spannmittel mit einer hohen Genauigkeit und einer hohen Spannkraft.*
  Überprüfen Sie den Rundlauf der Werkzeuge. Sie sollten darauf achten, dass der Rundlauffehler nicht größer als 0.01mm ist.
- *Bei Fräsoperationen, die mit einer $a_p=1*d_1$ durchgeführt werden, ist f_z um 50% zu reduzieren.*
- *Empfohlene Fräsmethode: Gleichlauffräsen*

Recommended cutting data · Empfohlene Schnittdaten

Type *Typ*	Grade *Sorte*		Material *Werkstoffe*	d_1 (mm)	z	Vc (m/min)	f_z (mm/z)	a_p (mm)	a_e (mm)	d_{eff} (mm)	n (min^{-1})	V_f (mm/min)
5565R302GF	KMG303	P	Steel *Stahl* HRC=24-30	3.00	2	225	0.060	0.09	0.18	1.02		
5665R202GM	KMG303			4.00	2	225	0.080	0.12	0.24	1.36		
				5.00	2	225	0.100	0.15	0.30	1.71		
				6.00	2	225	0.120	0.18	0.36	2.05		
				8.00	2	225	0.120	0.24	0.48	2.73		
				10.00	2	225	0.150	0.30	0.60	3.41		
				12.00	2	225	0.180	0.36	0.72	4.09		
				16.00	2	225	0.160	0.48	0.96	5.46		
			Steel *Stahl* HRC=32-42	3.00	2	200	0.060	0.09	0.18	1.02		
				4.00	2	200	0.080	0.12	0.24	1.36		
				5.00	2	200	0.100	0.15	0.30	1.71		
				6.00	2	200	0.120	0.18	0.36	2.05		
				8.00	2	200	0.120	0.24	0.48	2.73		
				10.00	2	200	0.150	0.30	0.60	3.41		
				12.00	2	200	0.180	0.36	0.72	4.09		
				16.00	2	200	0.160	0.48	0.96	5.46		
			Steel *Stahl* HRC=42-48	3.00	2	180	0.060	0.09	0.18	1.02		
				4.00	2	180	0.080	0.12	0.24	1.36		
				5.00	2	180	0.100	0.15	0.30	1.71		
				6.00	2	180	0.120	0.18	0.36	2.05		
				8.00	2	180	0.120	0.24	0.48	2.73		
				10.00	2	180	0.150	0.30	0.60	3.41		
				12.00	2	180	0.180	0.36	0.72	4.09		
				16.00	2	180	0.160	0.48	0.96	5.46		
		K	Cast iron *Guss*	3.00	2	250	0.060	0.09	0.18	1.02		
				4.00	2	250	0.080	0.12	0.24	1.36		
				5.00	2	250	0.100	0.15	0.30	1.71		
				6.00	2	250	0.120	0.18	0.36	2.05		
				8.00	2	250	0.120	0.24	0.48	2.73		
				10.00	2	250	0.150	0.30	0.60	3.41		
				12.00	2	250	0.180	0.36	0.72	4.09		
				16.00	2	250	0.160	0.48	0.96	5.46		





- Please start a test cutting with 85% of the Vc or 75% of the fz, then increase the cutting speed and feed rate.
- Please use high precision and high rigidity clamping system. The oscillation of the tool can not be over 0.01 mm.

N = 1000Vc / d_{eff} / 3.14159

When the rotating speed of the machine on site cannot reach the maximum rotation speed of the machine used for the calculation of the rotation speed: $V_f = f_z * n * z$ (n:actual rotation of the machine)

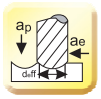
- *Bitte führen Sie einen Testschnitt mit 85% der Vc und 75% des fz durch.*
  Nach erfolgtem Test können Sie die Schnittgeschwindigkeit bzw. die Vorschubwerte entsprechend erhöhen.
- *Bitte verwenden Sie nur Spannmittel mit einer hohen Genauigkeit und einer hohen Spannkraft.*
  Überprüfen Sie den Rundlauf der Werkzeuge. Sie sollten darauf achten, dass der Rundlauffehler nicht größer als 0.01mm ist.

Sollten Sie aufgrund der Maschinendrehzahl nicht in der Lage sein, die angegebenen Drehzahlen einzuhalten, achten Sie darauf, dass Sie die Vf entsprechend anpassen. $V_f = f_z * n * z$ *(n: aktuelle Maschinendrehzahl)*

Recommended cutting data · Empfohlene Schnittdaten

Type *Typ*	Grade *Sorte*		Material *Werkstoffe*	d_1 (mm)	z	Vc (m/min)	f_z (mm/z)	a_p (mm)	a_e (mm)	d_{eff} (mm)	n (min^{-1})	V_f (mm/min)
5566R302GF	KMG303	P	Steel *Stahl* HRC=24-30	3.00	2	215	0.060	0.06	0.18	0.84		
				4.00	2	215	0.080	0.08	0.24	1.12		
				5.00	2	215	0.100	0.10	0.30	1.40		
				6.00	2	215	0.120	0.12	0.36	1.68		
				8.00	2	215	0.120	0.16	0.48	2.24		
				10.00	2	215	0.150	0.20	0.60	2.80		
				12.00	2	215	0.180	0.24	0.72	3.36		
			Steel *Stahl* HRC=32-42	3.00	2	190	0.060	0.06	0.18	0.84		
				4.00	2	190	0.080	0.08	0.24	1.12		
				5.00	2	190	0.100	0.10	0.30	1.40		
				6.00	2	190	0.120	0.12	0.36	1.68		
				8.00	2	190	0.120	0.16	0.48	2.24		
				10.0	2	190	0.150	0.20	0.60	2.80		
				12.00	2	190	0.180	0.24	0.72	3.36		
			Steel *Stahl* HRC=42-48	3.00	2	160	0.060	0.06	0.18	0.84		
				4.00	2	160	0.080	0.08	0.24	1.12		
				5.00	2	160	0.100	0.10	0.30	1.40		
				6.00	2	160	0.120	0.12	0.36	1.68		
				8.00	2	160	0.120	0.16	0.48	2.24		
				10.00	2	160	0.150	0.20	0.60	2.80		
				12.00	2	160	0.180	0.24	0.72	3.36		
		K	Cast iron *Guss*	3.00	2	230	0.060	0.06	0.18	0.84		
				4.00	2	230	0.080	0.08	0.24	1.12		
				5.00	2	230	0.100	0.10	0.30	1.40		
				6.00	2	230	0.120	0.12	0.36	1.68		
				8.00	2	230	0.120	0.16	0.48	2.24		
				10.00	2	230	0.150	0.20	0.60	2.80		
				12.00	2	230	0.180	0.24	0.72	3.36		





- Please start a test cutting with 85% of the Vc or 75% of the fz, then increase the cutting speed and feed rate.
- Please use high precision and high rigidity clamping system. The oscillation of the tool can not be over 0.01 mm.
  N = 1000Vc / d_{eff} / 3.14159
  When the rotating speed of the machine on site cannot reach the maximum rotation speed of the machine used for the calculation of the rotation speed: $V_f = f_z * n * z$ (n:actual rotation of the machine)

- *Bitte führen Sie einen Testschnitt mit 85% der Vc und 75% des fz durch.*
  Nach erfolgtem Test können Sie die Schnittgeschwindigkeit bzw. die Vorschubwerte entsprechend erhöhen.
- *Bitte verwenden Sie nur Spannmittel mit einer hohen Genauigkeit und einer hohen Spannkraft.*
  Überprüfen Sie den Rundlauf der Werkzeuge. Sie sollten darauf achten, dass der Rundlauffehler nicht größer als 0.01mm ist.

Sollten Sie aufgrund der Maschinendrehzahl nicht in der Lage sein, die angegebenen Drehzahlen einzuhalten, achten Sie darauf, dass Sie die Vf entsprechend anpassen. $V_f = f_z * n * z$ *(n: aktuelle Maschinendrehzahl)*

Recommended cutting data · Empfohlene Schnittdaten

Type *Typ*	Grade *Sorte*		Material *Werkstoffe*	d_1 (mm)	z	Vc (m/min)	f_z (mm/z)	a_p (mm)	a_e (mm)	n (min^{-1})	V_f (mm/min)
5502R402NM	YK30F	N	Al	6.00	2	350	0.080	9	1.50	18560	2970
				8.00	2	350	0.100	12	2.00	13920	2784
				10.00	2	350	0.120	15	2.50	11140	2674
				12.00	2	350	0.140	18	3.00	9280	2598
				16.00	2	350	0.180	24	4.00	6960	2506
				20.00	2	350	0.220	30	5.00	5570	2451
			Forged aluminum alloy *Geschmiedete Al-Legierung* Cast aluminum alloy *Al-Gusslegierung* Si<6%	6.00	2	900	0.080	9	1.50	47740	7638
				8.00	2	900	0.100	12	2.00	35800	7160
				10.00	2	900	0.120	15	2.50	28640	6874
				12.00	2	900	0.140	18	3.00	23870	6684
				16.00	2	900	0.180	24	4.00	17900	6444
				20.00	2	900	0.220	30	5.00	14320	6301
			Copper *Kupfer*	6.00	2	550	0.080	9	1.50	29170	4667
				8.00	2	550	0.100	12	2.00	21880	4376
				10.00	2	550	0.120	15	2.50	17500	4200
				12.00	2	550	0.140	18	3.00	14580	4082
				16.00	2	550	0.180	24	4.00	10940	3938
				20.00	2	550	0.220	30	5.00	8750	3850
			Plastic *Kunststoff*	6.00	2	1200	0.080	9	1.50	60000	9600
				8.00	2	1200	0.100	12	2.00	47740	9548
				10.00	2	1200	0.120	15	2.50	38190	9166
				12.00	2	1200	0.140	18	3.00	31830	8912
				16.00	2	1200	0.180	24	4.00	23870	8593
				20.00	2	1200	0.220	30	5.00	19090	8400





- Please start a test cutting with 85% of the Vc or 75% of the fz, then increase the cutting speed and feed rate.
- Please use high precision and high rigidity clamping system. The oscillation of the tool can not be over 0.01 mm.
  N = 1000Vc / d_{eff} / 3.14159
  When the rotating speed of the machine on site cannot reach the maximum rotation speed of the machine used for the calculation of the rotation speed: $V_f = f_z * n * z$ (n:actual rotation of the machine)
- When $a_p=1*d_1$, f_z =75% as the data in the table

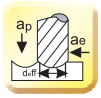
- Bitte führen Sie einen Testschnitt mit 85% der Vc und 75% des fz durch.
Nach erfolgtem Test können Sie die Schnittgeschwindigkeit bzw. die Vorschubwerte entsprechend erhöhen.
- Bitte verwenden Sie nur Spannmittel mit einer hohen Genauigkeit und einer hohen Spannkraft.
Überprüfen Sie den Rundlauf der Werkzeuge. Sie sollten darauf achten, dass der Rundlauffehler nicht größer als 0.01mm ist.

Sollten Sie aufgrund der Maschinendrehzahl nicht in der Lage sein, die angegebenen Drehzahlen einzuhalten, achten Sie darauf, dass Sie die Vf entsprechend anpassen. $V_f = f_z * n * z$ *(n: aktuelle Maschinendrehzahl)*
- Bei Fräsoperationen, die mit einer $a_p=1*d_1$ *durchgeführt werden, ist* f_z *um 25% zu reduzieren.*

Recommended cutting data · Empfohlene Schnittdaten

Type *Typ*	Grade *Sorte*		Material *Werkstoffe*	d_1 (mm)	z	Vc (m/min)	f_z (mm/z)	a_p (mm)	a_e (mm)	d_{eff} (mm)	n (min^{-1})	V_f (mm/min)
5565R302NH	YK40F	N	Forged aluminum alloy *Geschmiedete Al-Legierung* Cast aluminum alloy *Al-Gusslegierung* Si<6%	3.00	2	900	0.060	0.30	0.60	1.80		
				4.00	2	900	0.080	0.40	0.80	2.40		
				5.00	2	900	0.100	0.50	1.00	3.00		
				6.00	2	900	0.120	0.60	1.20	3.60		
				8.00	2	900	0.150	0.80	1.60	4.80		
				10.00	2	900	0.140	1.00	2.00	6.00		
				12.00	2	900	0.170	1.20	2.40	7.20		
				16.00	2	900	0.210	1.60	3.20	9.60		
			Copper *Kupfer*	3.00	2	600	0.060	0.30	0.60	1.80		
				4.00	2	600	0.080	0.40	0.80	2.40		
				5.00	2	600	0.100	0.50	1.00	3.00		
				6.00	2	600	0.120	0.60	1.20	3.60		
				8.00	2	600	0.150	0.80	1.60	4.80		
				10.00	2	600	0.140	1.00	2.00	6.00		
				12.00	2	600	0.170	1.20	2.40	7.20		
				16.00	2	600	0.210	1.60	3.20	9.60		
			Plastic *Kunststoff*	3.00	2	1200	0.060	0.30	0.60	1.80		
				4.00	2	1200	0.080	0.40	0.80	2.40		
				5.00	2	1200	0.100	0.50	1.00	3.00		
				6.00	2	1200	0.120	0.60	1.20	3.60		
				8.00	2	1200	0.150	0.80	1.60	4.80		
				10.00	2	1200	0.140	1.00	2.00	6.00		
				12.00	2	1200	0.170	1.20	2.40	7.20		
				16.00	2	1200	0.210	1.60	3.20	9.60		





- Please start a test cutting with 85% of the Vc or 75% of the fz, then increase the cutting speed and feed rate.
- Please use high precision and high rigidity clamping system. The oscillation of the tool can not be over 0.01 mm.

N = 1000Vc / d_{eff} / 3.14159

When the rotating speed of the machine on site cannot reach the maximum rotation speed of the machine used for the calculation of the rotation speed: $V_f = f_z * n * z$ (n:actual rotation of the machine)

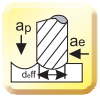
- *Bitte führen Sie einen Testschnitt mit 85% der Vc und 75% des fz durch.*
  Nach erfolgtem Test können Sie die Schnittgeschwindigkeit bzw. die Vorschubwerte entsprechend erhöhen.
- *Bitte verwenden Sie nur Spannmittel mit einer hohen Genauigkeit und einer hohen Spannkraft.*
  Überprüfen Sie den Rundlauf der Werkzeuge. Sie sollten darauf achten, dass der Rundlauffehler nicht größer als 0.01mm ist.

Sollten Sie aufgrund der Maschinendrehzahl nicht in der Lage sein, die angegebenen Drehzahlen einzuhalten, achten Sie darauf, dass Sie die Vf entsprechend anpassen. $V_f = f_z * n * z$ *(n: aktuelle Maschinendrehzahl)*

Recommended cutting data · Empfohlene Schnittdaten

Type *Typ*	Grade *Sorte*		Material *Werkstoffe*	d_1 (mm)	z	Vc (m/min)	f_z (mm/z)	a_p (mm)	a_e (mm)	d_{eff} (mm)	n (min^{-1})	V_f (mm/min)
5566R302NH	YK40F	N	Forged aluminum alloy *Geschmiedete Al-Legierung* Cast aluminum alloy *Al-Gusslegierung* Si<6%	3.00	2	650	0.060	0.15	0.30	1.31		
				4.00	2	650	0.080	0.20	0.40	1.74		
				5.00	2	650	0.100	0.25	0.50	2.18		
				6.00	2	650	0.090	0.30	0.60	2.62		
				8.00	2	650	0.120	0.40	0.80	3.49		
				10.00	2	650	0.150	0.50	1.00	4.36		
				12.00	2	650	0.120	0.60	1.20	5.23		
				16.00	2	650	0.160	0.80	1.60	6.97		
			Copper *Kupfer*	3.00	2	480	0.060	0.15	0.30	1.31		
				4.00	2	480	0.080	0.20	0.40	1.74		
				5.00	2	480	0.100	0.25	0.50	2.18		
				6.00	2	480	0.090	0.30	0.60	2.62		
				8.00	2	480	0.120	0.40	0.80	3.49		
				10.00	2	480	0.150	0.50	1.00	4.36		
				12.00	2	480	0.120	0.60	1.20	5.23		
				16.00	2	480	0.160	0.80	1.60	6.97		
			Plastic *Kunststoff*	3.00	2	950	0.060	0.15	0.30	1.31		
				4.00	2	950	0.080	0.20	0.40	1.74		
				5.00	2	950	0.100	0.25	0.50	2.18		
				6.00	2	950	0.090	0.30	0.60	2.62		
				8.00	2	950	0.120	0.40	0.80	3.49		
				10.00	2	950	0.150	0.50	1.00	4.36		
				12.00	2	950	0.120	0.60	1.20	5.23		
				16.00	2	950	0.160	0.80	1.60	6.97		





- Please start a test cutting with 85% of the Vc or 75% of the fz, then increase the cutting speed and feed rate.
- Please use high precision and high rigidity clamping system. The oscillation of the tool can not be over 0.01 mm.
  N = 1000Vc / d_{eff} / 3.14159
  When the rotating speed of the machine on site cannot reach the maximum rotation speed of the machine used for the calculation of the rotation speed: $V_f = f_z * n * z$ (n:actual rotation of the machine)

- *Bitte führen Sie einen Testschnitt mit 85% der Vc und 75% des fz durch.*
  Nach erfolgtem Test können Sie die Schnittgeschwindigkeit bzw. die Vorschubwerte entsprechend erhöhen.
- *Bitte verwenden Sie nur Spannmittel mit einer hohen Genauigkeit und einer hohen Spannkraft.*
  Überprüfen Sie den Rundlauf der Werkzeuge. Sie sollten darauf achten, dass der Rundlauffehler nicht größer als 0.01mm ist.

Sollten Sie aufgrund der Maschinendrehzahl nicht in der Lage sein, die angegebenen Drehzahlen einzuhalten, achten Sie darauf, dass Sie die Vf entsprechend anpassen. $V_f = f_z * n * z$ *(n: aktuelle Maschinendrehzahl)*

Recommended cutting data · Empfohlene Schnittdaten

Type *Typ*	Grade *Sorte*	Material *Werkstoffe*		d_1 (mm)	z	Vc (m/min)	f_z (mm/z)	a_p (mm)	a_e (mm)	n (min^{-1})	V_f (mm/min)
5585R302NHR	YK40F	N	Forged aluminum alloy *Geschmiedete Al-Legierung* Cast aluminum alloy *Al-Gusslegierung* Si<6%	6.00	2	900	0.080	6.00	3.00		
				8.00	2	900	0.075	8.00	4.00		
				10.00	2	900	0.125	10.00	5.00		
				12.00	2	900	0.150	12.00	6.00		
				16.00	2	900	0.160	16.00	8.00		
				20.00	2	900	0.230	20.00	10.00		
			Copper *Kupfer*	6.00	2	600	0.080	9.00	3.00		
				8.00	2	600	0.075	12.00	4.00		
				10.00	2	600	0.125	15.00	5.00		
				12.00	2	600	0.150	18.00	6.00		
				16.00	2	600	0.160	24.00	8.00		
				20.00	2	600	0.230	30.00	10.00		
			Plastic *Kunststoff*	6.00	2	1200	0.080	9.00	3.00		
				8.00	2	1200	0.075	12.00	4.00		
				10.00	2	1200	0.125	15.00	5.00		
				12.00	2	1200	0.150	18.00	6.00		
				16.00	2	1200	0.160	24.00	8.00		
				20.00	2	1200	0.230	30.00	10.00		





- Please start a test cutting with 85% of the Vc or 75% of the fz, then increase the cutting speed and feed rate.
- Please use high precision and high rigidity clamping system. The oscillation of the tool can not be over 0.01 mm.

N = 1000Vc / d_{eff} / 3.14159

When the rotating speed of the machine on site cannot reach the maximum rotation speed of the machine used for the calculation of the rotation speed: $V_f = f_z * n * z$ (n:actual rotation of the machine)

- *Bitte führen Sie einen Testschnitt mit 85% der Vc und 75% des fz durch. Nach erfolgtem Test können Sie die Schnittgeschwindigkeit bzw. die Vorschubwerte entsprechend erhöhen.*
- *Bitte verwenden Sie nur Spannmittel mit einer hohen Genauigkeit und einer hohen Spannkraft. Überprüfen Sie den Rundlauf der Werkzeuge. Sie sollten darauf achten, dass der Rundlauffehler nicht größer als 0.01mm ist.*

Sollten Sie aufgrund der Maschinendrehzahl nicht in der Lage sein, die angegebenen Drehzahlen einzuhalten, achten Sie darauf, dass Sie die Vf entsprechend anpassen. $V_f = f_z * n * z$ *(n: aktuelle Maschinendrehzahl)*

Recommended cutting data · Empfohlene Schnittdaten

Type *Typ*	Grade *Sorte*	Material *Werkstoffe*		d_1 (mm)	z	Vc (m/min)	f_z (mm/z)	a_p (mm)	a_e (mm)	n (min^{-1})	V_f (mm/min)
5586R302NHR	YK40F	N	Forged aluminum alloy *Geschmiedete Al-Legierung* Cast aluminum alloy *Al-Gusslegierung* Si<6%	6.00	2	650	0.055	1.50	3.00		
				8.00	2	650	0.070	2.00	4.00		
				10.00	2	650	0.090	2.50	5.00		
				12.00	2	650	0.120	3.00	6.00		
				16.00	2	650	0.160	4.00	8.00		
				20.00	2	650	0.230	5.00	10.00		
			Copper *Kupfer*	6.00	2	480	0.055	1.50	3.00		
				8.00	2	480	0.070	2.00	4.00		
				10.00	2	480	0.090	2.50	5.00		
				12.00	2	480	0.120	3.00	6.00		
				16.00	2	480	0.160	4.00	8.00		
				20.00	2	480	0.230	5.00	10.00		
			Plastic *Kunststoff*	6.00	2	950	0.055	1.50	3.00		
				8.00	2	950	0.070	2.00	4.00		
				10.00	2	950	0.090	2.50	5.00		
				12.00	2	950	0.120	3.00	6.00		
				16.00	2	950	0.160	4.00	8.00		
				20.00	2	950	0.230	5.00	10.00		





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- Please use high precision and high rigidity clamping system. The oscillation of the tool can not be over 0.01 mm.

N = 1000Vc / d_{eff} / 3.14159

When the rotating speed of the machine on site cannot reach the maximum rotation speed of the machine used for the calculation of the rotation speed: $V_f = f_z * n * z$ (n:actual rotation of the machine)

- *Bitte führen Sie einen Testschnitt mit 85% der Vc und 75% des fz durch.*
  Nach erfolgtem Test können Sie die Schnittgeschwindigkeit bzw. die Vorschubwerte entsprechend erhöhen.
- *Bitte verwenden Sie nur Spannmittel mit einer hohen Genauigkeit und einer hohen Spannkraft.*
  Überprüfen Sie den Rundlauf der Werkzeuge. Sie sollten darauf achten, dass der Rundlauffehler nicht größer als 0.01mm ist.

Sollten Sie aufgrund der Maschinendrehzahl nicht in der Lage sein, die angegebenen Drehzahlen einzuhalten, achten Sie darauf, dass Sie die Vf entsprechend anpassen. $V_f = f_z * n * z$ *(n: aktuelle Maschinendrehzahl)*

Recommended cutting data · Empfohlene Schnittdaten

Type *Typ*	Grade *Sorte*		Material *Werkstoffe*	d_1 (mm)	z	Vc (m/min)	f_z (mm/z)	a_p (mm)	a_e (mm)	d_{eff} (mm)	n (min^{-1})	V_f (mm/min)
5565R302GH	KMG405	P	Steel, steel alloy *Stahl, legierter Stahl* HRC=42-48	3.00	2	220	0.060	0.09	0.18	1.02		
				4.00	2	220	0.080	0.12	0.24	1.36		
				5.00	2	220	0.100	0.15	0.30	1.71		
				6.00	2	220	0.090	0.18	0.36	2.05		
				8.00	2	220	0.120	0.24	0.48	2.73		
				10.00	2	220	0.150	0.30	0.60	3.41		
				12.00	2	220	0.120	0.36	0.72	4.09		
				16.00	2	220	0.120	0.48	0.96	5.46		
		K	Cast iron *Guss*	3.00	2	280	0.060	0.09	0.18	1.02		
				4.00	2	280	0.080	0.12	0.24	1.36		
				5.00	2	280	0.100	0.15	0.30	1.71		
				6.00	2	280	0.090	0.18	0.36	2.05		
				8.00	2	280	0.120	0.24	0.48	2.73		
				10.00	2	280	0.150	0.30	0.60	3.41		
				12.00	2	280	0.120	0.36	0.72	4.09		
				16.00	2	280	0.120	0.48	0.96	5.46		
		H	Steel, steel alloy *Stahl, legierter Stahl* HRC=48-54	3.00	2	180	0.060	0.09	0.18	1.02		
				4.00	2	180	0.080	0.12	0.24	1.36		
				5.00	2	180	0.100	0.15	0.30	1.71		
				6.00	2	180	0.090	0.18	0.36	2.05		
				8.00	2	180	0.120	0.24	0.48	2.73		
				10.00	2	180	0.150	0.30	0.60	3.41		
				12.00	2	180	0.120	0.36	0.72	4.09		
				16.00	2	180	0.120	0.48	0.96	5.46		
			Hard steel *Gehärteter Stahl* HRC>60	3.00	2	80	0.060	0.09	0.18	1.02		
				4.00	2	80	0.080	0.12	0.24	1.36		
				5.00	2	80	0.100	0.15	0.30	1.71		
				6.00	2	80	0.090	0.18	0.36	2.05		
				8.00	2	80	0.120	0.24	0.48	2.73		
				10.00	2	80	0.150	0.30	0.60	3.41		
				12.00	2	80	0.120	0.36	0.72	4.09		
				16.00	2	80	0.120	0.48	0.96	5.46		





- Please start a test cutting with 85% of the Vc or 75% of the fz, then increase the cutting speed and feed rate.
- Please use high precision and high rigidity clamping system. The oscillation of the tool can not be over 0.01 mm.
  N = 1000Vc / d_{eff} / 3.14159
  When the rotating speed of the machine on site cannot reach the maximum rotation speed of the machine used for the calculation of the rotation speed: $V_f = f_z * n * z$ (n:actual rotation of the machine)

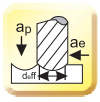
- *Bitte führen Sie einen Testschnitt mit 85% der Vc und 75% des fz durch.*
  Nach erfolgtem Test können Sie die Schnittgeschwindigkeit bzw. die Vorschubwerte entsprechend erhöhen.
- *Bitte verwenden Sie nur Spannmittel mit einer hohen Genauigkeit und einer hohen Spannkraft.*
  Überprüfen Sie den Rundlauf der Werkzeuge. Sie sollten darauf achten, dass der Rundlauffehler nicht größer als 0.01mm ist.

Sollten Sie aufgrund der Maschinendrehzahl nicht in der Lage sein, die angegebenen Drehzahlen einzuhalten, achten Sie darauf, dass Sie die Vf entsprechend anpassen. $V_f = f_z * n * z$ *(n: aktuelle Maschinendrehzahl)*

Recommended cutting data · Empfohlene Schnittdaten

Type *Typ*	Grade *Sorte*		Material *Werkstoffe*	d_1 (mm)	z	Vc (m/min)	f_z (mm/z)	a_p (mm)	a_e (mm)	d_{eff} (mm)	n (min^{-1})	V_f (mm/min)
5566R302GH	KMG405	P	Steel, steel alloy *Stahl, legierter Stahl* HRC=42-48	3.00	2	220	0.060	0.06	0.18	0.84		
				4.00	2	220	0.080	0.08	0.24	1.12		
				5.00	2	220	0.100	0.10	0.30	1.40		
				6.00	2	220	0.090	0.12	0.36	1.68		
				8.00	2	220	0.120	0.16	0.48	2.24		
				10.00	2	220	0.150	0.20	0.60	2.80		
				12.00	2	220	0.120	0.24	0.72	3.36		
		K	Cast iron *Guss*	3.00	2	280	0.060	0.06	0.18	0.84		
				4.00	2	280	0.080	0.08	0.24	1.12		
				5.00	2	280	0.100	0.10	0.30	1.40		
				6.00	2	280	0.090	0.12	0.36	1.68		
				8.00	2	280	0.120	0.16	0.48	2.24		
				10.00	2	280	0.150	0.20	0.60	2.80		
				12.00	2	280	0.120	0.24	0.72	3.36		
		H	Steel, steel alloy *Stahl, legierter Stahl* HRC=48-54	3.00	2	180	0.060	0.06	0.18	0.84		
				4.00	2	180	0.080	0.08	0.24	1.12		
				5.00	2	180	0.100	0.10	0.30	1.40		
				6.00	2	180	0.090	0.12	0.36	1.68		
				8.00	2	180	0.120	0.16	0.48	2.24		
				10.00	2	180	0.150	0.20	0.60	2.80		
				12.00	2	180	0.120	0.24	0.72	3.36		
			Hard steel *Gehärteter Stahl* HRC>60	3.00	2	80	0.060	0.06	0.18	0.84		
				4.00	2	80	0.080	0.08	0.24	1.12		
				5.00	2	80	0.100	0.10	0.30	1.40		
				6.00	2	80	0.090	0.12	0.36	1.68		
				8.00	2	80	0.120	0.16	0.48	2.24		
				10.00	2	80	0.150	0.20	0.60	2.80		
				12.00	2	80	0.120	0.24	0.72	3.36		





- Please start a test cutting with 85% of the Vc or 75% of the fz, then increase the cutting speed and feed rate.
- Please use high precision and high rigidity clamping system. The oscillation of the tool can not be over 0.01 mm.

N = 1000Vc / d_{eff} / 3.14159

When the rotating speed of the machine on site cannot reach the maximum rotation speed of the machine used for the calculation of the rotation speed: $V_f = f_z * n * z$ (n:actual rotation of the machine)

- *Bitte führen Sie einen Testschnitt mit 85% der Vc und 75% des fz durch.*
  Nach erfolgtem Test können Sie die Schnittgeschwindigkeit bzw. die Vorschubwerte entsprechend erhöhen.
- *Bitte verwenden Sie nur Spannmittel mit einer hohen Genauigkeit und einer hohen Spannkraft.*
  Überprüfen Sie den Rundlauf der Werkzeuge. Sie sollten darauf achten, dass der Rundlauffehler nicht größer als 0.01mm ist.

Sollten Sie aufgrund der Maschinendrehzahl nicht in der Lage sein, die angegebenen Drehzahlen einzuhalten, achten Sie darauf, dass Sie die Vf entsprechend anpassen. $V_f = f_z * n * z$ *(n: aktuelle Maschinendrehzahl)*

Recommended cutting data · Empfohlene Schnittdaten

Type *Typ*	Grade *Sorte*	Material *Werkstoffe*		d_1 (mm)	z	Vc (m/min)	f_z (mm/z)	a_p (mm)	a_e (mm)	n (min^{-1})	V_f (mm/min)
5585R304GHR	KMG405	P	Steel, steel alloy *Stahl, legierter Stahl* HRC<=48	6.00	4	170	0.120	0.30	0.80		
				8.00	4	170	0.150	0.40	0.90		
				10.00	4	170	0.140	0.50	1.00		
				12.00	4	170	0.170	0.60	1.10		
				16.00	4	170	0.210	0.80	1.20		
		K	Cast iron *Guss*	6.00	4	250	0.130	0.38	2.00		
				8.00	4	250	0.150	0.50	2.60		
				10.00	4	250	0.170	0.63	3.30		
				12.00	4	250	0.190	0.75	4.00		
				16.00	4	250	0.230	1.00	5.30		
		H	Steel, steel alloy *Stahl, legierter Stahl* HRC=48-52	6.00	4	150	0.120	0.30	0.80		
				8.00	4	150	0.150	0.40	0.90		
				10.00	4	150	0.140	0.50	1.00		
				12.00	4	150	0.170	0.60	1.10		
				16.00	4	150	0.210	0.80	1.20		
			Hard steel *Gehärteter Stahl* HRC=52-60	6.00	4	120	0.120	0.30	0.80		
				8.00	4	120	0.150	0.40	0.90		
				10.00	4	120	0.140	0.50	1.00		
				12.00	4	120	0.170	0.60	1.10		
				16.00	4	120	0.210	0.80	1.20		





- Please start a test cutting with 85% of the Vc or 75% of the fz, then increase the cutting speed and feed rate.
- Please use high precision and high rigidity clamping system. The oscillation of the tool can not be over 0.01 mm.

N = 1000Vc / d_{eff} / 3.14159
When the rotating speed of the machine on site cannot reach the maximum rotation speed of the machine used for the calculation of the rotation speed: $V_f = f_z * n * z$ (n:actual rotation of the machine)

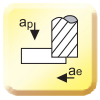
- *Bitte führen Sie einen Testschnitt mit 85% der Vc und 75% des fz durch.*
  Nach erfolgtem Test können Sie die Schnittgeschwindigkeit bzw. die Vorschubwerte entsprechend erhöhen.
- *Bitte verwenden Sie nur Spannmittel mit einer hohen Genauigkeit und einer hohen Spannkraft.*
  Überprüfen Sie den Rundlauf der Werkzeuge. Sie sollten darauf achten, dass der Rundlauffehler nicht größer als 0.01mm ist.

Sollten Sie aufgrund der Maschinendrehzahl nicht in der Lage sein, die angegebenen Drehzahlen einzuhalten, achten Sie darauf, dass Sie die Vf entsprechend anpassen. $V_f = f_z * n * z$ *(n: aktuelle Maschinendrehzahl)*

Recommended cutting data · Empfohlene Schnittdaten

Type *Typ*	Grade *Sorte*	Material *Werkstoffe*		d_1 (mm)	z	Vc (m/min)	f_z (mm/z)	a_p (mm)	a_e (mm)	n (min^{-1})	V_f (mm/min)
5586R304GHR	KMG405	P	Steel, steel alloy *Stahl, legierter Stahl* HRC<=48	6.00	4	170	0.120	0.15	0.80		
				8.00	4	170	0.150	0.20	0.90		
				10.00	4	170	0.140	0.25	1.00		
				12.00	4	170	0.170	0.30	1.10		
				16.00	4	170	0.210	0.40	1.20		
		K	Cast iron *Guss*	6.00	4	250	0.130	0.20	2.00		
				8.00	4	250	0.150	0.26	2.60		
				10.00	4	250	0.170	0.33	3.30		
				12.00	4	250	0.190	0.39	4.00		
				16.00	4	250	0.230	0.52	5.30		
		H	Steel, steel alloy *Stahl, legierter Stahl* HRC=48-52	6.00	4	150	0.120	0.15	0.80		
				8.00	4	150	0.150	0.20	0.90		
				10.00	4	150	0.140	0.25	1.00		
				12.00	4	150	0.170	0.30	1.10		
				16.00	4	150	0.210	0.40	1.20		
			Hard steel *Gehärteter Stahl* HRC=52-60	6.00	4	120	0.120	0.15	0.80		
				8.00	4	120	0.150	0.20	0.90		
				10.00	4	120	0.140	0.25	1.00		
				12.00	4	120	0.170	0.30	1.10		
				16.00	4	120	0.210	0.40	1.20		





- Please start a test cutting with 85% of the Vc or 75% of the fz, then increase the cutting speed and feed rate.
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N = 1000Vc / deff / 3.14159

When the rotating speed of the machine on site cannot reach the maximum rotation speed of the machine used for the calculation of the rotation speed: $V_f = f_z * n * z$ (n:actual rotation of the machine)

- *Bitte führen Sie einen Testschnitt mit 85% der Vc und 75% des fz durch.*
  Nach erfolgtem Test können Sie die Schnittgeschwindigkeit bzw. die Vorschubwerte entsprechend erhöhen.
- *Bitte verwenden Sie nur Spannmittel mit einer hohen Genauigkeit und einer hohen Spannkraft.*
  Überprüfen Sie den Rundlauf der Werkzeuge. Sie sollten darauf achten, dass der Rundlauffehler nicht größer als 0.01mm ist.

Sollten Sie aufgrund der Maschinendrehzahl nicht in der Lage sein, die angegebenen Drehzahlen einzuhalten, achten Sie darauf, dass Sie die Vf entsprechend anpassen. $V_f = f_z * n * z$ *(n: aktuelle Maschinendrehzahl)*

Recommended cutting data · Empfohlene Schnittdaten

Type *Typ*	Grade *Sorte*	Material *Werkstoffe*		d_1 (mm)	z	Vc (m/min)	f_z (mm/z)	a_p (mm)	a_e (mm)	d_{eff} (mm)	n (min^{-1})	V_f (mm/min)
5565R302HH	KMG405	K	Cast iron *Guss*	3	2	280	0.060	0.09	0.18	1.02		
				4	2	280	0.080	0.12	0.24	1.36		
				5	2	280	0.100	0.15	0.30	1.71		
				6	2	280	0.090	0.18	0.36	2.05		
				8	2	280	0.120	0.24	0.48	2.73		
				10	2	280	0.150	0.30	0.60	3.41		
				12	2	280	0.120	0.36	0.72	4.09		
				16	2	280	0.120	0.48	0.96	5.46		
		H	Hard steel *Gehärteter Stahl* HRC=48-54	3	2	180	0.060	0.09	0.18	1.02		
				4	2	180	0.080	0.12	0.24	1.36		
				5	2	180	0.100	0.15	0.30	1.71		
				6	2	180	0.090	0.18	0.36	2.05		
				8	2	180	0.120	0.24	0.48	2.73		
				10	2	180	0.150	0.30	0.60	3.41		
				12	2	180	0.120	0.36	0.72	4.09		
				16	2	180	0.120	0.48	0.96	5.46		
			Hard steel *Gehärteter Stahl* HRC>60	3	2	80	0.060	0.09	0.18	1.02		
				4	2	80	0.080	0.12	0.24	1.36		
				5	2	80	0.100	0.15	0.30	1.71		
				6	2	80	0.090	0.18	0.36	2.05		
				8	2	80	0.120	0.24	0.48	2.73		
				10	2	80	0.150	0.30	0.60	3.41		
				12	2	80	0.120	0.36	0.72	4.09		
				16	2	80	0.120	0.48	0.96	5.46		



- Please start a test cutting with 85% of the Vc or 75% of the fz, then increase the cutting speed and feed rate.
- Please use high precision and high rigidity clamping system. The oscillation of the tool can not be over 0.01 mm.

$N = 1000Vc / d_{eff} / 3.14159$

When the rotating speed of the machine on site cannot reach the maximum rotation speed of the machine used for the calculation of the rotation speed: $V_f = f_z * n * z$ (n:actual rotation of the machine)

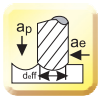
- *Bitte führen Sie einen Testschnitt mit 85% der Vc und 75% des fz durch.*
  Nach erfolgtem Test können Sie die Schnittgeschwindigkeit bzw. die Vorschubwerte entsprechend erhöhen.
- *Bitte verwenden Sie nur Spannmittel mit einer hohen Genauigkeit und einer hohen Spannkraft.*
  Überprüfen Sie den Rundlauf der Werkzeuge. Sie sollten darauf achten, dass der Rundlauffehler nicht größer als 0.01mm ist.

Sollten Sie aufgrund der Maschinendrehzahl nicht in der Lage sein, die angegebenen Drehzahlen einzuhalten, achten Sie darauf, dass Sie die Vf entsprechend anpassen. $V_f = f_z * n * z$ *(n: aktuelle Maschinendrehzahl)*

Recommended cutting data · Empfohlene Schnittdaten

Type *Typ*	Grade *Sorte*	Material *Werkstoffe*		d_1 (mm)	z	Vc (m/min)	f_z (mm/z)	a_p (mm)	a_e (mm)	d_{eff} (mm)	n (min^{-1})	V_f (mm/min)
5566R302HH	KMG405	K	Cast iron *Guss*	3	2	280	0.060	0.06	0.18	0.84		
5502R55MHH	KMG555			4	2	280	0.080	0.08	0.24	1.12		
				5	2	280	0.100	0.10	0.30	1.40		
				6	2	280	0.090	0.12	0.36	1.68		
				8	2	280	0.120	0.16	0.48	2.24		
				10	2	280	0.150	0.20	0.60	2.80		
				12	2	280	0.120	0.24	0.72	3.36		
		H	Hard steel *Gehärteter Stahl* HRC=48-54	3	2	180	0.060	0.06	0.18	0.84		
				4	2	180	0.080	0.08	0.24	1.12		
				5	2	180	0.100	0.10	0.30	1.40		
				6	2	180	0.090	0.12	0.36	1.68		
				8	2	180	0.120	0.16	0.48	2.24		
				10	2	180	0.150	0.20	0.60	2.80		
				12	2	180	0.120	0.24	0.72	3.36		
			Hard steel *Gehärteter Stahl* HRC>60	3	2	80	0.060	0.06	0.18	0.84		
				4	2	80	0.080	0.08	0.24	1.12		
				5	2	80	0.100	0.10	0.30	1.40		
				6	2	80	0.090	0.12	0.36	1.68		
				8	2	80	0.120	0.16	0.48	2.24		
				10	2	80	0.150	0.20	0.60	2.80		
				12	2	80	0.120	0.24	0.72	3.36		





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N = 1000Vc / d_{eff} / 3.14159

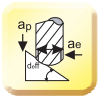
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- *Bitte führen Sie einen Testschnitt mit 85% der Vc und 75% des fz durch.*
  Nach erfolgtem Test können Sie die Schnittgeschwindigkeit bzw. die Vorschubwerte entsprechend erhöhen.
- *Bitte verwenden Sie nur Spannmittel mit einer hohen Genauigkeit und einer hohen Spannkraft.*
  Überprüfen Sie den Rundlauf der Werkzeuge. Sie sollten darauf achten, dass der Rundlauffehler nicht größer als 0.01mm ist.

Sollten Sie aufgrund der Maschinendrehzahl nicht in der Lage sein, die angegebenen Drehzahlen einzuhalten, achten Sie darauf, dass Sie die Vf entsprechend anpassen. $V_f = f_z * n * z$ *(n: aktuelle Maschinendrehzahl)*

Recommended cutting data · Empfohlene Schnittdaten

Type *Typ*	Grade *Sorte*		Material *Werkstoffe*	d_1 (mm)	z	Vc (m/min)	f_z (mm/z)	a_p (mm)	a_e (mm)	d_{eff} (mm)	n (min^{-1})	V_f (mm/min)
5566R304HH	KMG405	P	Steel, steel alloy *Stahl, legierter Stahl* HRC=42-48	6.00	4	430	0.090	0.18	0.09	4.59		
				8.00	4	430	0.120	0.24	0.12	6.12		
				10.00	4	430	0.150	0.30	0.15	7.65		
				12.00	4	430	0.120	0.72	0.12	10.22		
		K	Cast iron *Guss*	6.00	4	550	0.090	0.18	0.09	4.59		
				8.00	4	550	0.120	0.24	0.12	6.12		
				10.00	4	550	0.150	0.30	0.15	7.65		
				12.00	4	550	0.120	0.72	0.12	10.22		
		H	Steel, steel alloy *Stahl, legierter Stahl* HRC=48-54	6.00	4	350	0.090	0.18	0.09	4.59		
				8.00	4	350	0.120	0.24	0.12	6.12		
				10.00	4	350	0.150	0.30	0.15	7.65		
				12.00	4	350	0.120	0.72	0.12	10.22		
			Hard steel *Gehärteter Stahl* HRC>60	6.00	4	100	0.090	0.18	0.09	4.59		
				8.00	4	100	0.120	0.24	0.12	6.12		
				10.00	4	100	0.150	0.30	0.15	7.65		
				12.00	4	100	0.120	0.72	0.12	10.22		



- Please start a test cutting with 85% of the Vc or 75% of the fz, then increase the cutting speed and feed rate.
- Please use high precision and high rigidity clamping system. The oscillation of the tool can not be over 0.01 mm.

N = 1000Vc / d_{eff} / 3.14159

When the rotating speed of the machine on site cannot reach the maximum rotation speed of the machine used for the calculation of the rotation speed: $V_f = f_z * n * z$ (n:actual rotation of the machine)

- *Bitte führen Sie einen Testschnitt mit 85% der Vc und 75% des fz durch. Nach erfolgtem Test können Sie die Schnittgeschwindigkeit bzw. die Vorschubwerte entsprechend erhöhen.*
- *Bitte verwenden Sie nur Spannmittel mit einer hohen Genauigkeit und einer hohen Spannkraft. Überprüfen Sie den Rundlauf der Werkzeuge. Sie sollten darauf achten, dass der Rundlauffehler nicht größer als 0.01mm ist.*

Sollten Sie aufgrund der Maschinendrehzahl nicht in der Lage sein, die angegebenen Drehzahlen einzuhalten, achten Sie darauf, dass Sie die Vf entsprechend anpassen. $V_f = f_z * n * z$ *(n: aktuelle Maschinendrehzahl)*

Recommended cutting data · Empfohlene Schnittdaten

Type *Typ*	Grade *Sorte*	Material *Werkstoffe*		d_1 (mm)	z	Vc (m/min)	f_z (mm/z)	a_p (mm)	a_e (mm)	n (min^{-1})	V_f (mm/min)
5502R55MHH	KMG405	P	Steel, steel alloy *Stahl, legierter Stahl* HRC=42-48	3.00	4	150	0.010	4.50	0.10		
				4.00	4	150	0.015	6.00	0.10		
				5.00	5	150	0.020	7.50	0.10		
				6.00	6	150	0.025	9.00	0.10		
				8.00	6	150	0.032	12.00	0.10		
				10.00	6	150	0.039	15.00	0.10		
				12.00	6	150	0.048	18.00	0.10		
				16.00	6	150	0.058	24.00	0.20		
				20.00	8	150	0.073	30.00	0.20		
		H	Steel, steel alloy *Stahl, legierter Stahl* HRC=48-54	3.00	4	80	0.010	4.50	0.10		
				4.00	4	80	0.015	6.00	0.10		
				5.00	5	80	0.020	7.50	0.10		
				6.00	6	80	0.025	9.00	0.10		
				8.00	6	80	0.032	12.00	0.10		
				10.00	6	80	0.039	15.00	0.10		
				12.00	6	80	0.048	18.00	0.10		
				16.00	6	80	0.058	24.00	0.20		
				20.00	8	80	0.073	30.00	0.20		
			Hard steel *Gehärteter Stahl* HRC>60	3.00	4	30	0.010	4.50	0.10		
				4.00	4	30	0.010	6.00	0.10		
				5.00	5	30	0.014	7.50	0.10		
				6.00	6	30	0.017	9.00	0.10		
				8.00	6	30	0.024	12.00	0.10		
				10.00	6	30	0.030	15.00	0.10		
				12.00	6	30	0.036	18.00	0.10		
				16.00	6	30	0.045	24.00	0.20		
				20.00	8	30	0.057	30.00	0.20		



- Please start a test cutting with 85% of the Vc or 75% of the fz, then increase the cutting speed and feed rate.
- Please use high precision and high rigidity clamping system. The oscillation of the tool can not be over 0.01 mm.

N = 1000Vc / d_{eff} / 3.14159

When the rotating speed of the machine on site cannot reach the maximum rotation speed of the machine used for the calculation of the rotation speed: $V_f = f_z * n * z$ (n:actual rotation of the machine)

- *Bitte führen Sie einen Testschnitt mit 85% der Vc und 75% des fz durch.*
  Nach erfolgtem Test können Sie die Schnittgeschwindigkeit bzw. die Vorschubwerte entsprechend erhöhen.
- *Bitte verwenden Sie nur Spannmittel mit einer hohen Genauigkeit und einer hohen Spannkraft.*
  Überprüfen Sie den Rundlauf der Werkzeuge. Sie sollten darauf achten, dass der Rundlauffehler nicht größer als 0.01mm ist.

Sollten Sie aufgrund der Maschinendrehzahl nicht in der Lage sein, die angegebenen Drehzahlen einzuhalten, achten Sie darauf, dass Sie die Vf entsprechend anpassen. $V_f = f_z * n * z$ *(n: aktuelle Maschinendrehzahl)*

Recommended cutting data · Empfohlene Schnittdaten

Type *Typ*	Grade *Sorte*		Material *Werkstoffe*	d_1 (mm)	z	r (mm)	Vc (m/min)	f_z (mm/z)	a_p (mm)	a_e (mm)	n (min^{-1})	V_f (mm/min)
5585R554HHR	KMG405	P	Steel, steel alloy *Stahl, legierter Stahl* HRC=40-48	6	4	1.5	150	0.120	0.30	1.5	7950	3816
				8	4	2.0	150	0.150	0.40	4.0	5960	3576
				10	4	2.5	150	0.140	0.50	5.0	4770	2671
				12	4	3.0	150	0.170	0.60	6.0	3970	2700
				16	4	4.0	150	0.210	0.80	8.0	2980	2503
		H	Hard steel *Gehärteter Stahl* HRC=50-54	6	4	1.5	120	0.120	0.30	1.5	6360	3053
				8	4	2.0	120	0.150	0.40	4.0	4770	2862
				10	4	2.5	120	0.140	0.50	5.0	3810	2134
				12	4	3.0	120	0.170	0.60	6.0	3180	2162
				16	4	4.0	120	0.210	0.80	8.0	2380	1999
		H	Hard steel *Gehärteter Stahl* HRC>60	6	4	1.5	50	0.12	0.3	0.6	2653	1273
				8	4	2.0	50	0.15	0.4	0.8	1989	1194
				10	4	2.5	50	0.14	0.5	1.0	1592	891
				12	4	3.0	50	0.17	0.6	1.2	1326	902
				16	4	4.0	50	0.21	0.8	1.6	995	836
		P	Hard steel *Gehärteter Stahl* HRC=40-48	6	4	0.3	100	0.055	6	1.2	5305	1167
				8	4	0.3	100	0.075	8	1.6	3979	1194
				10	4	0.5	100	0.090	10	2.0	3183	1146
				12	4	0.5	100	0.110	12	2.4	2653	1167
				16	4	1.0	100	0.145	16	3.2	1989	1154
		H	Hard steel *Gehärteter Stahl* HRC=50-54	6	4	0.3	50	0.055	6	1.2	2653	584
				8	4	0.3	50	0.075	8	1.6	1989	597
				10	4	0.5	50	0.090	10	2.0	1592	573
				12	4	0.5	50	0.110	12	2.4	1326	584
				16	4	1.0	50	0.145	16	3.2	995	577







- Please start a test cutting with 85% of the Vc or 75% of the fz, then increase the cutting speed and feed rate.
- Please use high precision and high rigidity clamping system. The oscillation of the tool can not be over 0.01 mm.
  N = 1000Vc / d_{eff} / 3.14159
  When the rotating speed of the machine on site cannot reach the maximum rotation speed of the machine used for the calculation of the rotation speed: $V_f = f_z * n * z$ (n:actual rotation of the machine)

- *Bitte führen Sie einen Testschnitt mit 85% der Vc und 75% des fz durch.*
  Nach erfolgtem Test können Sie die Schnittgeschwindigkeit bzw. die Vorschubwerte entsprechend erhöhen.
- *Bitte verwenden Sie nur Spannmittel mit einer hohen Genauigkeit und einer hohen Spannkraft.*
  Überprüfen Sie den Rundlauf der Werkzeuge. Sie sollten darauf achten, dass der Rundlauffehler nicht größer als 0.01mm ist.

Sollten Sie aufgrund der Maschinendrehzahl nicht in der Lage sein, die angegebenen Drehzahlen einzuhalten, achten Sie darauf, dass Sie die Vf entsprechend anpassen. $V_f = f_z * n * z$ *(n: aktuelle Maschinendrehzahl)*

Recommended cutting data · Empfohlene Schnittdaten

Type *Typ*	Grade *Sorte*	Material *Werkstoffe*		d1 (mm)	z	r (mm)	Vc (m/min)	fz (mm/z)	ap (mm)	ae (mm)	n (min-1)	Vf (mm/min)
5586R554HHR	KMG405	P	Steel, steel alloy *Stahl, legierter Stahl* HRC=40-48	6	4	1.5	120	0.120	0.3	1.5	6366	3056
				8	4	2.0	120	0.150	0.4	4.0	4775	2865
				10	4	2.5	120	0.140	0.5	5.0	3820	2139
				12	4	3.0	120	0.170	0.6	6.0	3183	2165
				16	4	4.0	120	0.210	0.8	8.0	2387	2005
		H	Hard steel *Gehärteter Stahl* HRC=50-54	6	4	1.5	100	0.120	0.3	1.5	5305	2546
				8	4	2.0	100	0.150	0.4	4.0	3979	2387
				10	4	2.5	100	0.140	0.5	5.0	3183	1783
				12	4	3.0	100	0.170	0.6	6.0	2653	1804
				16	4	4.0	100	0.210	0.8	8.0	1989	1671
			Hard steel *Gehärteter Stahl* HRC>60	6	4	1.5	40	0.120	0.3	1.5	2122	1019
				8	4	2.0	40	0.150	0.4	4.0	1592	955
				10	4	2.5	40	0.140	0.5	5.0	1273	713
				12	4	3.0	40	0.170	0.6	6.0	1061	722
				16	4	4.0	40	0.210	0.8	8.0	796	668
		P	Hard steel *Gehärteter Stahl* HRC=40-48	6	4	0.3	90	0.055	6	1.2	4775	1050
				8	4	0.3	90	0.075	8	1.6	3581	1074
				10	4	0.5	90	0.090	10	2.0	2865	1031
				12	4	0.5	90	0.110	12	2.4	2387	1050
				16	4	1.0	90	0.145	16	3.2	1790	1038
		H	Hard steel *Gehärteter Stahl* HRC=50-54	6	4	0.3	45	0.055	6	1.2	2387	525
				8	4	0.3	45	0.075	8	1.6	1790	537
				10	4	0.5	45	0.090	10	2.0	1432	516
				12	4	0.5	45	0.110	12	2.4	1194	525
				16	4	1.0	45	0.145	16	3.2	895	519

- Please start a test cutting with 85% of the Vc or 75% of the fz, then increase the cutting speed and feed rate.
- Please use high precision and high rigidity clamping system. The oscillation of the tool can not be over 0.01 mm.

N = 1000Vc / d_{eff} / 3.14159

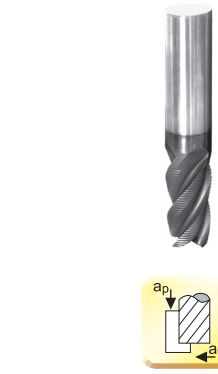
When the rotating speed of the machine on site cannot reach the maximum rotation speed of the machine used for the calculation of the rotation speed: $V_f = f_z * n * z$ (n:actual rotation of the machine)

- *Bitte führen Sie einen Testschnitt mit 85% der Vc und 75% des fz durch.*
  Nach erfolgtem Test können Sie die Schnittgeschwindigkeit bzw. die Vorschubwerte entsprechend erhöhen.
- *Bitte verwenden Sie nur Spannmittel mit einer hohen Genauigkeit und einer hohen Spannkraft.*
  Überprüfen Sie den Rundlauf der Werkzeuge. Sie sollten darauf achten, dass der Rundlauffehler nicht größer als 0.01mm ist.

Sollten Sie aufgrund der Maschinendrehzahl nicht in der Lage sein, die angegebenen Drehzahlen einzuhalten, achten Sie darauf, dass Sie die Vf entsprechend anpassen. $V_f = f_z * n * z$ *(n: aktuelle Maschinendrehzahl)*

Recommended cutting data · Empfohlene Schnittdaten

Type *Typ*	Grade *Sorte*		Material *Werkstoffe*	d_1 (mm)	z	Vc (m/min)	f_z (mm/z)	a_p (mm)	a_e (mm)	n (min^{-1})	V_f (mm/min)
5602R304GR	KMG303	P	Steel *Stahl* HRC<=32	10	4	100	0.040	10	5	3183	509
				12	4	100	0.050	12	6	2653	531
				16	4	100	0.065	16	8	1989	517
				20	4	100	0.080	20	10	1592	509
			Steel,steel alloy *Stahl, legierter Stahl* HRC=32-38	10	4	80	0.035	10	5	2546	357
				12	4	80	0.045	12	6	2122	382
				16	4	80	0.060	16	8	1592	382
				20	4	80	0.070	20	10	1273	357
		K	Cast iron *Guss*	10	4	120	0.045	10	5	3820	688
				12	4	120	0.055	12	6	3183	700
				16	4	120	0.070	16	8	2387	668
				20	4	120	0.090	20	10	1910	688
		S	Ti and Ti alloys *Ti und Ti-Legierung*	10	4	30	0.035	10	5	955	134
				12	4	30	0.045	12	6	796	143
				16	4	30	0.060	16	8	597	143
				20	4	30	0.070	20	10	477	134

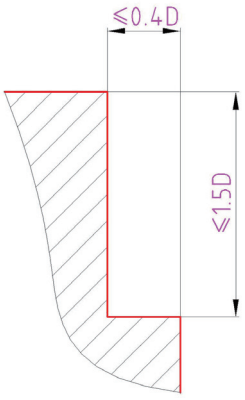
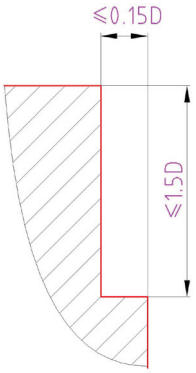
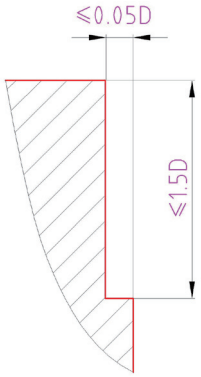


- Please start a test cutting with 85% of the Vc or 75% of the fz, then increase the cutting speed and feed rate.
- Please use high precision and high rigidity clamping system. The oscillation of the tool can not be over 0.01 mm.
- When a_p=1*d_1, f_z =75% as the data in the table
- When HRC>=30, reduce the a_p or a_c
- Recommended operation: climb milling

- *Bitte führen Sie einen Testschnitt mit 85% der Vc und 75% des fz durch.*
  Nach erfolgtem Test können Sie die Schnittgeschwindigkeit bzw. die Vorschubwerte entsprechend erhöhen.
- *Bitte verwenden Sie nur Spannmittel mit einer hohen Genauigkeit und einer hohen Spannkraft.*
  Überprüfen Sie den Rundlauf der Werkzeuge. Sie sollten darauf achten, dass der Rundlauffehler nicht größer als 0.01mm ist.
- *Bei Fräsoperationen, die mit einer* a_p=1*d_1 durchgeführt werden, ist f_z um 25% zu reduzieren.
- *Wenn HRC>=30, reduzieren Sie* a_p *oder* a_c
- *Empfohlene Fräsmethode: Gleichlauffräsen*

Recommended cutting data · Empfohlene Schnittdaten

5501R38414GM | 5502R38414GM | 5602R38414GM

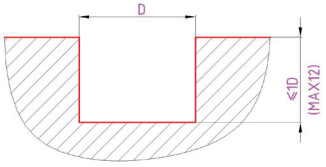
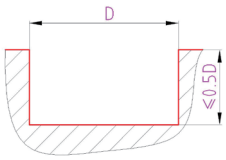
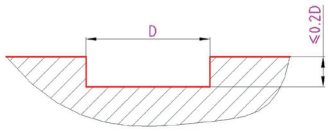
Workpiece material Werstück -material	Carbon steel, Alloy steel Kohlenstoffstahl Leg. Stahl ~30HRC		Alloy steel,Tool steel, Pre-hardened steel Leg. Stahl, Vergüteter Stahl 30 ~ 45HRC		Austenitic Stainless steel, Titanium alloy Austenitischer rostfreier Stahl, Titan-Legier.		hardened steel Gehärteter Stahl 45 ~ 55 HRC		Heat resist. super alloy Warmfeste Superlegierung.	
Diameter Ø (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)
4	10000	1800	10000	1800	6800	1080	4800	384	2800	224
5	8000	1760	8000	1760	5500	1100	3800	380	2200	220
6	7000	1960	7000	1960	4600	1120	3200	384	1900	228
8	5000	1400	5000	1400	3400	800	2400	384	1400	168
10	4000	1200	4000	1200	2700	680	1900	380	1100	144
12	3500	1040	3500	1040	2300	640	1600	320	900	136
14	3000	1020	3000	1020	2000	560	1400	308	800	120
16	2600	920	2600	920	1700	480	1200	288	700	116
18	2300	840	2300	840	1500	420	1100	308	620	100
20	2100	760	2100	760	1400	440	1000	320	560	96
Max. cutting depth max Schnitttiefe										

1. The above table shows the standard value of side milling.
2. Please select high precise machine and tool holder.
3. Please use air blow or cutting liquid with high mist retardant property.
4. Down milling is recommended in side milling.
5. Vibration and unusual noise may be generated if the machine rigidity and workpiece fixture stability is low, please reduce the rotating speed and feed rate like mentioned above.
6. Make overhang as short as possible if no interference.

1. Die obige Tabelle zeigt Standard Werte für das Eckfräsen.
2. Bitte präzise Maschinen und Werkzeughalter verwenden.
3. Bitte Luftkühlung oder Schneidflüssigkeit benutzen.
4. Empfohlene Fräsmethode: Gleichlauffräsen.
5. Bei Vibrationen oder unüblichen Geräuschen reduzieren Sie die Schnittdaten (wie oben empfohlen) entsprechend.
6. Werkzeugauskragung so kurz wie möglich wählen.

Recommended cutting data · Empfohlene Schnittdaten

5501R38414GM | 5502R38414GM | 5602R38414GM

Workpiece material Werstück -material	Carbon steel, Alloy steel Kohlenstoffstahl Leg. Stahl ~30HRC		Alloy steel,Tool steel, Pre-hardened steel Leg. Stahl, Vergüteter Stahl 30 ~ 45HRC		Austenitic Stainless steel, Titanium alloy Austenitischer rostfreier Stahl, Titan-Legier.		hardened steel Gehärteter Stahl 45 ~ 55 HRC		Heat resist. super alloy Warmfeste Superlegierung	
Diameter Ø (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)
4	8400	1000	4800	480	4800	480	2100	160	2100	160
5	6700	1080	3800	480	3800	480	1700	140	1700	140
6	5600	1120	3200	520	3200	520	1400	140	1400	140
8	4200	1000	2400	480	2400	480	1000	120	1000	120
10	3300	800	1900	400	1900	400	800	120	800	120
12	2800	720	1600	360	1600	360	700	120	700	120
14	2400	640	1400	320	1400	320	600	96	600	96
16	2100	600	1200	280	1200	280	500	80	500	80
18	1900	520	1100	280	1100	280	500	80	500	80
20	1700	560	1000	240	1000	240	400	80	400	80
Max. cutting depth max Schnittiefe										

1. The above table shows the standard value of slot milling..
2. Please select high precise machine and tool holder.
3. Please use air blow or cutting liquid with high mist retardant property.
4. Down milling is recommended in side milling.
5. Vibration and unusual noise may be generated if the machine rigidity and workpiece fixture stability is low, please reduce the rotating speed and feed rate like mentioned above.
6. Make overhang as short as possible if no interference.

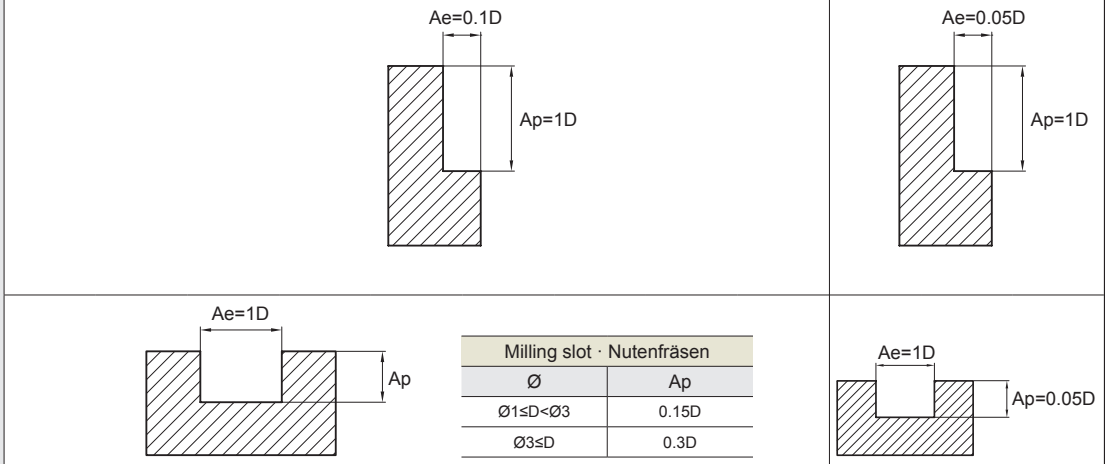
1. Die obige Tabelle zeigt Standard Werte für das Nutenfräsen.
2. Bitte präzise Maschinen und Werkzeughalter verwenden.
3. Bitte Luftkühlung oder Schneidflüssigkeit benutzen.
4. Empfohlene Fräsmethode: Gleichlauffräsen.
5. Bei Vibrationen oder unüblichen Geräuschen reduzieren Sie die Schnittdaten (wie oben empfohlen) entsprechend.
6. Werkzeugauskragung so kurz wie möglich wählen.

Recommended cutting data · Empfohlene Schnittdaten

GM-2E | GM-2EL

Workpiece material Werkstückstoff	Cast iron, Nodular cast iron Grauguss GGG Grauguss GGG		Carbon steel, Alloy steel Kohlenstoffstahl Leg. Stahl ~750N/mm²		Carbon steel, Alloy steel Kohlenstoffstahl Leg. Stahl ~30HRC		Pre-hardened steel, Quenched and tempered steel Vergüteter Stahl ~40HRC		Stainless steel · Rostfreier Stahl		Pre-hardened steel, Quenched and tempered steel Vergüteter Stahl ~50HRC	
Diameter Ø (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)
1	20000	165	20000	165	20000	135	20000	135	20000	50	20000	100
2	15000	265	15000	265	15000	240	15000	235	11150	70	13000	150
3	14000	455	14000	455	13000	420	10600	350	7500	100	8500	275
4	10800	465	10800	465	10000	430	8000	355	5500	110	6500	280
5	8200	485	8200	485	7600	450	6400	370	4500	110	5000	295
6	7000	500	7000	500	6400	460	5300	385	3700	115	4200	300
8	5200	495	5200	495	4800	455	4000	380	2800	115	3200	305
10	4200	485	4200	485	3800	450	3200	370	2200	115	2500	290
12	3500	485	3500	485	3200	450	2650	370	1850	115	2100	290
14	3000	455	3000	455	2700	420	2300	350	1600	110	1800	275
16	2600	455	2600	455	2400	420	2000	350	1400	100	1600	275
18	2300	445	2300	445	2100	410	1800	345	1250	100	1400	270
20	2050	445	2050	445	1900	410	1600	345	1100	100	1250	270

Max. cutting depth
max Schnitttiefe



Milling slot · Nutenfräsen	
Ø	Ap
Ø1≤D<Ø3	0.15D
Ø3≤D	0.3D

1. The above table shows the standard value of side milling. When slot milling, of rotating speed 50%~70% and feed rate like mentioned above 40%~60%.
2. Please select high precise machine and tool holder.
3. Please use air blow or cutting liquid with high mist retardant property.
4. Down milling is recommended in side milling.
5. Vibration and unusual noise may be generated if the machine rigidity and workpiece fixture stability is low, please reduce the rotating speed and feed rate like mentioned above.
6. Make overhang as short as possible if no interference.

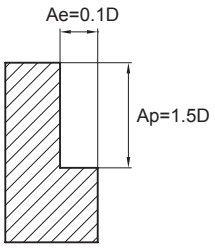
1. Die obige Tabelle zeigt Standard Werte für das Eckfräsen. Bei Nutenfräsen, Schnittgeschwindigkeit auf 50-70% und den Vorschub auf 40-60% reduzieren.
2. Bitte präzise Maschinen und Werkzeughalter verwenden.
3. Bitte Luftkühlung oder Schneidflüssigkeit benutzen.
4. Empfohlene Fräsmethode: Gleichlauffräsen.
5. Bei Vibrationen oder unüblichen Geräuschen reduzieren Sie die Schnittdaten (wie oben empfohlen) entsprechend.
6. Werkzeugauskragung so kurz wie möglich wählen.

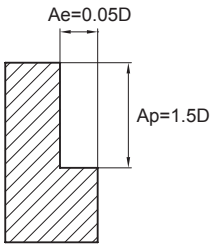
Recommended cutting data · Empfohlene Schnittdaten

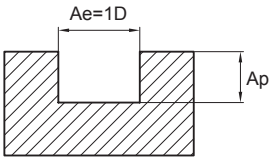
GM-4E | GM-4EL

Workpiece material Werkstückstoff	Cast iron, Nodular cast iron Grauguss GGG		Carbon steel, Alloy steel Kohlenstoffstahl Leg. Stahl ~750N/mm²		Carbon steel, Alloy steel Kohlenstoffstahl Leg. Stahl ~30HRC		Pre-hardened steel, Quenched and tempered steel Vergüteter Stahl ~40HRC		Stainless steel · Rostfreier Stahl		Pre-hardened steel, Quenched and tempered steel Vergüteter Stahl ~50HRC	
Diameter Ø (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)
1	20000	250	20000	250	20000	200	20000	200	20000	90	20000	150
2	15000	400	15000	400	15000	360	15000	350	11150	100	13000	225
3	14000	680	14000	680	13000	630	10600	525	7500	120	8500	410
4	10800	700	10800	700	10000	640	8000	535	5500	125	6500	420
5	8200	730	8200	730	7600	670	6400	560	4500	125	5000	440
6	7000	750	7000	750	6400	690	5300	575	3700	135	4200	450
8	5200	740	5200	740	4800	680	4000	565	2800	135	3200	460
10	4200	730	4200	730	3800	670	3200	560	2200	135	2500	435
12	3500	730	3500	730	3200	670	2650	560	1850	135	2100	435
14	3000	680	3000	680	2700	630	2300	525	1600	125	1800	410
16	2600	680	2600	680	2400	630	2000	525	1400	120	1600	410
18	2300	670	2300	670	2100	620	1800	515	1250	105	1400	405
20	2050	670	2050	670	1900	620	1600	515	1100	105	1250	405

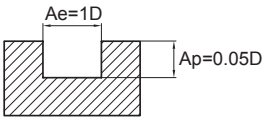
Max. cutting depth
max Schnitttiefe







Milling slot · Nutenfräsen	
Ø	Ap
Ø1≤D<Ø3	0.15D
Ø3≤D	0.3D

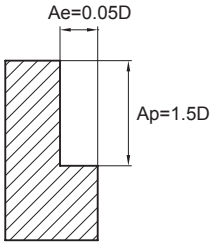


1. The above table shows the standard value of side milling. When slot milling, of rotating speed 50%~70% and feed rate like mentioned above 40%~60%.
2. Please select high precise machine and tool holder.
3. Please use air blow or cutting liquid with high mist retardant property.
4. Down milling is recommended in side milling.
5. Vibration and unusual noise may be generated if the machine rigidity and workpiece fixture stability is low, please reduce the rotating speed and feed rate like mentioned above.
6. Make overhang as short as possible if no interference.

1. Die obige Tabelle zeigt Standard Werte für das Eckfräsen. Bei Nutenfräsen, Schnittgeschwindigkeit auf 50-70% und den Vorschub auf 40-60% reduzieren.
2. Bitte präzise Maschinen und Werkzeughalter verwenden.
3. Bitte Luftkühlung oder Schneidflüssigkeit benutzen.
4. Empfohlene Fräsmethode: Gleichlauffräsen.
5. Bei Vibrationen oder unüblichen Geräuschen reduzieren Sie die Schnittdaten (wie oben empfohlen) entsprechend.
6. Werkzeugauskragung so kurz wie möglich wählen.

Recommended cutting data · Empfohlene Schnittdaten

GM-6E

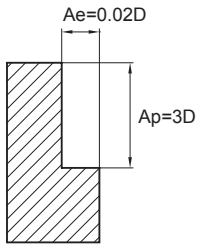
Workpiece material Werkstückstoff	Cast iron, Nodular cast iron Grauguss GGG		Carbon steel, Alloy steel Kohlenstoffstahl Leg. Stahl ~750N/mm²		Carbon steel, Alloy steel Kohlenstoffstahl Leg. Stahl ~30HRC		Pre-hardened steel, Quenched and tempered steel Vergüteter Stahl ~40HRC		Stainless steel · Rostfreier Stahl		Pre-hardened steel, Quenched and tempered steel Vergüteter Stahl ~50HRC	
Diameter Ø (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)
6	7000	890	7000	890	6400	820	5300	680	3700	160	4200	540
8	5200	890	5200	890	4800	820	4000	680	2800	160	3200	550
10	4200	860	4200	860	3800	800	3200	665	2200	160	2500	520
12	3500	860	3500	860	3200	800	2650	665	1850	160	2100	520
14	3000	810	3000	810	2700	750	2300	625	1600	150	1800	490
16	2600	810	2600	810	2400	750	2000	625	1400	150	1600	490
18	2300	800	2300	800	2100	740	1800	615	1250	125	1400	485
20	2050	800	2050	800	1900	740	1600	615	1100	125	1250	485
Max. cutting depth max Schnitttiefe												

1.Please select high precise machine and tool holder.
2.Please use air blow or MQL(minimum oil mist cooling).
3.Down milling is recommended in side milling.
4.Vibration and unusual noise may be generated if the machine rigidity and workpiece fixture stability is low, please reduce the rotating speed and feed rate like mentioned above.
5.Make overhang as short as possible if no interference.

1. Bitte präzise Maschinen und Werkzeughalter verwenden.
2. Als Kühlmittel bitte Luft oder MQL (Minimalmengen) verwenden.
3. Empfohlene Fräsmethode: Gleichlauffräsen.
4. Bei Vibrationen oder unüblichen Geräuschen reduzieren Sie die Schnittdaten (wie oben empfohlen) entsprechend.
5. Werkzeugauskragung so kurz wie möglich wählen.

Recommended cutting data · Empfohlene Schnittdaten

GM-6EL

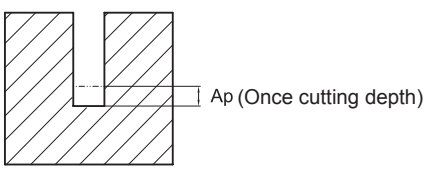
Workpiece material Werkstückstoff	Cast iron, Nodular cast iron Grauguss GGG		Carbon steel, Alloy steel Kohlenstoffstahl Leg. Stahl ~750N/mm²		Carbon steel, Alloy steel Kohlenstoffstahl Leg. Stahl ~30HRC		Pre-hardened steel, Quenched and tempered steel Vergüteter Stahl ~40HRC		Stainless steel · Rostfreier Stahl		Pre-hardened steel, Quenched and tempered steel ~50HRC	
Diameter Ø (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)
6	5800	750	5800	750	5300	685	4250	545	2650	115	3600	460
8	4400	750	4400	750	4000	685	3180	545	2000	115	2700	465
10	3500	730	3500	730	3200	665	2550	530	1600	115	2150	440
12	2900	730	2900	730	2650	665	2120	530	1350	115	1800	440
14	2500	685	2500	685	2300	625	1820	500	1150	105	1550	415
16	2200	685	2200	685	2000	625	1590	500	1000	105	1350	415
18	1950	675	1950	675	1800	615	1420	490	900	90	1200	410
20	1750	675	1750	675	1600	615	1270	490	800	90	1050	410
max. cutting depth max Schnitttiefe												

1.Please select high precise machine and tool holder.
2.Please use air blow or MQL(minimum oil mist cooling).
3.Down milling is recommended in side milling.
4.Vibration and unusual noise may be generated if the machine rigidity and workpiece fixture stability is low, please reduce the rotating speed and feed rate like mentioned above.
5.Make overhang as short as possible if no interference.

1. Bitte präzise Maschinen und Werkzeughalter verwenden.
2. Als Kühlmittel bitte Luft oder MQL (Minimalmengen) verwenden.
3. Empfohlene Fräsmethode: Gleichlauffräsen.
4. Bei Vibrationen oder unüblichen Geräuschen reduzieren Sie die Schnittdaten (wie oben empfohlen) entsprechend.
5. Werkzeugauskragung so kurz wie möglich wählen.

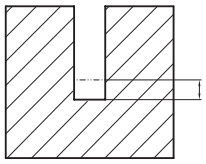
Recommended cutting data · Empfohlene Schnittdaten

GM-2EP

Workpiece material Werkstück-material		Cast iron, Carbon steel, Alloy steel Kohlenstoffstahl Leg. Stahl ~750N/mm²			Carbon steel, Alloy steel Kohlenstoffstahl Leg. Stahl ~30HRC			Pre-hardened steel, Quenched and tempered steel Vergüteter Stahl ~40HRC			Stainless steel Rostfreier Stahll		
Diameter Ø (mm)	Effective length (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Ap (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Ap (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Ap (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Ap (mm)
0.5	4	28000	200	0.023	28000	175	0.021	28000	150	0.018	25000	100	0.014
	6	22000	150	0.007	22000	125	0.006	22000	100	0.005	20000	75	0.004
	8	18000	100	0.005	18000	75	0.005	18000	75	0.004	20000	50	0.003
0.8	4	32000	400	0.057	32000	350	0.053	32000	300	0.044	25000	200	0.035
	6	26000	300	0.036	26000	250	0.034	26000	200	0.028	21000	150	0.022
	8	22000	200	0.026	22000	150	0.024	22000	125	0.020	18000	100	0.016
	10	22000	150	0.01	22000	100	0.01	22000	75	0.008	18000	75	0.006
1.0	4	29000	800	0.08	27000	600	0.08	26000	400	0.07	20000	300	0.05
	6	29000	800	0.07	27000	600	0.07	26000	400	0.06	20000	300	0.04
	8	24000	600	0.05	23000	400	0.04	22000	300	0.04	18000	200	0.03
	10	20000	500	0.03	19000	400	0.03	18000	300	0.03	15000	200	0.02
	12	20000	300	0.02	19000	200	0.02	18000	175	0.02	15000	150	0.01
	14	18000	200	0.015	15000	150	0.01	15000	125	0.01	12000	100	0.008
1.2	6	25000	800	0.09	23000	600	0.08	22000	400	0.07	17000	300	0.05
	8	21000	600	0.07	20000	400	0.07	19000	300	0.05	14000	200	0.04
	10	21000	600	0.06	20000	400	0.05	19000	300	0.04	14000	200	0.03
	12	18000	400	0.04	17000	300	0.04	16000	200	0.03	11000	150	0.02
1.5	6	20000	800	0.15	18000	600	0.14	18000	400	0.11	14000	300	0.09
	8	19000	600	0.11	16000	400	0.10	15000	300	0.08	12000	200	0.07
	10	19000	600	0.09	16000	400	0.08	15000	300	0.06	12000	200	0.05
	12	19000	600	0.07	16000	400	0.06	15000	300	0.05	12000	200	0.04
	14	19000	500	0.06	16000	350	0.05	15000	250	0.04	12000	180	0.03
2.0	6	16000	800	0.34	15000	600	0.31	14000	450	0.26	11000	350	0.21
	8	16000	800	0.29	15000	600	0.26	14000	450	0.22	11000	350	0.18
	10	14000	600	0.26	1300	400	0.24	12000	300	0.20	9000	250	0.16
	12	14000	600	0.14	13000	400	0.13	12000	300	0.11	9000	250	0.09
	14	14000	500	0.10	13000	350	0.11	12000	250	0.09	9000	200	0.07
	16	14000	400	0.08	13000	300	0.08	12000	200	0.07	9000	150	0.06
max. cutting depth max Schnitttiefe		 Ap (Once cutting depth)											

Recommended cutting data · Empfohlene Schnittdaten

GM-2EP

Workpiece material Werkstück-material		Cast iron, Carbon steel, Alloy steel Kohlenstoffstahl Leg. Stahl ~750N/mm²			Carbon steel, Alloy steel Kohlenstoffstahl Leg. Stahl ~30HRC			Pre-hardened steel, Quenched and tempered steel Vergüteter Stahl ~40HRC			Stainless steel Rostfreier Stahl		
Diameter Ø (mm)	Effective length (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Ap (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Ap (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Ap (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Ap (mm)
2.5	8	13000	800	0.42	12000	600	0.39	11000	450	0.33	9000	350	0.26
	10	13000	800	0.36	12000	600	0.33	11000	450	0.28	9000	350	0.22
	12	13000	800	0.24	12000	600	0.23	11000	450	0.19	9000	350	0.15
	14	12000	600	0.18	10000	400	0.17	9000	300	0.14	7000	250	0.11
	16	12000	600	0.13	10000	400	0.12	9000	300	0.09	7000	250	0.08
	18	12000	600	0.11	10000	350	0.10	9000	250	0.07	7000	200	0.07
	20	12000	600	0.09	10000	350	0.08	9000	250	0.05	7000	200	0.05
3.0	6	11000	800	0.42	10000	600	0.39	10000	450	0.32	8000	350	0.27
	8	11000	800	0.39	10000	600	0.36	10000	450	0.30	8000	350	0.24
	10	11000	800	0.31	10000	600	0.29	10000	450	0.24	8000	350	0.19
	12	11000	800	0.29	10000	500	0.27	10000	400	0.22	8000	300	0.16
	14	11000	600	0.27	10000	450	0.25	10000	350	0.20	8000	250	0.15
	16	10000	600	0.22	10000	400	0.20	9000	300	0.17	6000	200	0.13
	18	10000	600	0.16	10000	400	0.14	9000	300	0.12	6000	200	0.10
	20	10000	500	0.12	10000	350	0.10	9000	250	0.08	6000	175	0.07
4.0	12	8000	800	0.42	7000	600	0.38	7000	450	0.32	6000	350	0.26
	16	8000	800	0.39	7000	500	0.35	7000	400	0.30	6000	300	0.24
	20	7000	600	0.34	7000	400	0.30	6000	350	0.27	5000	250	0.20
	25	7000	600	0.30	7000	400	0.27	6000	350	0.24	5000	250	0.15
5.0	16	6000	800	0.49	6000	500	0.45	5000	400	0.38	5000	300	0.30
	25	5000	800	0.45	5000	400	0.42	5000	350	0.35	5000	250	0.25
Max. cutting depth max Schnitttiefe		 Ap (Once cutting depth)											

1.Please select high precise machine and tool holder.
2.Please use air blow or MQL (minimum oil mist cooling).
3.Make overhang as short as possible if no interference.
4.Reduce feed correspondingly when rotating speed is low.

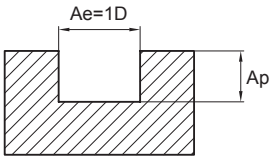
1. Bitte präzise Maschine und Werkzeugaufnahmen wählen
2. Als Kühlmittel bitte Luft oder MQL (Minimalmengen) verwenden.
3. Werkzeugauskragung so kurz wie möglich wählen.
4. Bitte Vorschub entsprechend reduzieren, wenn die Drehzahlen niedrig sind.

Recommended cutting data · Empfohlene Schnittdaten

GM-2ES

Workpiece material Werkstückstoff	Cast iron, Nodular cast iron Grauguss GGG		Carbon steel, Alloy steel Kohlenstoffstahl Leg. Stahl ~750N/mm²		Carbon steel, Alloy steel Kohlenstoffstahl Leg. Stahl ~30HRC		Pre-hardened steel, Quenched and tempered steel Vergüteter Stahl ~40HRC		Stainless steel · Rostfreier Stahl	
Diameter Ø (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)
0.3	32000	115	32000	115	32000	115	32000	80	32000	40
0.4	32000	125	32000	125	32000	125	32000	90	27500	50
0.5	32000	125	32000	125	29500	125	25000	90	22000	50
0.6	32000	125	32000	125	24500	125	21000	90	18500	50
0.7	32000	125	32000	125	24500	125	21000	90	18500	50
0.8	24500	125	24500	125	18500	125	15500	90	13500	50
0.9	24500	125	24500	125	18500	125	15500	90	13500	50
1.0	21000	140	25000	165	16800	130	14500	90	10000	50
1.5	13000	140	15000	165	11800	130	10000	90	7000	50
2.0	13000	160	15000	185	11800	145	10000	100	7000	60
2.5	8700	200	10000	240	8200	185	6600	100	4700	60
3.0	8700	235	10000	270	8200	220	6600	100	4700	75

Max. cutting depth
max Schnitttiefe



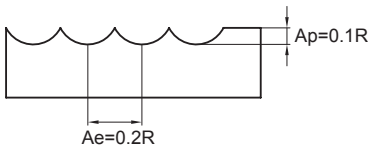
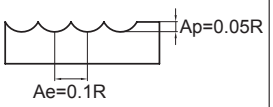
Milling slot · Nutenfräsen	
Tools Diameter	Cutting depth Ap
D<Ø1	0.05D
Ø1≤D≤Ø3	0.15D

1.Please select high precise machine and tool holder.
2.Please use air blow or cutting liquid with high mist retardant property.
3.Vibration and unusual noise may be generated if the machine rigidity and workpiece fixture stability is low, please reduce the rotating speed and feed rate like mentioned above.
4.Make overhang as short as possible if no interference.

1. Bitte präzise Maschine und Werkzeugaufnahmen wählen.
2. Als Kühlmittel bitte Luft oder MQL (Minimalmengen) verwenden..
3. Bei Vibrationen oder unüblichen Geräuschen reduzieren Sie die Schnittdaten (wie oben empfohlen) entsprechend.
4. Werkzeugauskragung so kurz wie möglich wählen.

Recommended cutting data · Empfohlene Schnittdaten

GM-2B | GM-2BL

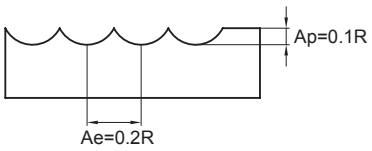
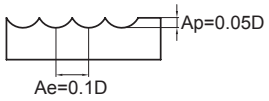
Workpiece material Werkstückstoff	Cast iron, Nodular cast iron Grauguss GGG		Carbon steel, Alloy steel Kohlenstoffstahl Leg. Stahl ~750N/mm²		Carbon steel, Alloy steel Kohlenstoffstahl Leg. Stahl ~30HRC		Pre-hardened steel, Quenched and tempered steel Vergüteter Stahl ~40HRC		Stainless steel · Rostfreier Stahl		Pre-hardened steel, Quenched and tempered steel Vergüteter Stahl ~50HRC	
Diameter Ø (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)
R0.5	40000	800	40000	800	38000	700	32000	320	22300	200	25000	275
R1.0	24000	900	24000	900	19000	760	16000	400	11150	230	13000	275
R1.5	15500	950	15500	950	12750	760	10600	450	7400	290	8500	280
R2.0	11500	950	11500	950	9550	760	8000	550	5550	370	6500	370
R2.5	9500	1050	9500	1050	7650	800	6400	550	4450	370	5000	375
R3.0	8000	1050	8000	1050	6400	800	5300	580	3700	390	4200	390
R4.0	6000	1300	6000	1300	4800	950	4000	700	2750	455	3200	440
R5.0	4800	1200	4800	1200	3800	900	3200	650	2200	430	2500	440
R6.0	4000	1100	4000	1100	3200	840	2650	610	1850	430	2100	420
R8.0	3000	1050	3000	1050	2400	800	2000	600	1350	380	1600	375
R10.0	2400	950	2400	950	1900	680	1600	560	1100	370	1250	330
Max. cutting depth max Schnitttiefe												

1.Please select high precise machine and tool holder.
2.Please use air blow or cutting liquid with high mist retardant property.
3.Vibration and unusual noise may be generated if the machine rigidity and workpiece fixture stability is low, please reduce the rotating speed and feed rate like mentioned above.
4.Make overhang as short as possible if no interference.

1. Bitte präzise Maschine und Werkzeugaufnahmen wählen.
2. Als Kühlmittel bitte Luft oder MQL (Minimalmengen) verwenden..
3. Bei Vibrationen oder unüblichen Geräuschen reduzieren Sie die Schnittdaten (wie oben empfohlen) entsprechend.
4. Werkzeugauskragung so kurz wie möglich wählen.

Recommended cutting data · Empfohlene Schnittdaten

GM-4B

Workpiece material Werkstückstoff	Cast iron, Nodular cast iron Grauguss GGG		Carbon steel, Alloy steel Kohlenstoffstahl Leg. Stahl ~750N/mm²		Carbon steel, Alloy steel Kohlenstoffstahl Leg. Stahl ~30HRC		Pre-hardened steel, Quenched and tempered steel Vergüteter Stahl ~40HRC		Stainless steel · Rostfreier Stahl		Pre-hardened steel, Quenched and tempered steel Vergüteter Stahl ~50HRC	
Cutting speed Schnittgeschw.	150 m/min		150m/min		120m/min		100m/min		70m/min		80m/min	
Diameter Ø (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)
R1.5	15500	1710	15500	1710	12750	1340	10600	810	7400	520	8500	500
R2.0	11500	1710	11500	1710	9550	1340	8000	990	5550	660	6500	665
R2.5	9500	1890	9500	1890	7650	1440	6400	990	4450	660	5000	675
R3.0	8000	1890	8000	1890	6400	1440	5300	1040	3700	700	4200	700
R4.0	6000	2340	6000	2340	4800	1710	4000	1260	2750	820	3200	790
R5.0	4800	2160	4800	2160	3800	1620	3200	1170	2200	770	2500	790
R6.0	4000	1980	4000	1980	3200	1510	2650	1100	1850	770	2100	755
R8.0	3000	1890	3000	1890	2400	1440	2000	1080	1350	680	1600	675
R10.0	2400	1710	2400	1710	1900	1220	1600	1000	1100	660	1250	595
Max. cutting depth max Schnitttiefe												

1.Please select high precise machine and tool holder.
2.Please use air blow or cutting liquid with high mist retardant property.
3.Vibration and unusual noise may be generated if the machine rigidity and workpiece fixture stability is low, please reduce the rotating speed and feed rate like mentioned above.
4.Make overhang as short as possible if no interference.

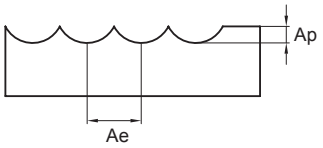
1. Bitte präzise Maschine und Werkzeugaufnahmen wählen.
2. Als Kühlmittel bitte Luft oder MQL (Minimalmengen) verwenden..
3. Bei Vibrationen oder unüblichen Geräuschen reduzieren Sie die Schnittdaten (wie oben empfohlen) entsprechend.
4. Werkzeugauskragung so kurz wie möglich wählen.

Recommended cutting data · Empfohlene Schnittdaten

GM-2BS

Workpiece material Werkstückstoff	Cast iron, Nodular cast iron Grauguss GGG		Carbon steel, Alloy steel Kohlenstoffstahl Leg. Stahl ~750N/mm²		Carbon steel, Alloy steel Kohlenstoffstahl Leg. Stahl ~30HRC		Pre-hardened steel, Quenched and tempered steel Vergüteter Stahl ~40HRC		Stainless steel · Rostfreier Stahl	
Diameter Ø (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)
R0.15	32000	300	32000	300	32000	270	32000	250	32000	150
R0.2	32000	380	32000	380	32000	320	32000	300	32000	175
R0.25	32000	460	32000	460	32000	410	32000	330	32000	205
R0.3	32000	535	32000	535	32000	500	32000	420	32000	265
R0.35	32000	550	32000	550	32000	520	32000	440	32000	270
R0.4	32000	610	32000	610	32000	560	32000	460	27500	285
R0.45	32000	700	32000	700	32000	600	25000	400	27500	285
R0.5	32000	765	32000	765	32000	640	25000	400	22000	285
R1.0	24000	900	24000	900	19000	760	16000	400	11150	230
R1.5	15500	950	15500	950	12750	760	10600	450	7400	290

Max. cutting depth
max Schnitttiefe



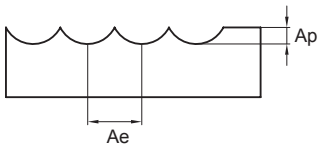
Milling slot · Nutenfräsen		
Ø	Ap	Ae
D<Ø1	0.05R	0.2R
Ø1≤D≤Ø3	0.1R	0.2R

1. Please select high precise machine and tool holder.
2. Please use air blow or cutting liquid with high mist retardant property.
3. Make overhang as short as possible if no interference.
4. Reduce feed correspondingly when rotating speed is low.

1. Bitte präzise Maschine und Werkzeugaufnahmen wählen
2. Als Kühlmittel bitte Luft oder MQL (Minimalmengen) verwenden.
3. Werkzeugauskragung so kurz wie möglich wählen.
4. Bitte Vorschub entsprechend reduzieren, wenn die Drehzahlen niedrig sind.

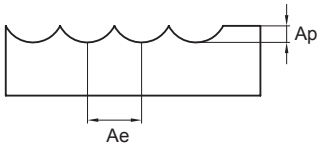
Recommended cutting data · Empfohlene Schnittdaten

GM-2BP

Workpiece material Werkstück-material		Cast iron, Carbon steel, Alloy steel Kohlenstoffstahl Leg. Stahl ~750N/mm²				Carbon steel, Alloy steel Kohlenstoffstahl Leg. Stahl ~30HRC				Pre-hardened steel, Quenched and tempered steel Vergüteter Stahl ~40HRC				Stainless steel · Rostfreier Stahl			
Diameter Ø (mm)	Effective length (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Ap (mm)	Ae (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Ap (mm)	Ae (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Ap (mm)	Ae (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Ap (mm)	Ae (mm)
R0.25	4	27000	400	0.02	0.025	27000	380	0.02	0.025	27000	300	0.02	0.025	27000	200	0.02	0.025
	6	21000	200	0.01	0.015	21000	180	0.01	0.015	21000	160	0.01	0.015	21000	150	0.01	0.015
R0.3	4	27000	400	0.03	0.12	27000	380	0.03	0.12	25000	250	0.03	012	24000	200	0.03	0.12
	6	25000	300	0.03	0.12	25000	280	0.03	0.12	20000	150	0.03	0.12	20000	140	0.03	0.12
	8	25000	240	0.03	0.12	25000	225	0.03	0.12	20000	120	0.03	0.12	20000	110	0.03	0.12
R0.4	4	27000	600	0.04	0.16	27000	550	0.04	0.16	23000	450	0.04	0.16	21000	300	0.04	0.16
	6	24000	400	0.04	0.12	24000	360	0.04	0.12	21000	250	0.04	0.12	19000	200	0.04	0.12
	8	22000	300	0.04	0.12	22000	270	0.04	0.12	19000	150	0.04	0.12	19000	140	0.04	0.12
	10	22000	270	0.03	0.09	22000	250	0.03	0.09	19000	135	0.03	0.09	19000	120	0.03	0.09
R0.5	4	28000	600	0.05	0.20	28000	550	0.05	0.20	25000	500	0.05	0.20	21000	300	0.05	0.20
	6	21000	400	0.05	0.20	21000	360	0.05	0.20	19000	300	0.05	0.20	16000	200	0.05	0.2
	8	21000	360	0.05	0.15	21000	320	0.05	0.15	19000	270	0.05	0.15	16000	180	0.05	0.15
	10	18000	300	0.03	0.10	18000	270	0.03	0.10	17000	200	0.03	0.10	14000	150	0.03	0.10
	12	18000	270	0.03	0.10	18000	250	0.03	0.10	17000	180	0.03	0.10	14000	135	0.03	0.10
R0.6	6	20000	600	0.06	0.24	20000	540	0.06	0.24	17000	300	0.06	0.24	14000	200	0.06	0.24
	8	20000	540	0.06	0.24	20000	500	0.06	0.24	17000	270	0.06	0.24	14000	170	0.06	0.24
	12	16000	300	0.06	0.18	16000	270	0.06	0.18	14000	200	0.06	0.18	11000	150	0.06	0.18
	16	16000	270	0.03	0.12	16000	230	0.03	0.12	14000	175	0.03	0.12	11000	135	0.03	0.12
R0.75	8	17000	600	0.08	0.30	17000	540	0.08	0.30	15000	300	0.08	0.30	12000	250	0.08	0.30
	12	17000	540	0.06	0.24	17000	500	0.06	0.24	15000	275	0.06	0.24	12000	225	0.06	0.24
	16	13000	300	0.04	0.16	13000	275	0.04	0.16	12000	200	0.04	0.16	9500	150	0.04	0.16
R1.0	6	16500	800	0.10	0.40	16500	750	0.10	0.40	16500	560	0.10	0.40	13500	450	0.10	0.40
	8	16500	800	0.10	0.32	16500	750	0.10	0.32	16500	560	0.10	0.32	13500	450	0.10	0.32
	10	14000	630	0.08	0.30	14000	600	0.08	0.30	13000	450	0.08	0.30	10000	270	0.08	0.30
	12	14000	630	0.06	0.30	14000	600	0.06	0.30	13000	450	0.06	0.30	10000	270	0.06	0.30
	16	14000	550	0.06	0.24	14000	530	0.06	0.24	13000	400	0.06	0.24	10000	270	0.06	0.24
	20	11000	360	0.06	0.16	11000	330	0.06	0.16	10000	225	0.06	0.16	8000	175	0.06	0.16
Max. cutting depth max Schnitttiefe																	

Recommended cutting data · Empfohlene Schnittdaten

GM-2BP

Workpiece material Werkstück-material		Cast iron, Carbon steel, Alloy steel Kohlenstoffstahl Leg. Stahl ~750N/mm²				Carbon steel, Alloy steel Kohlenstoffstahl Leg. Stahl ~30HRC				Pre-hardened steel, Quenched and tempered steel Vergüteter Stahl ~40HRC				Stainless steel · Rostfreier Stahl			
Diameter Ø (mm)	Effective length (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Ap (mm)	Ae (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Ap (mm)	Ae (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Ap (mm)	Ae (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Ap (mm)	Ae (mm)
R1.25	**8**	14000	800	0.10	0.32	14000	750	0.10	0.32	14000	560	0.10	0.32	12500	450	0.10	0.32
	12	13000	630	0.06	0.30	13000	600	0.06	0.30	12000	450	0.06	0.30	10000	270	0.06	0.30
	16	13000	550	0.06	0.24	13000	530	0.06	0.24	12000	400	0.06	0.24	10000	270	0.06	0.24
	20	10000	360	0.06	0.16	10000	330	0.06	0.16	8000	225	0.06	0.16	7000	175	0.06	0.16
R1.5	8	12000	800	0.20	0.40	12000	720	0.20	0.40	9500	600	0.20	0.40	7500	400	0.20	0.40
	10	12000	800	0.15	0.40	12000	720	0.15	0.40	9500	600	0.15	0.40	7500	400	0.15	0.40
	12	12000	720	0.15	0.40	12000	650	0.15	0.40	9500	540	0.15	0.40	7500	360	0.15	0.40
	16	10000	600	0.15	0.40	10000	540	0.15	0.40	8500	300	0.15	0.40	6500	250	0.15	0.40
	20	10000	600	0.10	0.32	10000	540	0.10	0.32	8500	300	0.10	0.32	6500	250	0.10	0.32
R2.0	10	9000	800	0.20	0.80	9000	720	0.20	0.80	7500	600	0.20	0.80	6000	400	0.20	0.80
	16	9000	800	0.20	0.60	9000	720	0.20	0.60	7500	600	0.20	0.60	6000	400	0.20	0.60
	20	7000	600	0.20	0.40	7000	540	0.20	0.40	6000	400	0.20	0.40	5000	250	0.20	0.40
	25	7000	600	0.15	0.40	7000	540	0.15	0.40	6000	400	0.15	0.40	5000	250	0.15	0.40
R2.5	16	7000	600	0.25	1.00	7000	540	0.25	0.10	6500	500	0.25	1.0	5000	400	0.25	1.00
	25	6000	500	0.25	1.00	6000	450	0.25	1.00	5000	500	0.25	1.00	4000	250	0.25	1.00
Max. cutting depth max Schnitttiefe																	

1. Please select high precise machine and tool holder.
2. Please use air blow or cutting liquid with high mist retardant property.
3. Make overhang as short as possible if no interference.
4. Reduce feed correspondingly when rotating speed is low.

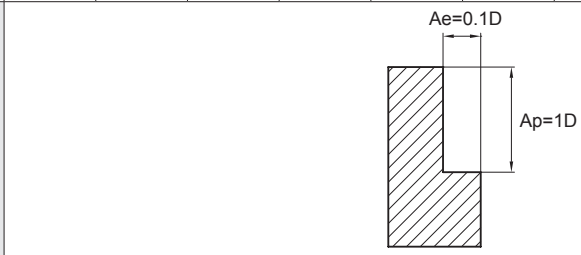
1. Bitte präzise Maschine und Werkzeugaufnahmen wählen
2. Als Kühlmittel bitte Luft oder MQL (Minimalmengen) verwenden.
3. Werkzeugauskragung so kurz wie möglich halten.
4. Bitte Vorschub entsprechend reduzieren, wenn die Drehzahlen niedrig sind.

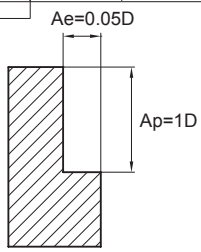
Recommended cutting data · Empfohlene Schnittdaten

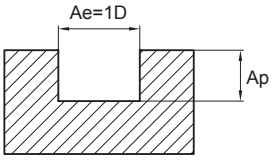
GM-2R

Workpiece material Werkstück-material	Cast iron, Nodular cast iron Grauguss GGG		Carbon steel, Alloy steel Kohlenstoffstahl Leg. Stahl ~750N/mm²		Carbon steel, Alloy steel Kohlenstoffstahl Leg. Stahl ~30HRC		Pre-hardened steel, Quenched and tempered steel Vergüteter Stahl ~40HRC		Stainless steel · Rostfreier Stahl		Pre-hardened steel, Quenched and tempered steel Vergüteter Stahl ~50HRC	
Diameter Ø (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)
1	20000	200	20000	200	20000	160	20000	160	20000	60	20000	120
2	15000	320	15000	320	15000	290	15000	280	11150	84	13000	180
3	14000	545	14000	545	13000	510	10600	420	7500	120	8500	330
4	10800	560	10800	560	10000	520	8000	430	5500	130	6500	335
5	8200	580	8200	580	7600	540	6400	450	4500	130	5000	355
6	7000	600	7000	600	6400	550	5300	460	3700	140	4200	360
8	5200	600	5200	600	4800	550	4000	460	2800	140	3200	365
10	4200	580	4200	580	3800	540	3200	445	2200	140	2500	350
12	3500	580	3500	580	3200	540	2650	445	1850	140	2100	350

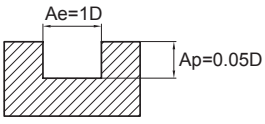
Max. cutting depth
max Schnitttiefe







Milling slot · Nutenfräsen	
Ø	Ap
Ø1≤D<Ø3	0.15D
Ø3≤D	0.3D



1. The above table shows the standard value of side milling. When slot milling, of rotating speed 50%~70% and feed rate like mentioned above 40%~60%.
2. Please select high precise machine and tool holder.
3. Please use air blow or cutting liquid with high mist retardant property.
4. Down milling is recommended in side milling.
5. Vibration and unusual noise may be generated if the machine rigidity and workpiece fixture stability is low, please reduce the rotating speed and feed rate like mentioned above.
6. Make overhang as short as possible if no interference.

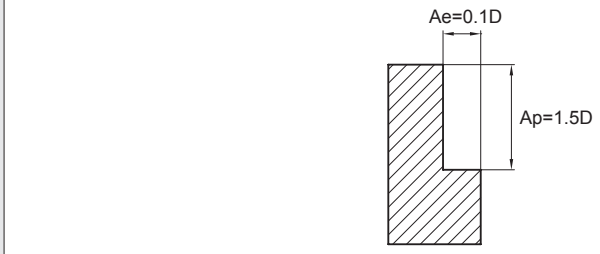
1. Die obige Tabelle zeigt Standard Werte für das Eckfräsen. Bei Nutenfräsen, Schnittgeschwindigkeit auf 50-70% und den Vorschub auf 40-60% reduzieren.
2. Bitte präzise Maschinen und Werkzeughalter verwenden.
3. Bitte Luftkühlung oder Schneidflüssigkeit benutzen.
4. Empfohlene Fräsmethode: Gleichlauffräsen.
5. Bei Vibrationen oder unüblichen Geräuschen reduzieren Sie die Schnittdaten (wie oben empfohlen) entsprechend.
6. Werkzeugauskragung so kurz wie möglich wählen.

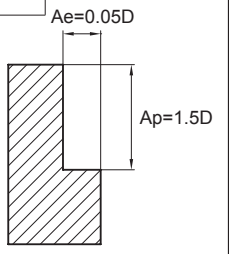
Recommended cutting data · Empfohlene Schnittdaten

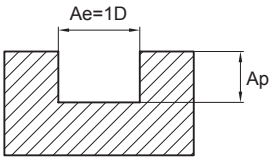
GM-4R | GM-4RL

Workpiece material Werkstück-material	Cast iron, Nodular cast iron Grauguss GGG		Carbon steel, Alloy steel Kohlenstoffstahl Leg. Stahl ~750N/mm²		Carbon steel, Alloy steel Kohlenstoffstahl Leg. Stahl ~30HRC		Pre-hardened steel, Quenched and tempered steel Vergüteter Stahl ~40HRC		Stainless steel · Rostfreier Stahl		Pre-hardened steel, Quenched and tempered steel Vergüteter Stahl ~50HRC	
Diameter Ø (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)
3	14000	820	14000	820	13000	755	10600	630	7500	145	8500	490
4	10800	840	10800	840	10000	770	8000	640	5500	145	6500	500
5	8200	880	8200	880	7600	810	6400	670	4500	145	5000	530
6	7000	900	7000	900	6400	830	5300	690	3700	160	4200	540
8	5200	890	5200	890	4800	815	4000	680	2800	160	3200	550
10	4200	880	4200	880	3800	810	3200	670	2200	160	2500	520
12	3500	880	3500	880	3200	810	2650	670	1850	160	2100	520
16	2600	680	2600	680	2400	630	2000	525	1400	120	1600	490

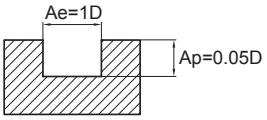
Max. cutting depth
max Schnitttiefe







Milling slot · Nutenfräsen	
Ø	Ap
Ø1≤D<Ø3	0.15D
Ø3≤D	0.3D

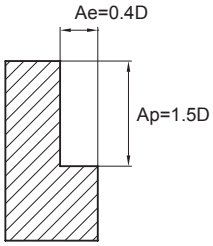
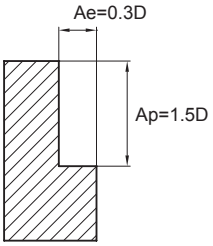


1. The above table shows the standard value of side milling. When slot milling, of rotating speed 50%~70% and feed rate like mentioned above 40%~60%.
2. Please select high precise machine and tool holder.
3. Please use air blow or cutting liquid with high mist retardant property.
4. Down milling is recommended in side milling.
5. Vibration and unusual noise may be generated if the machine rigidity and workpiece fixture stability is low, please reduce the rotating speed and feed rate like mentioned above.
6. Make overhang as short as possible if no interference.

1. Die obige Tabelle zeigt Standard Werte für das Eckfräsen. Bei Nutenfräsen, Schnittgeschwindigkeit auf 50-70% und den Vorschub auf 40-60% reduzieren.
2. Bitte präzise Maschinen und Werkzeughalter verwenden.
3. Bitte Luftkühlung oder Schneidflüssigkeit benutzen.
4. Empfohlene Fräsmethode: Gleichlauffräsen.
5. Bei Vibrationen oder unüblichen Geräuschen reduzieren Sie die Schnittdaten (wie oben empfohlen) entsprechend.
6. Werkzeugauskragung so kurz wie möglich wählen.

Recommended cutting data · Empfohlene Schnittdaten

GM-4W_side milling

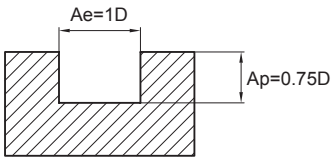
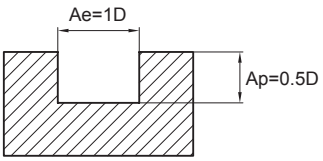
Workpiece material Werkstück-material	Cast iron, Nodular cast iron Grauguss GGG		Carbon steel, Alloy steel Kohlenstoffstahl Leg. Stahl ~750N/mm²		Carbon steel, Alloy steel Kohlenstoffstahl Leg. Stahl ~30HRC		Pre-hardened steel, Quenched and tempered steel Vergüteter Stahl ~40HRC		Stainless steel · Rostfreier Stahl	
Diameter Ø (mm)	Rotating Drehzahl (min^{-1})	Feed(mm/min)	Rotating Drehzahl (min^{-1})	Feed(mm/min)	Rotating Drehzahl (min^{-1})	Feed(mm/min)	Rotating Drehzahl (min^{-1})	Feed(mm/min)	Rotating Drehzahl (min^{-1})	Feed(mm/min)
6	6350	760	5300	640	4500	360	3450	280	2650	210
7	5460	760	4550	640	3650	360	3000	280	2250	310
8	4750	760	4000	640	3400	410	2650	310	2000	240
9	4250	760	3540	640	2850	410	2300	310	1750	240
10	3800	760	3200	640	2700	430	2050	330	1600	260
11	3470	760	2900	640	2400	430	1850	330	1450	260
12	3200	770	2250	650	1950	470	1500	360	1150	280
16	2400	770	2000	640	1700	480	1300	360	1000	280
20	1900	760	1600	610	1350	470	1050	350	800	260
Max. cutting depth max Schnitttiefe										

1.Please select high precise machine and tool holder.
2.Please use air blow or cutting liquid with high mist retardant property.
3.Down milling is recommended in side milling.
4.Vibration and unusual noise may be generated if the machine rigidity and workpiece fixture stability is low, please reduce the rotating speed and feed rate like mentioned above.
5.Make overhang as short as possible if no interference.

1. Bitte präzise Maschinen und Werkzeughalter verwenden.
2. Bitte Luftkühlung oder Schneidflüssigkeit benutzen.
3. Empfohlene Fräsmethode: Gleichlauffräsen.
4. Bei Vibrationen oder unüblichen Geräuschen reduzieren Sie die Schnittdaten (wie oben empfohlen) entsprechend.
5. Werkzeugauskragung so kurz wie möglich wählen.

Recommended cutting data · Empfohlene Schnittdaten

GM-4W_slot milling

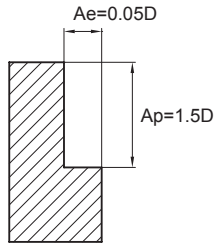
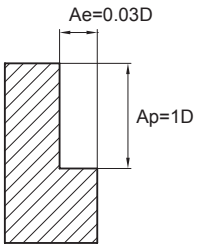
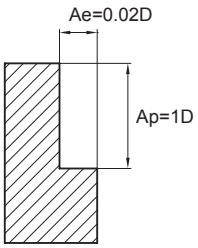
Workpiece material Werkstück-material	Cast iron, Nodular cast iron Grauguss GGG		Carbon steel, Alloy steel Kohlenstoffstahl Leg. Stahl ~750N/mm²		Carbon steel, Alloy steel Kohlenstoffstahl Leg. Stahl ~30HRC		Pre-hardened steel, Quenched and tempered steel Vergüteter Stahl ~40HRC		Stainless steel · Rostfreier Stahl	
Cutting speed Schnittgeschw.	80~120 m/min		70~100m/min		60~90m/min		40~70m/min		30~60m/min	
Diameter Ø (mm)	Rotating Drehzahl (min^{-1})	Feed(mm/min)	Rotating Drehzahl (min^{-1})	Feed(mm/min)	Rotating Drehzahl (min^{-1})	Feed(mm/min)	Rotating Drehzahl (min^{-1})	Feed(mm/min)	Rotating Drehzahl (min^{-1})	Feed(mm/min)
6	5300	640	4500	540	3700	300	2900	230	2400	190
7	4500	630	3800	540	3200	300	2500	230	2050	190
8	4000	640	3400	540	2800	340	2200	260	1800	220
9	3500	630	3000	540	2450	340	1950	260	1600	220
10	3200	640	2700	540	2250	360	1750	280	1450	230
11	3000	630	2450	540	2050	360	1600	280	1300	230
12	2650	640	2250	540	1850	370	1450	290	1200	240
16	2000	640	1700	540	1400	390	1100	310	900	250
20	1600	640	1350	510	1100	390	900	300	700	230
Max. cutting depth max Schnitttiefe	 Maximum Ap=12mm									

1.Please select high precise machine and tool holder.
2.Please use air blow or cutting liquid with high mist retardant property.
3.Vibration and unusual noise may be generated if the machine rigidity and workpiece fixture stability is low, please reduce the rotating speed and feed rate like mentioned above.
4.Make overhang as short as possible if no interference.

1. Bitte präzise Maschine und Werkzeugaufnahmen wählen.
2. Bitte Luftkühlung oder Schneidflüssigkeit benutzen.
3. Bei Vibrationen oder unüblichen Geräuschen reduzieren Sie die Schnittdaten (wie oben empfohlen) entsprechend4. Werkzeugauskragung so kurz wie möglich wählen.

Recommended cutting data · Empfohlene Schnittdaten

HM-2E

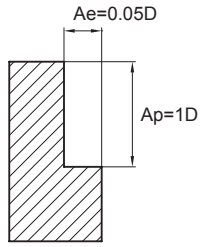
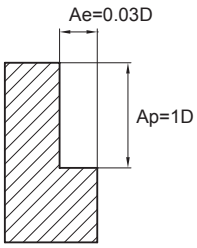
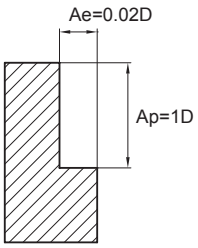
Workpiece material Werkstück-material	Pre-hardened steel, Hardened steel Vergüteter Stahl, gehärteter Stahl 40~50HRC		Hardened steel gehärteter Stahl 50~60HRC		Hardened steel gehärteter Stahl 60~68HRC	
Diameter Ø (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)
1	40000	160	40000	160	32000	130
2	40000	400	24000	240	16000	160
3	32000	510	16000	255	11000	175
4	24000	625	12000	310	8000	210
5	19000	685	9500	340	6400	230
6	16000	770	8000	385	5300	255
8	12000	770	6000	385	4000	255
10	9600	770	4800	385	3200	255
12	8000	800	4000	400	2700	270
14	6800	680	3400	340	2300	230
16	6000	600	3000	300	2000	200
18	5300	530	2700	270	1800	180
20	4800	480	2400	240	1600	160
Max. cutting depth max Schnitttiefe	 Maximum Ae=1.0mm		 Maximum Ae=0.5mm		 Maximum Ae=0.3mm	

1.Please select machine and holder with high precision and rigidity.
2.Vibration and unusual noise may be generated if the machine rigidity and workpiece fixture stability is low, please reduce the rotating speed and feed rate like mentioned above.
3.Please use air blow or MQL(minimum oil mist cooling).
4.Down milling is recommended in side milling.
5.Make overhang as short as possible if no interference.

1. Bitte präzise Maschinen und Werkzeughalter verwenden.
2. Bei Vibrationen oder unüblichen Geräuschen reduzieren Sie die Schnittdaten (wie oben empfohlen) entsprechend.
3. Bitte Luftkühlung oder MQL (Minimalmengen) benutzen.
4. Empfohlene Fräsmethode: Gleichlauffräsen.
5. Werkzeugauskragung so kurz wie möglich wählen.

Recommended cutting data · Empfohlene Schnittdaten

HM-2EFP

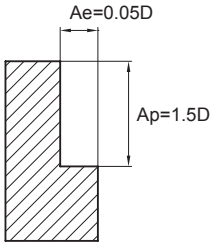
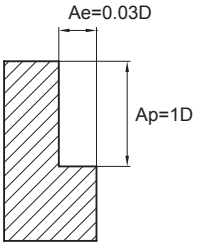
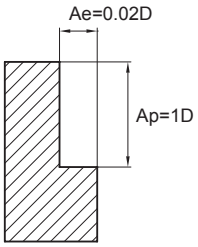
Workpiece material Werkstück-material	Pre-hardened steel, Hardened steel Vergüteter Stahl, gehärteter Stahl 40~50HRC		Hardened steel gehärteter Stahl 50~60HRC		Hardened steel gehärteter Stahl 60~68HRC	
Diameter Ø (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)
6	16000	1155	8000	460	5300	305
8	12000	1155	6000	460	4000	305
10	9600	1155	4800	460	3200	305
12	8000	1200	4000	480	2700	325
16	6000	900	3000	360	2000	240
20	4800	720	2400	285	1600	195
Max. cutting depth max Schnitttiefe	 Maximum Ae=1.0mm		 Maximum Ae=0.5mm		 Maximum Ae=0.3mm	

1.Please select machine and holder with high precision and rigidity.
2.Vibration and unusual noise may be generated if the machine rigidity and workpiece fixture stability is low, please reduce the rotating speed and feed rate like mentioned above.
3.Please use air blow or MQL(minimum oil mist cooling).
4.Down milling is recommended in side milling.
5.Make overhang as short as possible if no interference.

1. Bitte präzise Maschinen und Werkzeughalter verwenden.
2. Bei Vibrationen oder unüblichen Geräuschen reduzieren Sie die Schnittdaten (wie oben empfohlen) entsprechend.
3. Bitte Luftkühlung oder MQL (Minimalmengen) benutzen.
4. Empfohlene Fräsmethode: Gleichlauffräsen.
5. Werkzeugauskragung so kurz wie möglich wählen.

Recommended cutting data · Empfohlene Schnittdaten

HM-4E | HM-4EL

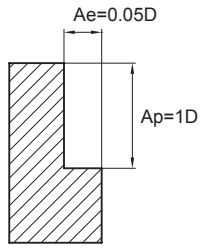
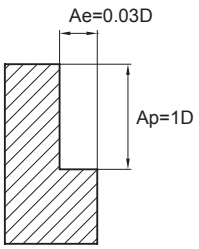
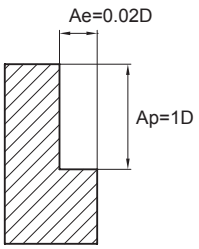
Workpiece material Werkstückstoff	Pre-hardened steel, Hardened steel Vergüteter Stahl, gehärteter Stahl 40~50HRC		Hardened steel gehärteter Stahl 50~60HRC		Hardened steel gehärteter Stahl 60~68HRC	
Diameter Ø (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)
1	40000	320	40000	320	32000	260
2	40000	800	24000	480	16000	320
3	32000	1020	16000	510	11000	350
4	24000	1250	12000	620	8000	420
5	19000	1360	9500	680	6400	460
6	16000	1540	8000	770	5300	510
8	12000	1540	6000	770	4000	510
10	9600	1540	4800	770	3200	510
12	8000	1600	4000	800	2700	540
14	6800	1340	3400	680	2300	460
16	6000	1200	3000	600	2000	400
18	5300	1060	2700	530	1800	360
20	4800	960	2400	480	1600	320
Max. cutting depth max Schnitttiefe	 Maximum Ae=1.0mm		 Maximum Ae=0.5mm		 Maximum Ae=0.3mm	

1.Please select machine and holder with high precision and rigidity.
2.Vibration and unusual noise may be generated if the machine rigidity and workpiece fixture stability is low, please reduce the rotating speed and feed rate like mentioned above.
3.Please use air blow or MQL(minimum oil mist cooling).
4.Down milling is recommended in side milling.
5.Make overhang as short as possible if no interference.

1. Bitte präzise Maschinen und Werkzeughalter verwenden.
2. Bei Vibrationen oder unüblichen Geräuschen reduzieren Sie die Schnittdaten (wie oben empfohlen) entsprechend.
3. Bitte Luftkühlung oder MQL (Minimalmengen) benutzen.
4. Empfohlene Fräsmethode: Gleichlauffräsen.
5. Werkzeugauskragung so kurz wie möglich wählen.

Recommended cutting data · Empfohlene Schnittdaten

HM-4EFP

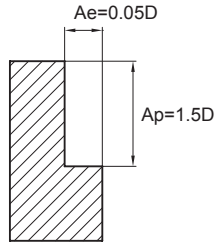
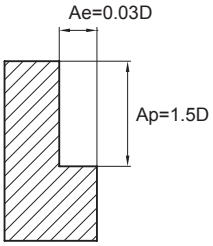
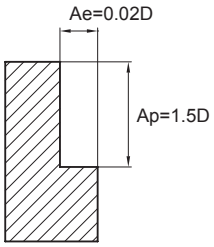
Workpiece material Werkstück-material	Pre-hardened steel, Hardened steel Vergüteter Stahl, gehärteter Stahl 40~50HRC		Hardened steel gehärteter Stahl 50~60HRC		Hardened steel gehärteter Stahl 60~68HRC	
Diameter Ø (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)
6	16000	1730	8000	920	5300	610
8	12000	1730	6000	920	4000	610
10	9600	1730	4800	920	3200	610
12	8000	1800	4000	960	2700	650
16	6000	1350	3000	720	2000	480
20	4800	1080	2400	570	1600	390
Max. cutting depth max Schnitttiefe	 Maximum Ae=1.0mm		 Maximum Ae=0.5mm		 Maximum Ae=0.3mm	

1.Please select machine and holder with high precision and rigidity.
2.Vibration and unusual noise may be generated if the machine rigidity and workpiece fixture stability is low, please reduce the rotating speed and feed rate like mentioned above.
3.Please use air blow or MQL(minimum oil mist cooling).
4.Down milling is recommended in side milling.
5.Make overhang as short as possible if no interference.

1. Bitte präzise Maschinen und Werkzeughalter verwenden.
2. Bei Vibrationen oder unüblichen Geräuschen reduzieren Sie die Schnittdaten (wie oben empfohlen) entsprechend.
3. Bitte Luftkühlung oder MQL (Minimalmengen) benutzen.
4. Empfohlene Fräsmethode: Gleichlauffräsen.
5. Werkzeugauskragung so kurz wie möglich wählen.

Recommended cutting data · Empfohlene Schnittdaten

HM-6E

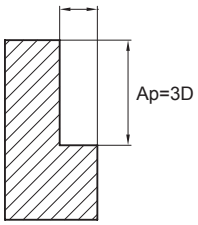
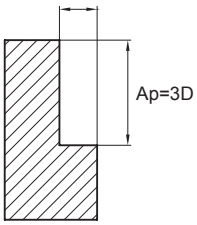
Workpiece material Werkstückstoff	Pre-hardened steel, Hardened steel Vergüteter Stahl, gehärteter Stahl 40~50HRC		Hardened steel gehärteter Stahl 50~60HRC		Hardened steel gehärteter Stahl 60~68HRC	
Cutting speed Schnittgeschw.	300m/min		150m/min		100m/min	
Diameter Ø (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)
6	16000	1850	8000	925	5300	610
8	12000	1850	6000	925	4000	610
10	9600	1850	4800	925	3200	610
12	8000	1920	4000	960	2700	650
14	6800	1600	3400	815	2300	550
16	6000	1440	3000	720	2000	480
18	5300	1270	2700	635	1800	430
20	4800	1150	2400	575	1600	385
Max. cutting depth max Schnitttiefe	 Maximum Ae=1.0mm		 Maximum Ae=0.5mm		 Maximum Ae=0.3mm	

1.Please select machine and holder with high precision and rigidity.
2.Vibration and unusual noise may be generated if the machine rigidity and workpiece fixture stability is low, please reduce the rotating speed and feed rate like mentioned above.
3.Please use air blow or MQL(minimum oil mist cooling).
4.Down milling is recommended in side milling.
5.Make overhang as short as possible if no interference.

1. Bitte präzise Maschinen und Werkzeughalter verwenden.
2. Bei Vibrationen oder unüblichen Geräuschen reduzieren Sie die Schnittdaten (wie oben empfohlen) entsprechend.
3. Bitte Luftkühlung oder MQL (Minimalmengen) benutzen.
4. Empfohlene Fräsmethode: Gleichlauffräsen.
5. Werkzeugauskragung so kurz wie möglich wählen.

Recommended cutting data · Empfohlene Schnittdaten

HM-6EL

Workpiece material Werkstückstoff	Pre-hardened steel, Hardened steel Vergüteter Stahl, gehärteter Stahl 40~50HRC		Hardened steel gehärteter Stahl 50~60HRC		Hardened steel gehärteter Stahl 60~68HRC	
Cutting speed Schnittgeschw.	300m/min		150m/min		100m/min	
Diameter Ø (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)
6	16000	1300	8000	650	5300	430
8	12000	1300	6000	650	4000	430
10	9600	1300	4800	650	3200	430
12	8000	1350	4000	670	2700	460
14	6800	1150	3400	570	2300	380
16	6000	1000	3000	500	2000	340
18	5300	890	2700	450	1800	300
20	4800	800	2400	400	1600	270
Max. cutting depth max Schnitttiefe	Ae=0.02D  Maximum Ae=0.3mm		Ae=0.01D 			

1.Please select machine and holder with high precision and rigidity.
2.Vibration and unusual noise may be generated if the machine rigidity and workpiece fixture stability is low, please reduce the rotating speed and feed rate like mentioned above.
3.Please use air blow or MQL(minimum oil mist cooling).
4.Down milling is recommended in side milling.
5.Make overhang as short as possible if no interference.

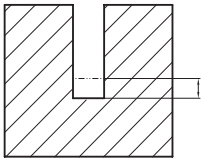
1. Bitte präzise Maschinen und Werkzeughalter verwenden.
2. Bei Vibrationen oder unüblichen Geräuschen reduzieren Sie die Schnittdaten (wie oben empfohlen) entsprechend.
3. Bitte Luftkühlung oder MQL (Minimalmengen) benutzen.
4. Empfohlene Fräsmethode: Gleichlauffräsen.
5. Werkzeugauskragung so kurz wie möglich wählen.

Recommended cutting data · Empfohlene Schnittdaten

HM-2EP

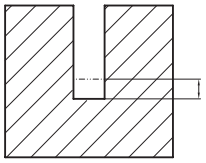
Workpiece material Werkstückstoff		Pre-hardened steel, Hardened steel Vergüteter Stahl, gehärteter Stahl 40~50HRC			Hardened steel gehärteter Stahl 50~60HRC		
Diameter Ø (mm)	Effective length (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Ap (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Ap (mm)
0.5	**4**	21000	100	0.009	17000	50	0.009
	6	20000	75	0.006	1500	35	0.007
	8	20000	50	0.002	1500	20	0.003
0.8	**4**	20000	200	0.022	14000	100	0.011
	6	18000	150	0.014	14000	75	0.009
	8	18000	100	0.01	14000	50	0.006
	10	18000	75	0.007	14000	30	0.004
1.0	**4**	17000	400	0.035	12000	100	0.016
	6	17000	400	0.03	12000	100	0.014
	8	15000	300	0.02	10000	75	0.01
	10	15000	250	0.015	10000	50	0.008
	12	12000	150	0.01	10000	50	0.006
	14	12000	100	0.007	10000	30	0.004
1.2	**6**	14000	400	0.03	10000	100	0.017
	8	12000	300	0.03	10000	100	0.014
	10	12000	300	0.02	10000	75	0.01
	12	10000	200	0.01	10000	50	0.00
1.5	**6**	12000	400	0.06	8000	200	0.028
	8	10000	300	0.04	7000	150	0.021
	10	10000	300	0.03	7000	150	0.017
	12	10000	300	0.025	7000	100	0.01
	14	10000	250	0.02	7000	75	0.005
2.0	**6**	9000	400	0.13	6000	300	0.07
	8	9000	400	0.11	6000	300	0.06
	10	7000	300	0.10	6000	200	0.05
	12	7000	300	0.06	6000	200	0.03
	14	7000	250	0.04	6000	150	0.015
	16	7000	200	0.02	6000	100	0.008

Max. cutting depth
max Schnitttiefe



Recommended cutting data · Empfohlene Schnittdaten

HM-2EP

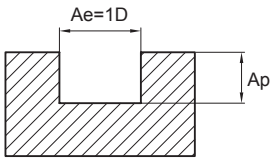
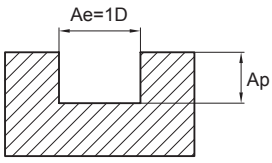
Workpiece material Werkstückstoff		Pre-hardened steel, Hardened steel Vergüteter Stahl, gehärteter Stahl 40~50HRC			Hardened steel gehärteter Stahl 50~60HRC		
Diameter Ø (mm)	Effective length (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Ap (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Ap (mm)
2.5	8	8000	400	0.16	5000	300	0.08
	10	8000	400	0.14	5000	300	0.07
	12	8000	400	0.09	5000	300	0.05
	14	6000	300	0.07	5000	200	0.03
	16	6000	300	0.05	5000	200	0.025
	18	6000	300	0.04	5000	150	0.02
	20	6000	300	0.02	5000	100	0.01
3.0	6	7000	400	0.18	5000	300	0.10
	8	7000	400	0.15	5000	300	0.08
	10	7000	400	0.12	5000	300	0.06
	12	7000	400	0.10	5000	300	0.05
	14	6000	300	0.08	5000	200	0.04
	16	6000	300	0.06	5000	200	0.03
	18	6000	300	0.05	5000	200	0.025
	20	6000	250	0.04	5000	150	0.01
4.0	12	4500	400	0.16	4000	300	0.08
	16	4500	400	0.14	4000	300	0.06
	20	4500	300	0.10	4000	300	0.04
	25	4500	300	0.08	4000	300	0.03
5.0	16	4000	400	0.19	3000	300	0.09
	25	4000	400	0.15	3000	300	0.06
Max. cutting depth max Schnitttiefe		 Ap (per cut/ pro Schnitt)					

1. Please select high precise machine and tool holder.
2. Please use air blow or cutting liquid with high mist retardant property.
3. Vibration and unusual noise may be generated if the machine rigidity and workpiece fixture stability is low, please reduce the rotating speed and feed rate like mentioned above.
4. Make overhang as short as possible if no interference.

1. Bitte präzise Maschine und Werkzeugaufnahmen wählen.
2. Bitte Luftkühlung oder Schneidflüssigkeit benutzen.
3. Bei Vibrationen oder unüblichen Geräuschen reduzieren Sie die Schnittdaten entsprechend.
4. Werkzeugauskragung so auskragung so kurz wie möglich wählen.

Recommended cutting data · Empfohlene Schnittdaten

HM-2ES

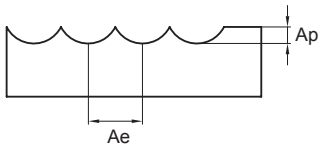
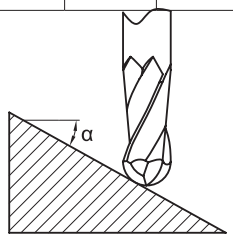
Workpiece material Werkstückstoff	Pre-hardened steel, Hardened steel Vergüteter Stahl, gehärteter Stahl 40~50HRC		Hardened steel gehärteter Stahl 50~60HRC	
Diameter Ø (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)
0.3	32000	150	25000	120
0.4	32000	200	25000	160
0.5	21000	400	17000	300
0.6	21000	480	17000	380
0.7	20000	520	14000	360
0.8	20000	560	14000	400
0.9	17000	560	12000	400
1.0	17000	640	12000	450
1.5	12000	800	8000	530
2.0	9000	800	6000	500
2.5	8000	720	5000	420
3.0	7000	640	5000	450
Max. cutting depth max Schnitttiefe		Milling slot · Nutenfräsen: Ø / Ap — D<Ø1: 0.02D; Ø1≤D≤Ø3: 0.05D		Milling slot · Nutenfräsen: Ø / Ap — D<Ø1: 0.01D; Ø1≤D≤Ø3: 0.02D

1. Please select high precise machine and tool holder.
2. Please use air blow or cutting liquid with high mist retardant property.
3. Make overhang as short as possible if no interference.
4. Reduce feed correspondingly when rotating speed is low.

1. Bitte präzise Maschine und Werkzeugaufnahmen wählen
2. Bitte Luftkühlung oder MQL (Minimalmenge) benutzen.
3. Empfohlene Fräsmethode: Gleichlauffräsen.
4. Bitte Vorschub entsprechend reduzieren, wenn die Drehzahlen niedrig sind.

Recommended cutting data · Empfohlene Schnittdaten

HM-2B | HM-2BL | HM-2BFP

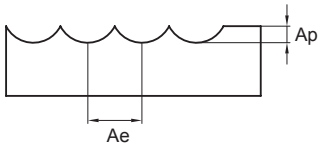
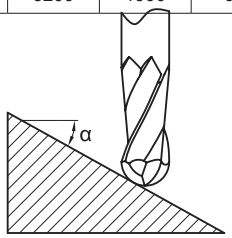
Workpiece material Werkstückstoff	Pre-hardened steel, Hardened steel Vergüteter Stahl, gehärteter Stahl 40~50HRC				Hardened steel gehärteter Stahl 50~60HRC				Hardened steel gehärteter Stahl 60~68HRC			
Radius of ball nose (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Ap (mm)	Ae (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Ap (mm)	Ae (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Ap (mm)	Ae (mm)
R0.5	40000	1900	0.01	0.05	36000	1500	0.01	0.05	32000	1400	0.01	0.05
R1.0	33000	3100	0.02	0.075	26000	2100	0.02	0.075	24000	2000	0.02	0.075
R1.5	29000	4100	0.03	0.1	23000	2900	0.03	0.1	21000	2600	0.03	0.1
R2.0	22000	3900	0.04	0.15	17000	2500	0.04	0.15	15500	2100	0.04	0.15
R2.5	17500	3500	0.05	0.15	13500	2200	0.05	0.15	13000	2000	0.05	0.15
R3.0	15000	3100	0.06	0.2	11500	1700	0.06	0.2	10500	1500	0.06	0.2
R4.0	11000	2500	0.08	0.25	8600	1600	0.08	0.25	8000	1400	0.08	0.25
R5.0	9000	2000	0.1	0.3	7000	1400	0.1	0.3	6000	1200	0.1	0.3
R6.0	7500	1800	0.1	0.35	5700	1300	0.1	0.35	5300	1200	0.1	0.35
R8.0	5500	1800	0.1	0.4	4300	1300	0.1	0.4	4000	1200	0.1	0.4
R10.0	4500	1800	0.1	0.5	3500	1300	0.1	0.5	3200	1200	0.1	0.5
Max. cutting depth max Schnitttiefe												

1. Please select machine and holder with high precision and rigidity.
2. Above table shows the standard for operations with a low change of machining load, such as Contour machining.Vibration and unusual noise may be generated if the machine rigidity and workpiece fixture stability is low, please reduce the rotating speed and feed stated above correspondingly.
3. Please use air blow or MQL (minimum oil mist cooling).
4. When inclination angle α is more than 15°, please reduce rotating speed and feed to 50%~80% of the above conditions.
5. Make overhang as short as possible if no interference.

1. Bitte präzise Maschine und Werkzeugaufnahmen wählen.
2. Schnittdatenempfehlung der obigen Tabelle sind für das Profilfräsen ausgelegt (leicht reduziert). Bei Vibrationen oder unüblichen Geräuschen reduzieren Sie die Schnittdaten entsprechend.
3. Bitte Luftkühlung oder MQL (Minimalmenge) benutzen.
4. Wenn der Neigungswinkel α mehr als 15° beträgt, bitte die Schnittgeschwindigkeit und den Vorschub auf 50-80% der obigen Schnittdaten reduzieren.
5. Empfohlene Fräsmethode: Gleichlauffräsen.

Recommended cutting data · Empfohlene Schnittdaten

HM-4B

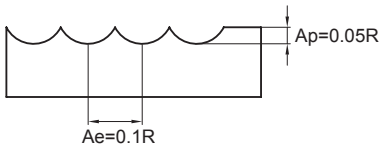
Workpiece material Werkstückstoff	Pre-hardened steel, Hardened steel Vergüteter Stahl, gehärteter Stahl 40~50HRC				Hardened steel gehärteter Stahl 50~60HRC				Hardened steel gehärteter Stahl 60~68HRC			
Radius of ball nose (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Ap (mm)	Ae (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Ap (mm)	Ae (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Ap (mm)	Ae (mm)
R1.5	29000	6560	0.03	0.1	22800	4560	0.03	0.1	21100	4240	0.03	0.1
R2.0	22000	6250	0.04	0.15	17100	4000	0.04	0.15	15800	3520	0.04	0.15
R2.5	17400	5600	0.05	0.15	13600	3520	0.05	0.15	12700	3200	0.05	0.15
R3.0	14500	5000	0.06	0.2	11400	3000	0.06	0.2	10600	2500	0.06	0.2
R4.0	10900	4200	0.08	0.25	8550	2500	0.08	0.25	7950	2250	0.08	0.25
R5.0	8700	3500	0.1	0.3	6850	2200	0.1	0.3	6350	2000	0.1	0.3
R6.0	7250	3000	0.1	0.35	5700	2000	0.1	0.35	5300	1900	0.1	0.35
R8.0	5450	3000	0.1	0.4	4280	2000	0.1	0.4	4000	1900	0.1	0.4
R10.0	4350	3000	0.1	0.5	3425	2000	0.1	0.5	3200	1900	0.1	0.5
Max. cutting depth max Schnitttiefe												

1. Please select machine and holder with high precision and rigidity.
2. Above table shows the standard for operations with a low change of machining load, such as Contour machining.Vibration and unusual noise may be generated if the machine rigidity and workpiece fixture stability is low, please reduce the rotating speed and feed stated above correspondingly.
3. Please use air blow or MQL(minimum oil mist cooling).
4. When inclination angle α is more than 15°, please reduce rotating speed and feed to 50%~80% of the above conditions.
5. Make overhang as short as possible if no interference.

1. Bitte präzise Maschinen und Werkzeughalter verwenden.
2. Schnittdatenempfehlung der obigen Tabelle sind für das Profilfräsen ausgelegt (leicht reduziert). Bei Vibrationen oder unüblichen Geräuschen reduzieren Sie die Schnittdaten entsprechend.
3. Bitte Luftkühlung oder MQL (Minimalmengen) benutzen
4. Wenn der Neigungswinkel α mehr als 15° beträgt, bitte die Schnittgeschwindigkeit und den Vorschub auf 50-80% der obigen Schnittdaten reduzieren.
5. Werkzeugauskragung so kurz wie möglich wählen.

Recommended cutting data · Empfohlene Schnittdaten

HM-2BS

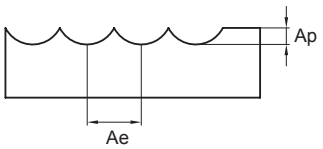
Workpiece material Werkstückstoff	Pre-hardened steel, Hardened steel Vergüteter Stahl, gehärteter Stahl 40~50HRC		Hardened steel gehärteter Stahl 50~60HRC	
Diameter Ø (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)
R0.15	25000	135	25000	115
R0.2	25000	140	25000	120
R0.25	25000	150	25000	130
R0.3	25000	175	24000	150
R0.35	25000	190	24000	150
R0.4	24000	210	18000	140
R0.45	21000	210	15000	140
R0.5	19000	210	14000	140
R1.0	9500	210	7200	140
R1.5	6400	210	4800	140
Max. cutting depth max Schnitttiefe				

1. Please select high precise machine and tool holder.
2. Please use air blow or cutting liquid with high mist retardant property.
3. Make overhang as short as possible if no interference.
4. Reduce Feed correspondingly when rotating speed is low.

1. Bitte präzise Maschine und Werkzeugaufnahmen wählen
2. Bitte Luftkühlung oder MQL (Minimalmengen) benutzen.
3. Werkzeugauskragung so kurz wie möglich wählen.
4. Bitte Vorschub entsprechend reduzieren, wenn die Drehzahlen niedrig sind.

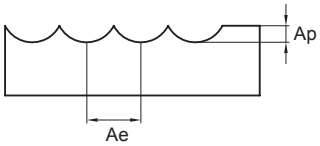
Recommended cutting data · Empfohlene Schnittdaten

HM-2BP

Workpiece material Werkstückstoff		Pre-hardened steel, Hardened steel Vergüteter Stahl, gehärteter Stahl 40~50HRC				Hardened steel gehärteter Stahl 50~60HRC			
Diameter Ø (mm)	Effective length (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Ap (mm)	Ae (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Ap (mm)	Ae (mm)
R0.25	**4**	27000	200	0.01	0.01	27000	100	0.01	0.01
	6	20000	150	0.005	0.01	20000	75	0.005	0.005
R0.3	**4**	24000	200	0.03	0.06	17000	150	0.02	0.04
	6	20000	150	0.02	0.03	17000	150	0.01	0.02
	8	20000	120	0.02	0.03	17000	120	0.01	0.02
R0.4	**4**	21000	300	0.04	0.08	14500	200	0.03	0.08
	6	19000	200	0.02	0.04	12000	150	0.02	0.04
	8	17000	150	0.02	0.04	12000	100	0.02	0.04
	10	17000	135	0.02	0.03	12000	75	0.01	0.02
R0.5	**4**	21000	300	0.05	0.10	14500	200	0.05	0.10
	6	16000	200	0.05	0.10	11500	150	0.05	0.10
	8	16000	180	0.03	0.05	11500	135	0.03	0.05
	10	14000	150	0.01	0.03	9800	100	0.01	0.03
	12	14000	135	0.01	0.03	9800	75	0.01	0.03
R0.6	**6**	14000	200	0.06	0.12	9500	175	0.06	0.12
	8	14000	180	0.06	0.12	9500	150	0.06	0.12
	12	11000	150	0.04	0.06	7500	100	0.03	0.06
	16	11000	135	0.02	0.04	7500	75	0.02	0.03
R0.75	**8**	12000	250	0.08	0.15	8000	200	0.08	0.15
	12	12000	225	0.06	0.15	8000	175	0.06	0.15
	16	9500	150	0.01	0.05	6500	100	0.01	0.03
R1.0	**6**	13500	400	0.10	0.20	7500	225	0.10	0.20
	8	13500	400	0.10	0.16	7500	225	0.10	0.16
	10	10000	275	0.08	0.16	5500	175	0.08	0.16
	12	10000	275	0.06	0.16	5500	175	0.06	0.16
	16	10000	250	0.02	0.10	5500	150	0.02	0.10
	20	8000	175	0.02	0.05	5500	125	0.01	0.05
Max. cutting depth max Schnitttiefe									

Recommended cutting data · Empfohlene Schnittdaten

HM-2BP

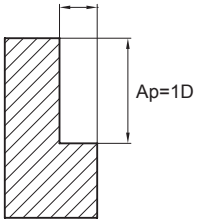
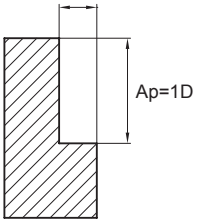
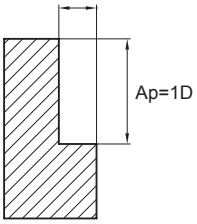
Workpiece material Werkstückstoff		Pre-hardened steel, Hardened steel Vergüteter Stahl, gehärteter Stahl 40~50HRC				Hardened steel gehärteter Stahl 50~60HRC			
Diameter Ø (mm)	Effective length (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Ap (mm)	Ae (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Ap (mm)	Ae (mm)
R1.25	8	12500	400	0.10	0.16	7000	225	0.10	0.16
	12	9000	275	0.06	0.16	5000	175	0.06	0.16
	16	9000	250	0.02	0.10	5000	150	0.02	0.10
	20	5500	175	0.02	0.05	5000	125	0.01	0.05
R1.5	8	7500	400	0.15	0.30	4000	200	0.15	0.30
	10	7500	400	0.10	0.30	4000	200	0.10	0.30
	12	7500	360	0.10	0.30	4000	180	0.10	0.30
	16	6500	250	0.05	0.20	3000	150	0.05	0.20
	20	6500	250	0.02	0.10	3000	150	0.02	0.05
R2.0	10	6000	400	0.20	0.40	3000	200	0.20	0.40
	16	6000	400	0.10	0.32	3000	200	0.20	0.20
	20	5000	250	0.10	0.20	2500	100	0.10	0.20
	25	5000	250	0.10	0.20	2500	100	0.10	0.10
R2.5	16	5000	400	0.25	0.50	3000	200	0.2	0.2
	25	4000	250	0.25	0.50	3000	100	0.20	0.2
Max. cutting depth max Schnitttiefe									

1. Please select high precise machine and tool holder.
2. Please use air blow or cutting liquid with high mist retardant property.
3. Make overhang as short as possible if no interference.
4. Reduce Feed correspondingly when rotating speed is low.

1. Bitte präzise Maschine und Werkzeugaufnahmen wählen
2. Bitte Luftkühlung oder MQL (Minimalmengen) benutzen.
3. Werkzeugauskragung so kurz wie möglich wählen.
4. Bitte Vorschub entsprechend reduzieren, wenn die Drehzahlen niedrig sind.

Recommended cutting data · Empfohlene Schnittdaten

HM-4R | HM-4RP | HM-4RF

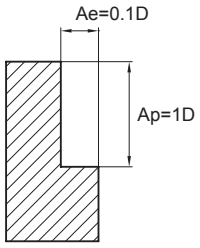
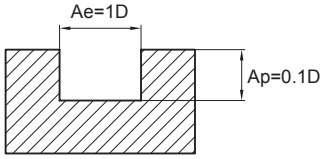
Workpiece material Werkstückstoff	Pre-hardened steel, Hardened steel Vergüteter Stahl, gehärteter Stahl 40~50HRC		Hardened steel gehärteter Stahl 50~60HRC		Hardened steel gehärteter Stahl 60~68HRC	
Cutting speed Schnittgeschw.	300m/min		150m/min		100m/min	
Diameter Ø (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)
3	32000	1225	16000	610	11000	420
4	24000	1500	12000	745	8000	500
5	19000	1630	9500	815	6400	550
6	16000	1850	8000	925	5300	610
8	12000	1850	6000	925	4000	610
10	9600	1850	4800	925	3200	610
12	8000	1920	4000	960	2700	648
16	6000	1440	3000	720	2000	480
Max. cutting depth max Schnitttiefe	Ae=0.05D  Maximum Ae=1.0mm		Ae=0.03D  Maximum Ae=0.5mm		Ae=0.02D  Maximum Ae=0.3mm	

1.Please select machine and holder with high precision and rigidity.
2.Vibration and unusual noise may be generated if the machine rigidity and workpiece fixture stability is low, please reduce the rotating speed and feed stated above correspondingly.
3.Please use air blow or MQL(minimum oil mist cooling).
4.Down milling is recommended in side milling.
5.Make overhang as short as possible if no interference.

1. Bitte Maschine und Werkzeugaufnahme mit hoher Präzission und Stabilität wählen.
2. Bei Vibrationen oder unüblichen Geräuschen reduzieren Sie die Schnittdaten entsprechend.
3. Als Kühlmittel bitte Luft oder MQL (Minimalmengen) verwenden.
4. Fräsmethode zum Eckfräsen: Gleichlauffräsen.
5. Die Werkzeugauskragung so kurz wie möglich wählen.

Recommended cutting data · Empfohlene Schnittdaten

NM-2E

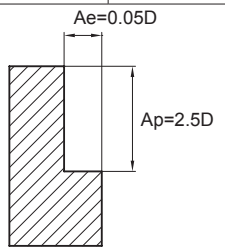
Workpiece material Werkstückstoff	Copper/Copper alloy Kupfer/ Kupferlegierung	
Diameter Ø (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)
1	40000	1800
2	30000	2500
3	20000	2300
4	15000	2000
5	12000	1500
6	10000	1400
8	8000	1000
10	6500	900
12	5500	850
Max. cutting depth max Schnitttiefe	 Maximum Ae=1.0mm	 Maximum Ap=1.0mm

1.The above table shows the reference value of side milling. The Feed in slot milling is recommended 70% of reference value stated above.
2.Please select high rigid and precise machine and tool holder. Vibration and unusual noise may be generated if the machine rigidity and workpiece fixture stability is low, please reduce the rotating speed and feed stated above correspondingly.
3.It is possible to increase the rotating speed and Feed correspondingly if the cutting depth is small.
4.Please use water-soluble cutting liquid.
5.Down milling is recommended in side milling.
6.Make overhang as short as possible if no interference.

1. Die obige Tabelle zeigt die Referenz Schnittdaten für das Eckfräsen.
Für das Nutenfräsen die obigen Schnittdaten um 30 % reduzieren.
2. Bitte präzise Maschinen und Werkzeughalter verwenden. Bei Vibrationen oder unüblichen Geräuschen reduzieren Sie die Schnittdaten entsprechend.
3. Schnittdaten bei kleinen Schnitttiefen erhöhen.
4. Bitte wasserlösliche Kühlmittel verwenden.
5. Fräsmethode zum Eckfräsen: Gleichlauffräsen.
6. Die Werkzeugauskragung so kurz wie möglich wählen.

Recommended cutting data · Empfohlene Schnittdaten

NM-4E

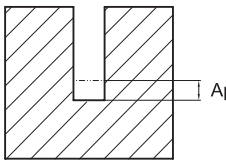
Workpiece material Werkstückstoff	Copper/Copper alloy Kupfer/ Kupferlegierung	
Diameter Ø (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)
3	10600	250
4	8000	300
5	6500	400
6	5300	400
8	4000	450
10	3500	450
12	3000	450
Max. cutting depth max Schnitttiefe	 Maximum Ap=0.5mm	

1.Please select high rigid and precise machine and tool holder. Vibration and unusual noise may be generated if the machine rigidity and workpiece fixture stability is low, please reduce the rotating speed and feed stated above correspondingly.
2.It is possible to increase the rotating speed and feed correspondingly if the cutting depth is small.
3.Please use water-soluble cutting liquid.
4.Down milling is recommended in side milling.
5.Make overhang as short as possible if no interference.

1. Bitte Maschine und Werkzeugaufnahme mit hoher Präzission und Stabilität wählen. Bei Vibrationen oder unüblichen Geräuschen reduzieren Sie die Schnittdaten entsprechend.
2. Schnittdaten bei kleinen Schnitttiefen erhöhen.
3. Bitte wasserlösliche Kühlmittel verwenden.
4. Fräsmethode zum Eckfräsen: Gleichlauffräsen.
5. Die Werkzeugauskragung so kurz wie möglich wählen.

Recommended cutting data · Empfohlene Schnittdaten

NM-2EP

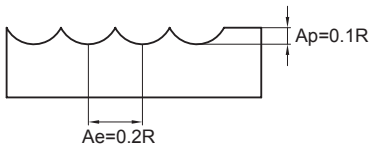
Workpiece material Werkstückstoff		Copper/Copper alloy Kupfer/ Kupferlegierung		
Diameter Ø (mm)	Effective length (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Ap (mm)
0.5	4	40000	800	0.004
	6	40000	700	0.002
	8	40000	500	0.001
0.8	4	40000	1000	0.02
	6	40000	1000	0.015
	8	40000	800	0.01
	10	40000	600	0.005
1.0	4	40000	1800	0.04
	6	40000	1500	0.04
	8	40000	1500	0.03
	10	30000	1000	0.02
	12	30000	800	0.015
	14	30000	600	0.01
1.5	8	40000	2000	0.09
	16	20000	1000	0.03
2.0	6	40000	2400	0.18
	8	40000	2200	0.15
	10	40000	2000	0.12
	12	30000	1500	0.10
	14	30000	1200	0.08
	16	30000	1000	0.06
2.5	10	40000	2500	0.15
	20	20000	1000	0.08
3.0	10	20000	2500	0.20
	20	20000	2000	0.12
4.0	16	15000	1800	0.25
	25	15000	1200	0.15
5.0	16	12000	2000	0.40
	25	12000	1500	0.35
Max. cutting depth max Schnitttiefe		 Ap (per cut/ pro Schnitt)		

1. Please select high precise machine and tool holder.
2. Please use water-soluble cutting liquid.
3. Make overhang as short as possible if no interference.

1. Bitte Maschine und Werkzeugaufnahme mit hoher Präzission und Stabilität wählen.
2. Bitte wasserlösliche Kühlmittel verwenden.
3. Die Werkzeugauskragung so kurz wie möglich wählen.

Recommended cutting data · Empfohlene Schnittdaten

NM-2B

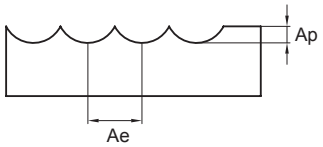
Workpiece material Werkstückstoff	Copper/Copper alloy Kupfer/ Kupferlegierung	
Diameter Ø (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)
R0.5	40000	900
R0.75	32000	800
R1.0	24000	870
R1.25	19000	800
R1.5	16000	850
R1.75	14000	850
R2.0	12000	900
R2.5	9600	900
R3.0	8000	1200
R4.0	7000	1500
R5.0	4800	1300
R6.0	4000	1200
Max. cutting depth max Schnitttiefe		

1. Please select high rigid and precise machine and tool holder. Vibration and unusual noise may be generated if the machine rigidity and workpiece fixture stability is low, please reduce the rotating speed and feed stated above correspondingly.
2. It is possible to increase the rotating speed and feed correspondingly if the cutting depth is small.
3. Please use water-soluble cutting liquid.
4. Make overhang as short as possible if no interference.

1. Bitte Maschine und Werkzeugaufnahme mit hoher Präzission und Stabilität wählen. Bei Vibrationen oder unüblichen Geräuschen reduzieren Sie die Schnittdaten (wie oben empfohlen) entsprechend.
2. Schnittdaten bei kleinen Schnitttiefen erhöhen.
3. Bitte wasserlösliche Kühlmittel verwenden.
4. Die Werkzeugauskragung so kurz wie möglich wählen.

Recommended cutting data · Empfohlene Schnittdaten

NM-2BP

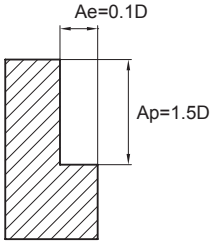
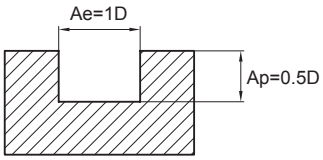
Workpiece material Werkstückstoff		Copper/Copper alloy Kupfer/ Kupferlegierung			
Diameter Ø (mm)	Effective length (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Ap (mm)	Ae (mm)
R0.25	4	40000	750	0.01	0.025
	6	36000	500	0.008	0.02
R0.3	4	40000	900	0.012	0.03
	6	40000	750	0.010	0.02
	8	30000	400	0.008	0.01
R0.4	4	40000	1050	0.016	0.04
	6	40000	800	0.012	0.03
	8	40000	500	0.01	0.02
	10	30000	400	0.008	0.01
R0.5	4	40000	1050	0.02	0.05
	6	40000	800	0.016	0.04
	8	40000	500	0.014	0.03
	10	33000	400	0.012	0.02
	12	35000	300	0.010	0.010
R0.75	8	40000	900	0.03	0.075
	16	20000	400	0.015	0.04
R1.0	6	40000	1100	0.04	0.10
	8	40000	900	0.034	0.08
	10	40000	750	0.028	0.065
	12	40000	500	0.022	0.05
	16	30000	400	0.018	0.04
	20	20000	300	0.012	0.03
R1.5	10	40000	1100	0.06	0.15
	20	32000	600	0.03	0.08
R2.0	10	32000	1100	0.08	0.20
	16	32000	900	0.06	0.16
	20	32000	600	0.04	0.12
	25	20000	400	0.02	0.08
R2.5	16	25000	1250	0.10	0.25
	25	20000	900	0.06	0.12
Max. cutting depth max Schnitttiefe					

1.Please select high precise machine and tool holder.
2.Please use water-soluble cutting liquid.
3.Make overhang as short as possible if no interference.

1. Bitte Maschine und Werkzeugaufnahme mit hoher Präzission und Stabilität wählen.
2. Bitte wasserlösliche Kühlmittel verwenden.
3. Die Werkzeugauskragung so kurz wie möglich wählen.

Recommended cutting data · Empfohlene Schnittdaten

AL-2E | AL-2EL

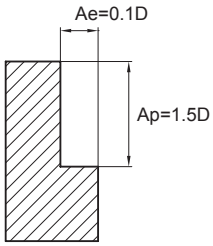
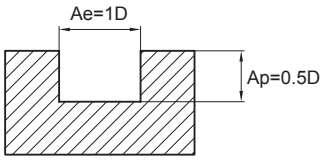
Workpiece material Werkstückstoff	Aluminum alloy Alu Legierungen		Silicon aluminium alloySi≤10% Silizium Alu Legierungen Si≤10%	
Diameter Ø (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)
1	40000	650	40000	500
2	40000	950	32000	750
3	26500	1500	21000	1100
4	20000	1600	16000	1250
5	16000	1500	13000	1100
6	13000	1250	10600	1000
8	10000	1400	8000	1100
10	8000	1600	6500	1250
12	6600	1650	5300	1300
14	5700	1700	4600	1350
16	5000	1700	4000	1350
18	4400	1700	3500	1350
20	4000	1700	3200	1350
Max. cutting depth max Schnitttiefe				

1.The above table shows the reference value of side milling. The Feed in slot milling is recommended 70% of reference value stated above.
2. Please select high rigid and precise machine and tool holder. Vibration and unusual noise may be generated if the machine rigidity and workpiece fixture stability is low, please reduce the rotating speed and feed stated above correspondingly.
3.It is possible to increase the rotating speed and feed correspondingly if the cutting depth is small.
4.Please use water-soluble cutting liquid.
5.Down milling is recommended in side milling.
6.Make overhang as short as possible if no interference.

1. Die obige Tabelle zeigt die Referenz Schnittdaten für das Eckfräsen.
Für das Nutenfräsen die obigen Schnittdaten auf 70 % reduzieren.
2. Bitte präzise Maschinen und Werkzeughalter verwenden. Bei Vibrationen oder unüblichen Geräuschen reduzieren Sie die Schnittdaten (wie oben empfohlen) entsprechend.
3. Schnittdaten bei kleinen Schnitttiefen erhöhen.
4. Bitte wasserlösliche Kühlmittel verwenden.
5. Fräsmethode zum Eckfräsen: Gleichlauffräsen.
6. Die Werkzeugauskragung so kurz wie möglich wählen.

Recommended cutting data · Empfohlene Schnittdaten

AL-3E

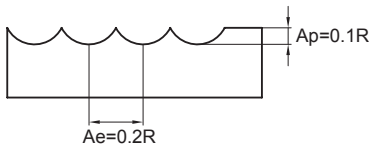
Workpiece material Werkstückstoff	Aluminum alloy Alu Legierungen		Silicon aluminium alloySi≤10% Silizium Alu Legierungen Si≤10%	
Diameter Ø (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)
1	40000	800	40000	600
2	40000	1200	32000	900
3	26500	1800	21000	1300
4	20000	2000	16000	1500
5	16000	1750	13000	1300
6	13000	1500	10600	1200
8	10000	1650	8000	1300
10	8000	1900	6500	1500
12	6600	1950	5300	1550
14	5700	2000	4600	1600
16	5000	2000	4000	1600
18	4400	2000	3500	1600
20	4000	2000	3200	1600
Max. cutting depth max Schnitttiefe				

1.The above table shows the reference value of side milling. The feed in slot milling is recommended 70% of reference value stated above.
2.Please select high rigid and precise machine and tool holder. Vibration and unusual noise may be generated if the machine rigidity and workpiece fixture stability is low, please reduce the rotating speed and feed stated above correspondingly.
3.It is possible to increase the rotating speed and feed correspondingly if the cutting depth is small.
4.Please use water-soluble cutting liquid.
5.Down milling is recommended in side milling.
6.Make overhang as short as possible if no interference.

1. Die obige Tabelle zeigt die Referenz Schnittdaten für das Eckfräsen.
Für das Nutenfräsen die obigen Schnittdaten um 30 % reduzieren.
2.Bitte Maschine und Werkzeugaufnahme mit hoher Präzission und Stabilität wählen. Bei Vibrationen oder unüblichen Geräuschen reduzieren Sie die Schnittdaten (wie oben empfohlen) entsprechend.
3. Schnittdaten bei kleinen Schnitttiefen erhöhen.
4. Bitte wasserlösliche Kühlmittel verwenden.
5. Fräsmethode zum Eckfräsen: Gleichlauffräsen.
6. Die Werkzeugauskragung so kurz wie möglich wählen.

Recommended cutting data · Empfohlene Schnittdaten

AL-2B

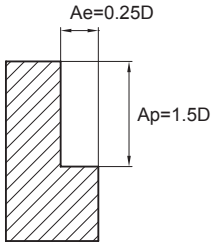
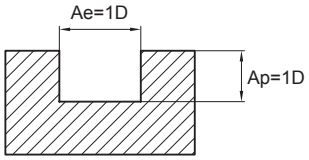
Workpiece material Werkstückstoff	Aluminum alloy Alu Legierungen		Silicon aluminium alloySi≤10% Silizium Alu Legierungen Si≤10%	
Diameter Ø (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)
R1.0	40000	2000	32000	1600
R1.5	26500	1950	21000	1550
R2.0	20000	1950	16000	1550
R2.5	16000	1950	13000	1550
R3.0	13000	2000	10600	1600
R4.0	10000	2450	8000	2000
R5.0	8000	2200	6500	1750
R6.0	6600	2050	5300	1650
Max. cutting depth max Schnitttiefe				

1.Please select high rigid and precise machine and tool holder. Vibration and unusual noise may be generated if the machine rigidity and workpiece fixture stability is low, please reduce the rotating speed and feed stated above correspondingly.
2.It is possible to increase the rotating speed and feed correspondingly if the cutting depth is small.
3.Please use water-soluble cutting liquid.
4.Make overhang as short as possible if no interference.

1. Bitte Maschine und Werkzeugaufnahme mit hoher Präzission und Stabilität wählen. Bei Vibrationen oder unüblichen Geräuschen reduzieren Sie die Schnittdaten (wie oben empfohlen) entsprechend.
2. Schnittdaten bei kleinen Schnitttiefen erhöhen.
3. Bitte wasserlösliche Kühlmittel verwenden.
4. Die Werkzeugauskragung so kurz wie möglich wählen.

Recommended cutting data · Empfohlene Schnittdaten

AL-3W

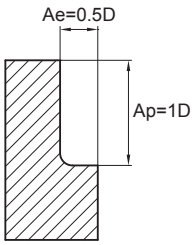
Workpiece material Werkstückstoff	Aluminum alloy Alu Legierungen		Silicon aluminium alloySi≤10% Silizium Alu Legierungen Si≤10%	
Cutting speed Schnittgeschw.	250m/min		200m/min	
Diameter Ø (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)
6	13000	3000	10600	1900
8	10000	3000	8000	1900
10	8000	2900	6500	1850
12	6600	2700	5300	1700
14	5700	2600	4600	1650
16	5000	2550	4000	1600
18	4400	2500	3500	1550
20	4000	2400	3200	1500
Max. cutting depth max Schnitttiefe				

1.The above table shows the reference value of side milling. When milling slot, rotating speed is around 70% of standard value, Feed is around 50% of standard value.
2.Please select high rigid and precise machine and tool holder. Vibration and unusual noise may be generated if the machine rigidity and workpiece fixture stability is low, please reduce the rotating speed and feed stated above correspondingly.
3.It is possible to increase the rotating speed and feed correspondingly if the cutting depth is small.
4.Please use water-soluble cutting liquid.
5.Down milling is recommended in side milling.
6.Make overhang as short as possible if no interference.

1. Die obige Tabelle zeigt die Referenz Schnittdaten für das Eckfräsen.
Für das Nutenfräsen die obigen Schnittdaten auf 70 % reduzieren.
2. Bitte präzise Maschinen und Werkzeughalter verwenden. Bei Vibrationen oder unüblichen Geräuschen reduzieren Sie die Schnittdaten (wie oben empfohlen) entsprechend.
3. Schnittdaten bei kleinen Schnitttiefen erhöhen.
4. Bitte wasserlösliche Kühlmittel verwenden.
5. Fräsmethode zum Eckfräsen: Gleichlauffräsen.
6. Die Werkzeugauskragung so kurz wie möglich wählen.

Recommended cutting data · Empfohlene Schnittdaten

AL-2R-AIR

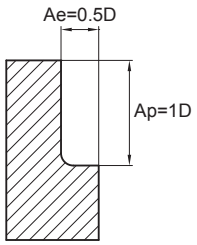
Workpiece material Werkstückstoff	Aluminum alloy Alu Legierungen		Silicon aluminium alloySi≤10% Silizium Alu Legierungen Si≤10%	
Cutting speed Schnittgeschw.	500~800m/min		500~800m/min	
Diameter Ø (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)
6	35000	3500	35000	3500
8	26000	3800	26000	3800
10	21000	4000	21000	4000
12	18000	4300	18000	4300
16	15000	4800	15000	4800
20	12000	5500	12000	5500
Max. cutting depth max Schnitttiefe				

1. The cutting parameters above are applied for high speed machining Al alloy.
2. Please use cutting liquid or strong air blow to remove chips.
3. Sparks generated during machining process or heat caused by tool breakage may cause burning or fire. Please be careful of fireproof.
4. Dynamic balance test must be done before machining.

1. Obige Schnittdaten sind Hochgeschwindigkeits-Schnittdaten für die Bearbeitung von Alu Legierungen.
2. Bitte Kühlschmiermittel oder Luft mit hohem Druck zur Spanabfuhr benutzen.
3. Während der Bearbeitung können durch Funken Feuer entstehen. Bitte Vorkehrungen treffen.
4. Dynamische Auswuchtvorschriften beachten.

Recommended cutting data · Empfohlene Schnittdaten

AL-2RL-AIR

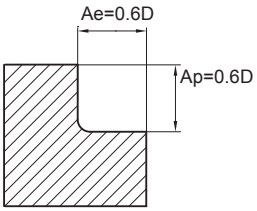
Workpiece material Werkstückstoff	Aluminum alloy Alu Legierungen		Silicon aluminium alloySi≤10% Silizium Alu Legierungen Si≤10%	
Cutting speed Schnittgeschw.	500~800m/min		500~800m/min	
Diameter Ø (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)
6	30000	3000	30000	3000
8	24000	3200	24000	3200
10	20000	3500	20000	3500
12	16000	3800	16000	3800
16	12000	4000	12000	4000
20	10000	4600	10000	4600
Max. cutting depth max Schnitttiefe				

1.The cutting parameters above are applied for high speed machining Al alloy.
2. Please use cutting liquid or strong air blow to remove chips.
3. Sparks generated during machining process or heat caused by tool breakage may cause burning or fire. Please be careful of fireproof.
4. Dynamic balance test must be done before machining.

1. Obige Schnittdaten sind Hochgeschwindigkeits-Schnittdaten für die Bearbeitung von Alu Legierungen.
2. Bitte Kühlschmiermittel oder Luft mit hohem Druck zur Spanabfuhr benutzen.
3. Während der Bearbeitung können durch Funken Feuer entstehen. Bitte Vorkehrungen treffen.
4. Dynamische Auswuchtvorschriften beachten.

Recommended cutting data · Empfohlene Schnittdaten

AL-3R-AIR

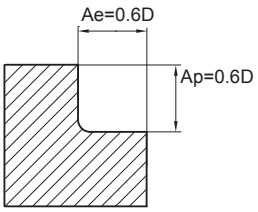
Workpiece material Werkstückstoff	Aluminum alloy Alu Legierungen		Silicon aluminium alloySi≤10% Silizium Alu Legierungen Si≤10%	
Cutting speed Schnittgeschw.	800~1200m/min		800~1200m/min	
Diameter Ø (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)
12	25000	6000	25000	6000
16	20000	6400	20000	6400
20	15000	7000	15000	7000
Max. cutting depth max Schnitttiefe				

1.The cutting parameters above are applied for high speed machining Al alloy.
2.Please use cutting liquid or strong air blow to remove chips.
3.Sparks generated during machining process or heat caused by tool breakage may cause burning or fire. Please be careful of fireproof.
4.Dynamic balance test must be done before machining.

1. Obige Schnittdaten sind Hochgeschwindigkeits-Schnittdaten für die Bearbeitung von Alu Legierungen.
2. Bitte Kühlschmiermittel oder Luft mit hohem Druck zur Spanabfuhr benutzen.
3. Während der Bearbeitung können durch Funken Feuer entstehen. Bitte Vorkehrungen treffen.
4. Dynamische Auswuchtvorschriften beachten.

Recommended cutting data · Empfohlene Schnittdaten

AL-3RL-AIR

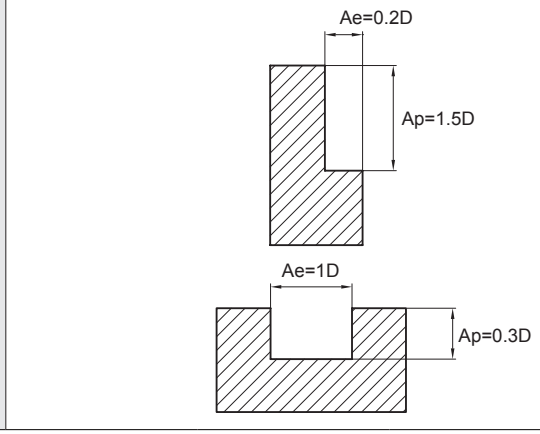
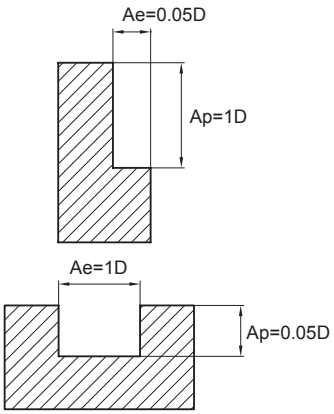
Workpiece material Werkstückstoff	Aluminum alloy Alu Legierungen		Silicon aluminium alloySi≤10% Silizium Alu Legierungen Si≤10%	
Cutting speed Schnittgeschw.	800~1200m/min		800~1200m/min	
Diameter Ø (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)
12	22000	5300	22000	5300
16	18000	5700	18000	5700
20	13000	6000	13000	6000
Max. cutting depth max Schnitttiefe				

1.The cutting parameters above are applied for high speed machining Al alloy.
2.Please use cutting liquid or strong air blow to remove chips.
3.Sparks generated during machining process or heat caused by tool breakage may cause burning or fire. Please be careful of fireproof.
4.Dynamic balance test must be done before machining.

1. Obige Schnittdaten sind Hochgeschwindigkeits-Schnittdaten für die Bearbeitung von Alu Legierungen.
2. Bitte Kühlschmiermittel oder Luft mit hohem Druck zur Spanabfuhr benutzen.
3. Während der Bearbeitung können durch Funken Feuer entstehen. Bitte Vorkehrungen treffen.
4. Dynamische Auswuchtvorschriften beachten.

Recommended cutting data · Empfohlene Schnittdaten

VSM-4E

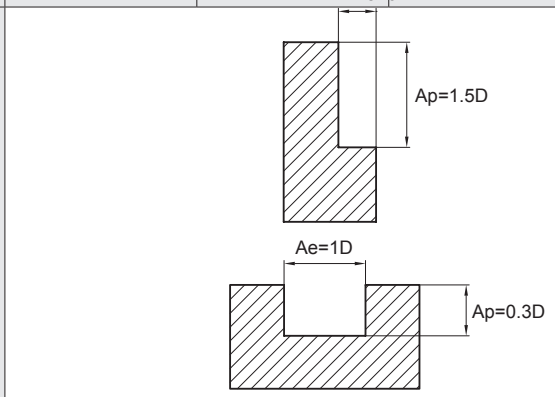
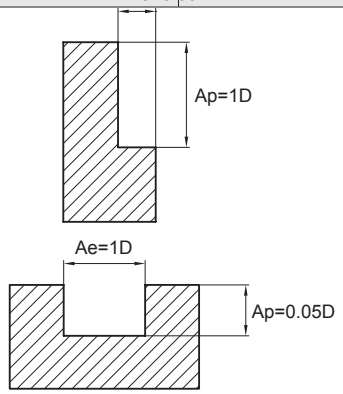
Workpiece material Werstück-material	Carbon steel/Alloy steel Kohlenstoff Stahl/ legierter Stahl		Stainless steel · Rostfreier Stahl		Heat resist. alloy/ Warmfeste Leg. Titanium alloy/ Titan-Legier.	
Diameter Ø (mm)	Rotating Drehzahl (min^{-1})	Feed (mm/min)	Rotating Drehzahl (min^{-1})	Feed (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)
4	6400	1200	3700	590	2350	180
5	5800	1300	3000	600	1900	190
6	5300	1500	2700	640	1900	220
8	3900	1100	2000	480	1400	170
10	3100	930	1600	400	1100	150
12	2600	780	1300	360	950	140
16	1900	680	1000	280	720	120
20	1500	540	800	260	570	95
Max. cutting depth max Schnitttiefe						

1.The above table shows the standard value of side milling. When slot milling , rotating speed is around 80%~100% of standard value, Feed is around 60%~80% of standard value.
2.Recommend using non water-soluble cutting liquid when machining stainless steel and Heat resist. alloy Warmfeste Leg..
3.Please select high rigid and precise machine and tool holder.
4.Adjust rotating speed and feed according to cutting depth and machine rigidity.
5.Down milling is recommended in side milling.
6.Make overhang as short as possible if no interference.

1. Die obige Tabelle zeigt Standart Schnittwerte für das Eckfräsen, beim Nutenfräsen die Schnittgeschwindigkeit auf ca. 80% und den Vorschub auf 60%-80% reduzieren.
2. Nicht wasserlösliche Kühlschmiermittel verwenden.
3. Bitte Maschine und Werkzeugaufnahme mit hoher Präzission und Stabilität wählen.
4. Schnittgeschwindigkeit und Vorschub der Schnitttiefe und Maschinenstabilität anpassen.
5. Fräsmethode zum Eckfräsen: Gleichlauffräsen.
6. Die Werkzeugauskragung so kurz wie möglich wählen.

Recommended cutting data · Empfohlene Schnittdaten

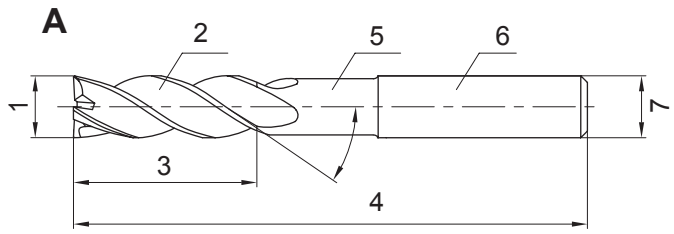
SM-4R

Workpiece material Werkstück-material	Carbon steel/Alloy steel Kohlenstoff Stahl/ legierter Stahl		Stainless steel · Rostfreier Stahl		Heat resist. alloy/ Warmfeste Leg. Titanium alloy/ Titan-Legier.	
Diameter Ø (mm)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)	Rotating Drehzahl (min^{-1})	Feed Vorschub (mm/min)
6	5300	750	2700	200	1900	90
8	3900	700	2000	210	1400	100
10	3100	640	1600	210	1100	100
12	2600	600	1300	170	950	85
Max. cutting depth max Schnitttiefe						

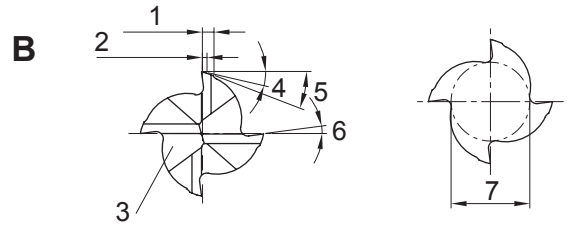
1.The above table shows the standard value of side milling. When slot milling, rotating speed is around 80%~100% of standard value, feed is around 60%~80% of standard value.
2.Recommend using water-insoluble cutting liquid when machining stainless steel and Heat resist. alloy Warmfeste Leg..
3.Please select high rigid and precise machine and tool holder.
4.Adjust rotating speed and feed according to cutting depth and machine rigidity.
5.Down milling is recommended in side milling.
6.Make overhang as short as possible if no interference.

1. Die obige Tabelle zeigt Standart Schnittwerte für das Eckfräsen, beim Nutenfräsen die Schnittgeschwindigkeit auf ca. 80% und den Vorschub auf 60%-80% reduzieren.
2. Nicht wasserlösliche Kühlschmiermittel verwenden.
3. Bitte Maschine und Werkzeugaufnahme mit hoher Präzission und Stabilität wählen.
4. Schnittgeschwindigkeit und Vorschub der Schnitttiefe und Maschinenstabilität anpassen.
5. Fräsmethode zum Eckfräsen: Gleichlauffräsen.
6. Die Werkzeugauskragung so kurz wie möglich wählen.

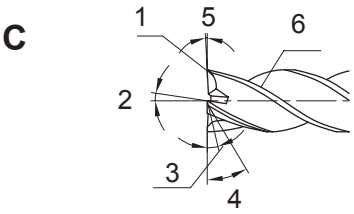
Parts terminology of end mill · Terminologie von VHM Fräsern



A 1) Cutting edge diameter / Schneiddurchmesser
2) Chip pocket/ Spanraum
3) Length of cutting edge/ Schneidenlänge
4) Overall length/ Gesamtlänge
5) Neck/ Hals
6) Shank/ Schaft
7) Shank diameter/ Schaftdurchmesser

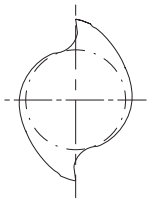
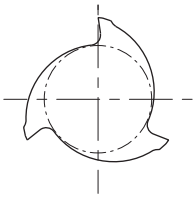
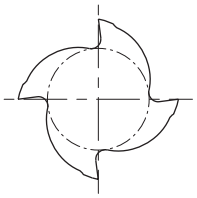


B 1) Land width/ Fasenbreite, Hauptschneide
2) Relief land width/ Fasenbreite, Durchmesser
3) Gash/ Freischliff, stirnseitig
4) Radial primary relief angle/ Primärer radial Freiwinkel
5) Radial secondary relief angle/ Sekundärer radial Freiwinkel
6) Radial rake angle/ Radial Spanwinkel
(7) Wep thickness – Kerndurchmesser



C 1) Corner/ Schneidecke
2) Axial rake angle/ axialer Spanwinkel
3) Axial primary relief angle/ axialer primärer Freiwinkel
4) Axial secondary relief angle/ axialer sekundärer Freiwinkel
5) Lead angle/ Neigungswinkel
6) Peripheral cutting edge/ Peripherie Schneidkante

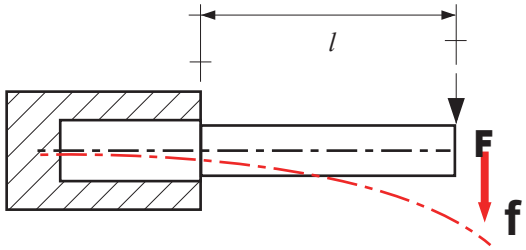
Teeth, chip pocket and tool rigidity · Zähne, Spanraum und Stabilität

Teeth · Zähne		2 Flutes · Schneiden	3 Flutes · Schneiden	4 Flutes · Schneiden
Profile of cross section Schnittdarstellung				
Proportion of cross section Anteil Schnittdarstellung		54%	56%	60%
Features Merkmal	Advantages Vorteile	• Large chip pocket • Good chip removal • Große Spankammer • Gute Spanabfuhr	• Good chip removal • Perfect surface finish • Gute Spanabfuhr • Gute Oberflächengüte	• Good rigidity • Perfect surface finish • Gute Steifigkeit • Gute Oberflächengüte
Application Anwendung		1. Slot machining 2. Side face machining 3. Hole machining 1. Nutenfräsen 2. Eckfräsen 3. Bohrungsbearbeitung	1. Slot machining 2. Side face machining 3. For finishing 1. Nutenfräsen 2. Eckfräsen 3. Schlichtbearbeitung	1.Shallow slot machining 2.Side face machining 3.For finishing 1.Nutenfräsen (flach) 2.Eckfräsen 3.Schlichtbearbeitung

Length of cutting edge (overhang) and cutting diameter
Länge der Schneidenauskragung und Schneidendurchmesser

The shorter the overhang, the stronger the rigidity. Thus isn´t easy to generate. Bend and vibration in the cutting process may accrue. Length (overhang) increases by 1 time, the Deflection degree (f) will be 8 times of the former one.

Je kürzer die Werkzeugauskragung, um so stabiler ist die Bearbeitungssituation.
Während der Bearbeitung können Werkzeugdurchbiegungen und Vibrationen entstehen.
Bei Vergrößerung der Auskragung um 100% wird der Deflektionsgrad (Ablenkung) um das 8-fache erhöht.

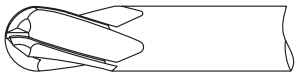
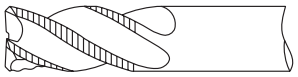
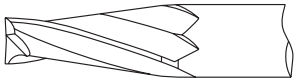


$$f = \frac{F \cdot l^3}{3 \cdot E \cdot I} = \frac{F \cdot l^3 \cdot 64}{3 \cdot E \cdot d^4 \cdot \pi}$$

Reduce the overhang by 20%, the Deflection degree (f) will decrease by 50%
Increase the diameter by 20%, the Deflection degree (f) will decrease by 50%

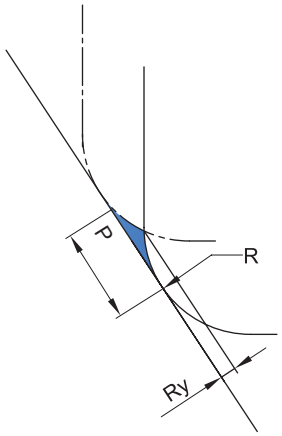
Bei Reduzierung der Auskragung um 20 % reduziert sich der Deflektionsgrad (Ablenkung) um 50 %.
Bei Vergrößerung des Werkzeugdurchmessers, um 20 % reduziert sich der Deflektionsgrad (Ablenkung) um 50 %.

Typical geometries of end mills · Typische Geometrien von Schaftfräsern

Type · Typ	Geometry · Ausführung
end mill Schaftfräser	
R end mill Radiuseckfräser	
Ball nose end mill Kugelkopffräser	
Roughing end mill Schruppfräser	
Tapered end mill Konusfräser	

Technical information · Technische Informationen

Feed rate selecting table in profile machining for ball nose and R end mills
Vorschubwerte für das Formfräsen mit Kugelkopffräsern und Radiuseckfräsern



$$Ry=R\times\{1-\cos[\arcsin(fr/2R)]\}$$

Ry: Theoretical value of surface roughness
P: Feed rate
R: Ball nose radius or corner radius

Ry: Theoretische Werte der Oberflächenqualität.
P: Vorschub
R: Kugelkopf- oder Radiusfräser

R \ Ry	Feed rate P · Vorschub									
	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
0.5	0.003	0.010	0.023	0.042	0.067	0.100				
1.0	0.001	0.005	0.011	0.020	0.032	0.046	0.063	0.083	0.107	
1.5	0.001	0.003	0.008	0.013	0.021	0.030	0.041	0.054	0.069	0.086
2.0	0.001	0.003	0.006	0.010	0.015	0.023	0.031	0.040	0.051	0.064
2.5	0.001	0.002	0.005	0.008	0.013	0.018	0.025	0.032	0.041	0.051
3.0		0.001	0.004	0.007	0.010	0.015	0.020	0.027	0.034	0.042
4.0		0.001	0.003	0.005	0.008	0.011	0.015	0.020	0.025	0.031
5.0		0.001	0.002	0.004	0.006	0.009	0.012	0.016	0.020	0.025
6.0			0.002	0.003	0.005	0.008	0.010	0.013	0.017	0.021
8.0			0.001	0.003	0.004	0.006	0.008	0.010	0.013	0.016
10.0			0.001	0.002	0.003	0.005	0.006	0.008	0.010	0.013
12.5			0.001	0.002	0.003	0.004	0.005	0.006	0.008	0.010

R \ Ry	Feed rate P · Vorschub									
	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0
0.5										
1.0										
1.5	0.104									
2.0	0.077	0.092	0.109							
2.5	0.061	0.073	0.086	0.100						
3.0	0.051	0.061	0.071	0.083	0.095	0.109				
4.0	0.038	0.045	0.053	0.062	0.071	0.081	0.091	0.103		
5.0	0.030	0.036	0.042	0.049	0.057	0.064	0.073	0.082	0.091	0.101
6.0	0.025	0.030	0.035	0.041	0.047	0.054	0.061	0.068	0.076	0.084
8.0	0.019	0.023	0.026	0.031	0.035	0.040	0.045	0.051	0.057	0.063
10.0	0.015	0.018	0.021	0.025	0.028	0.032	0.036	0.041	0.045	0.050
12.5	0.012	0.014	0.017	0.020	0.023	0.026	0.029	0.032	0.036	0.040

NOTIZEN:

Non-standard · Sonderwerkzeuge

Name: Fax: Tel: E-MAIL:	ZCC·CT Heltorfer Straße 12 40472 düsseldorf Germany Fax: +49-(0)211-989240-111 E-Mail:info@zccct-europe.com

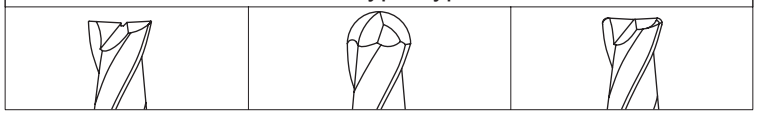
When the diameter or length of sample can't meet with your requirements, we will provide more specialized and precision non-standard making; Please fill the parameter, which you need, in the form.

Wenn die Standardabmessungen nicht reichen, bieten wir Ihnen Sonderausführungen nach Wunsch an. Bitte füllen Sie das entsprechende Formular aus.

Series	
GM	
HM	
NM	
AL	
SM	

Diameter Ø	Ø0.3～20.0mm
Edges Nr. Schneidenanzahl	

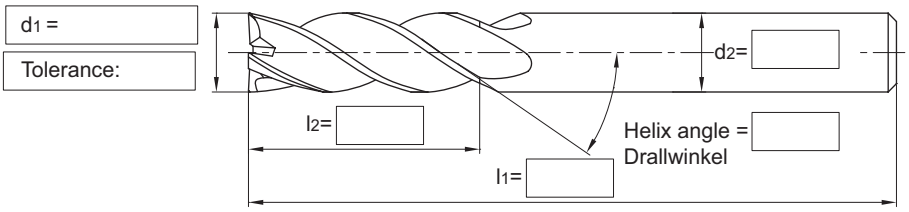
Typ · Type



☐ Flat end milling
Eckfräsen

☐ Ball end milling
Kugelfräsen

☐ Round arc milling
Radiuseckfräsen



Remarks:
Bemerkungen:

Order quantity: piece
Auftragsmenge: Stück

Expected delivery date:
Ewartetes Lieferdatum:

Date · Datum:

Confirmation · Unterschrift:

Non-standard · Sonderwerkzeuge

Name: Fax: Tel: E-MAIL:	ZCC·CT Heltorfer Straße 12 40472 düsseldorf Germany Fax: +49-(0)211-989240-111 E-Mail:info@zccct-europe.com

Work piece material · Werkstückstoff

- ☐ Carbon steel Kohlenstoffstahl
- ☐ Alloy steel legierter Stahl
- ☐ Prehardend steel vergüteter Stahl
- ☐ Harden steel gehärteter Stahl
- ☐ Stainless steel Rostfreier Stahl
- ☐ Grey cast iron GGG
- ☐ Nodular cast iron GGG
- ☐ Cooper alloy Kupferlegierung
- ☐ Alumium alloy / Alu leg.
- ☐ Titanium alloy Titanlegierung
- ☐ Heat resistance alloy/ Warmfeste leg.

Machined material trademark
Spezieller Werkstückstoff:

Tensile strength · Zugfestigkeit = N/mm²

Hardness= Härte (unit: (HRC,HB etc.))

Diameter Ø	Ø0.2～25.0mm
Edges Nr. Schneidenanzahl	
End edge over center: Schneide über Mitte	☐ Yes ☐ No

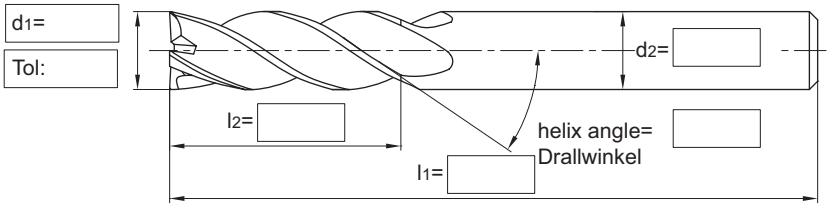
Cutter Information · Fräser Informationen

Typ · Type

- ☐ Flat end milling Eckfräsen
- ☐ Chamfer flat end milling Eckfräsen mit Fase
- ☐ Ball end milling Kugelfräsen
- ☐ Round arc milling Radiuseckfräsen

Machining method · Bearbeitungen

- ☐ Groove milling Nutenfräsen
- ☐ Side milling Eckfräsen
- ☐ Copy milling Formfräsen



Coating
Beschichtung
Yes ☐
No ☐

Holder Type
Aufnahmetyp

DIN6535
- ☐ Form HA
- ☐ Form HB

- ☐ Common straight holder Normal Rundschaft
- Special shape Spezial Ausführung

Remarks:
Bemerkungen:

Order quantity: piece
Auftragsmenge: Stück

Expected delivery date:
Ewartetes Lieferdatum:

Date · Datum:

Confirmation · Unterschrift:

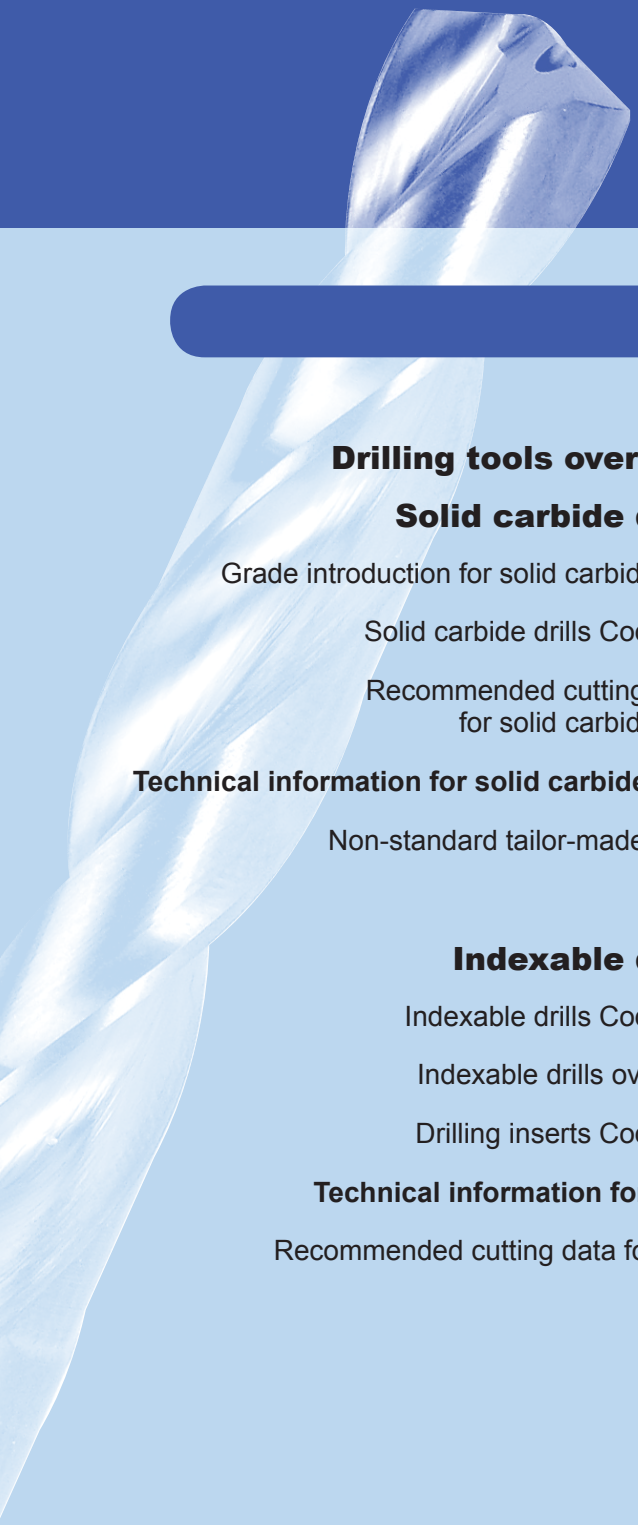




Bore machining tools
Bohrungswerkzeuge

• Drills	**C6-C105**	• Bohrer
Solid carbide drills	C6-C93	VHM Bohrer
Indexable drills	C95-C105	Wendeschneidplattenbohrer
• Reamers	**C106-C116**	• Reibahlen
Solid carbide reamers	C100-C111	VHM Reibahlen
• Threading tools	**C118-C128**	• Gewindewerkzeuge
Solid carbide threading tools	C118-C124	VHM Gewindebohrer
Solid carbide threading mills	C125	VHM Gewindefräser

NOTIZEN:



Drilling · Bohren

Drilling tools · Bohrwerkzeuge

Drilling tools overview	**C6**	**Bohrungswerkzeuge Übersicht**
Solid carbide drills	**C7-C93**	**VHM Bohrer**
Grade introduction for solid carbide drills	C7	Sortenbeschreibung für VHM Bohrer
Solid carbide drills Code Key	C8	ISO Kennzeichnung für VHM Bohrer
Recommended cutting datas for solid carbide drills	C69-C81	Empfohlene Schnittdaten für VHM Bohrer
Technical information for solid carbide drills	**C82-C87**	**Technische Information für VHM Bohrer**
Non-standard tailor-made guide	C89-C93	Bestellformular für Sonderwerkzeuge
Indexable drills	**C95-C105**	**Wendeschneidplattenbohrer**
Indexable drills Code Key	C95	ISO Kennzeich. von Wendeplattenbohrer
Indexable drills overview	C96-C97	Wendenplattenbohrer Übersicht
Drilling inserts Code Key	C98-C99	ISO Kennzeichnung für Bohrwendeplatten
Technical information for drills	**C103-C104**	**Technische Informationen für WSP-Bohrer**
Recommended cutting data for drills	C105	Empfohlene Schnittdaten für WSP-Bohrer

Drilling tools overview · Bohrer Übersicht

Machining Bearbeitung	Typ of drill Bohrertyp	Type · Typ	L/D	Shape of drills Bohrerausführung	Cooling mode Kühlmittel.	Ø	material · Material P		M	K	N	S	H	Page · Seite	
							Carbon steel Kohlenstoff Stahl	Alloy steel Legierter Stahl	Stainless steel · Rostfreier Stahl	Cast iron Grauguss	Non-ferrous metal Warmfeste Legier.	Heat resistant alloy Warmfeste Legier.	Hardened steel Gehärteter Stahl	Specification Spezifikation	Cutting data Schnittdaten
General machining Allgemeine Bearbeitung	Twist drill Spiralbohrer	**1534SU03**	**3xD**		External Extern	Ø2-Ø20	✓	✓	✓	✓	✓	✓		C7-39	C69-71
		1534SU03C	**3xD**		Internal Intern	Ø3-Ø20	✓	✓	✓	✓	✓	✓			
		1734SU03C	**3xD**		Internal Intern	Ø3-Ø20	✓	✓	✓	✓	✓	✓			
		1536SU05	**5xD**		External Extern	Ø2-Ø20	✓	✓	✓	✓	✓	✓			
		1536SU05C	**5xD**		Internal Intern	Ø3-Ø20	✓	✓	✓	✓	✓	✓			
		1736SU05C	**5xD**		Internal Intern	Ø3-Ø20	✓	✓	✓	✓	✓	✓			
		1538SU08C	**8xD**		Internal Intern	Ø3-Ø18	✓	✓	✓	✓	✓	✓			
	Step drill Stufenbohrer	**1557SU03**	**3xD**		External Extern	M4-M16	✓	✓	✓	✓	✓	✓		C40	C72
Carbon steel alloy steel Kohlenstoff Stahl Legierter Stahl	Twist drill Spiralbohrer	**1534ST03C**	**3xD**		Internal Intern	Ø3-Ø20	✓	✓	✓		✓	✓		C41-53	C73
		1536ST05C	**5xD**		Internal Intern	Ø3-Ø20	✓	✓	✓		✓	✓			
		1736ST05C	**5xD**		Internal Intern	Ø3-Ø20	✓	✓	✓		✓	✓			
high hardness steel Gehärteter Stahl	Twist drill Spiralbohrer	**1534SH03**	**3xD**		External Extern	Ø3-Ø16							✓	C54-55	C74
For aluminum, cast iron Für Aluminium, Gusseisen	Twist drill Spiralbohrer	**1105SC03**	**3xD**		External Extern	Ø2-Ø16				✓	✓			C56-59	C75
		1101SC05	**5xD**		External Extern	Ø2-Ø16				✓	✓				
	Three-lips drill Dreilippenb.	**1165PA03**	**3xD**		External Extern	Ø3-Ø20			✓	✓	✓	✓		C60-62	C76
	Three-lips drill Dreilippenb.	**1165PC03**	**3xD**		External Extern	Ø3-Ø20				✓				C63-65	C 77
	Straight flute drill gerade genuteter Bohrer	**1576PC05**			External Extern	Ø4-Ø20				✓	✓			C66-67	C78-79
		1579PC15C			Internal Intern	Ø5-Ø14				✓	✓				
	Centering drill Zentrierbohrer	**1143SC90**			External Extern	Ø5-Ø20				✓	✓			C68	C80
		1143SC120			External Extern	Ø5-Ø20				✓	✓				
Indexable drills series WSP-Bohrer	Indexable drills WSP-Bohrer	**ZD03**	**3xD**		Internal Intern	Ø16-Ø58	✓	✓	✓	✓	✓			C95-97	C99

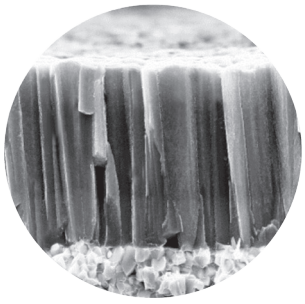
✓ = Very suitable · Sehr empfohlen
✓ = Suitable · Empfohlen

Grade introduction for solid carbide drills
Hartmetallsorten für VHM-Bohrer

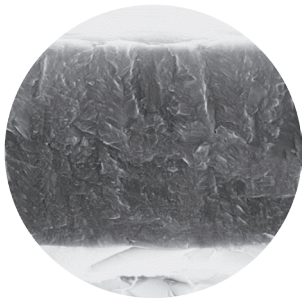
Coated Grade KDG303
Beschichtete Sorte

It is a combination of ultra-fine carbide substrate and Nano nc-TiAlN coating. It is a universal grade for machining of carbon steel, alloy steel (HRC<=48), cast iron and stainless steel. Suitable for the machining of Ni based high-temperature alloys at normal cutting speed.

Eine Kombination von Ultrafeinkorn-Hartmetall und Nano nc-TiAlN PVD-Beschichtung. Universelle Anwendung zur Bearbeitung von unlegiertem Stahl, legiertem Stahl (HRC<=48), Guss, rostfreiem Stahl und Ni-basierten, warmfesten Superlegierungen bei normaler Schnittgeschwindigkeit.

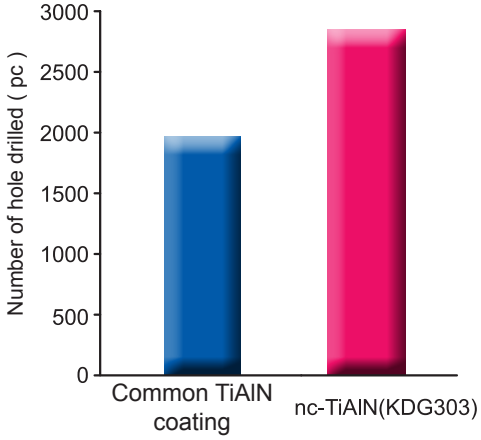


Common TiAlN coating
normale TiAlN Beschichtung



nc-TiAlN coating
nc-TiAlN Beschichtung

Application of nc-TiAlN coating in drilling Anwendungsbeispiel von nc-TiAlN	
Tool Type · Typ	1534SU03C-1200
Size · Durchmesser	Ø12mm
Workpiece material Werkstückstoff	42CrMo (32HRC)
Cutting speed Schnittgeschw.	100m/min
Rotating speed Umdreh. pro min	2652r/min
Feed rate per revolution Vorschub pro Umdrehung	0.25mm/r
Feed speed · Vorschub	663mm/min
Drilling depth · Bohrtiefe	36mm
Cooling system Kühlungssystem	Water-soluble liquid (Internal) Emulsion (Intern Zuführung)
Machine · Maschine	Mikron UCP 1000



Uncoated grades
Unbeschichtete Sorten

YK20F

It is an ultra-fine carbide grade with good wear resistance suitable for drilling and reaming of cast iron and nonferrous metals.

Ultrafeinkorn-Hartmetall mit guter Verschleiß-festigkeit.
Geeignet zum Bohren und Reiben von Guss und NE-Metallen.

YK30F

It is an ultra-fine carbide grade with good wear-resistance. A universal grade for drilling.

Ultrafeinkorn-Hartmetall mit guter Verschleißfestigkeit.
Universelle Sorte zum Bohren.

Solid carbide drills Code Key · ISO Kennzeichnung für VHM-Bohrer

Description Bezeichnung	
Code	Description · Beschreibung
1	DIN338
2	DIN1897
3	QJ/ZZQ(TO)01.001.002
4	DIN6537K
5	DIN6537K
6	DIN6537K
7	ZZC-C in QJ/ZZQ(TO)01.001.002
8	ZZC-D in QJ/ZZQ(TO)01.001.002
9	ZZC-E in QJ/ZZQ(TO)01.001.002

Application Anwendung	
Code	Description · Beschreibung
SU	Twist drill for general universal machining. Spiralbohrer für die allg. Bearbeitung
ST	Twist drill for soft steel, stainless steel Spiralbohrer für weiche Stähle und rostfr. Stahl
SH	Twist drill for high hardness steel Spiralbohrer für gehärteten Stahl
SC	Twist drill for aluminum, cast iron Spiralbohrer für Alu. und Grauguss
PA	Three-lips drill for aluminum, cast iron 3-Lippenbohrer für Alu leg., Grauguss
PC	Straight flute drill for aluminum, cast iron gerade genuteter Bohrer für Alu, Grauguss

Type of tools Werkzeugtyp	
Code	Description · Beschreibung
1	Drills · Bohrer

Mode of cooling Art der Kühlung	
Code	Description · Beschreibung
C	Internal Coolant Innere Kühlmittelzufuhr

1 7 3 6 SU 05 C -0850

Type of shank · Schaftausführung	
Code	Description · Beschreibung
1	Straight shank Zylinder Schaftausführung
2	Square head Straight shank DIN 10 4- Kant Schaft DIN 10
3	Double flattened Straight shank DIN1809 2-Flächen Zylinderschaft DIN1809
5	Straight shank DIN6535HA Zylinderschaft DIN6535HA
7	Whistle notch shank DIN6535HE Whistle notch Schaft DIN6535HE
9	Tapered shank MK-Schaft

Type of drill · Bohrertyp	
Code	Description · Beschreibung
0	Twist drill Spiralbohrer
3	Multiple functions twist drill Universalspiralbohrer
4	Centering drill Zentrierbohrer
5	Step drill Stufenbohrer
6	Three-lips drill 3-Schneidenbohrer
7	Straight flute drill Bohrer mit geraden Nuten

Specification · Bezeichnung	
Code	Description · Beschreibung
0850	Nominal cutting diameter of stepless drill Bohrerdurchmesser: 8,5mm
M6	Step drill for standard pitch Gewindebohrer Standardsteigungen
M8×1	Step drill for fine pitch Gewindebohrer mit Feingewinde

Identification of drilling depth and point angle · max. Bohrtiefe			
If the tool is not a centering drill, it indicate the drilling depth Ist das Werkzeug kein Zentrierbohr. wird die Bohrtiefe angegeben.		If the tool is a centering drill, it indicate the point angle Ist das Werkzeug kein Zentrierbohr. wird der Spitzenwinkel angegeben.	
Code	Description · Beschreibung	Code	Description · Beschreibung
03	(2~3) d	**90**	Centering drill with 90° point angle NC-Anbohrer mit 90° Winkel
05	(4~5) d		
08	(7~8) d	**120**	Centering drill with 120° point angle NC-Anbohrer mit 120° Winkel
15	(15) d		

SU series twist drill · Spiralbohrer Serie

General machining
Allgemeine Bearbeitung

SU Universal series · Universalausführung

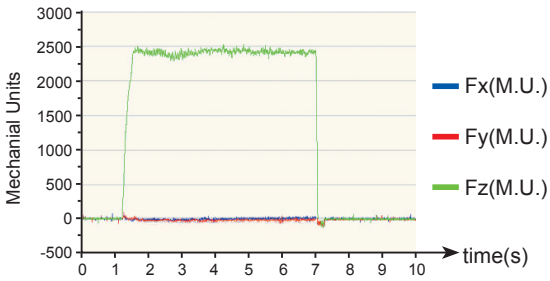
The optimized chip-breaker, shape of the cutting edge and a proper change of the rake angle combined with a TiAlN nano coating for a wider application field. It is for the drilling of work piece materials of P(steel), M (stainless steel) and K(cast iron) with high performance.

Eine optimierte Schneidengeometrie in Verbindung mit einer Nano TiAlN-Beschichtung ermöglicht eine Hochleistungsbearbeitung beim Bohren in allgemeinen Stahlwerkstoffen, rostfreien Werkstoffen und Guss.



Specially designed drill point makes cutting smooth.

Spezielle Geometrie für weichen Schnitt



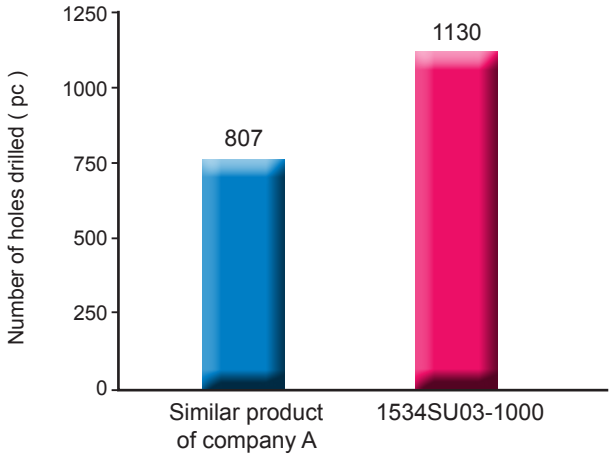
Cutting force chart of SU series

Diameter of drill · Bohrer:: Ø 12 mm
Work piece material · Werkstoff: 40Cr
Hardness · Härte : HB280
Cutting speed · Schnittgeschwindig.: 90m/min
Feed rate · Vorschub: 715mm/min
Depth of drilling · Bohrtiefe: 40 mm
Cooling system: Emulsion (Internal) cooling
Kühlung: innere Kühlmittel zufuhr



SU series twist drills comparison with company A's similar product
Anwendungsbeispiel der SU Serie Spiralbohrer mit vergleichbarem Produkt

Tool Type · Typ: 1534SU03-1000
Size · Durchmesser: Ø10mm
Workpiece material ·Werkstückstoff: 42CrMo(35HRC)
Cutting speed· Schnittgeschw.: 100m/min
Rotating speed · Umdreh. pro min: 3200r/min
Feed rate per revolution
Vorschub pro Umdrehung: 0.20mm/r
Feed speed · Vorschub: 640mm/min
Drilling depth · Bohrtiefe: 30mm(L/D=3)
Cooling system · Kühlsystem:
water soluble liquid (External) Emulsion (Extern)
Machine · Maschine: Mikron UCP 1000



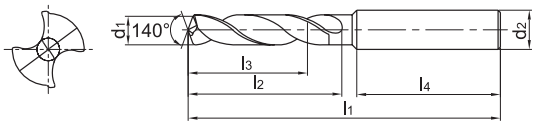
SU series · SU Serie

General machining · Allgemeine Bearbeitung



External Coolant
Externe Kühlung

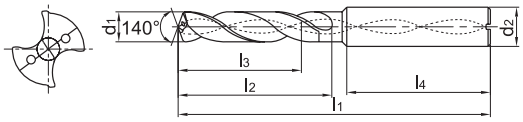
Straight shank
Zylinderschaft





Internal Coolant
Interne Kühlung

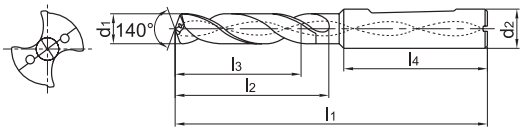
Straight shank
Zylinderschaft





Internal Coolant
Interne Kühlung

Whistle notch
shank · Schaft



- For high efficient drilling of P(steel), M (stainless steel) and K(cast iron) with high performance.
- Waveform cutting edges achieve outstanding sharpness and strength, promoting chip removal.
- Hocheffizientes Bohren von allgemeinen Stahlwerkstoffen, rostfreien Werkstoffen und Guss.
- Wellenförmige Schneidkante mit hoher Schneidenschärfe, Stabilität und guter Spanabfuhr.

Drill diameter Bohrer Ø $d_1(m_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen					Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	Shank length Schaftlänge	
					$d_2(h_6)$	l_1	l_2	l_3	l_4	KDG303
2.0	3	External Extern	Straight shank Zylinder-schaft	**1534SU03-0200**	6	62	20	14	36	●
	5			**1536SU05-0200**	6	66	28	23	36	●
2.1	3			**1534SU03-0210**	6	62	20	14	36	●
	5			**1536SU05-0210**	6	66	28	23	36	●
2.2	3			**1534SU03-0220**	6	62	20	14	36	●
	5			**1536SU05-0220**	6	66	28	23	36	●
2.3	3			**1534SU03-0230**	6	62	20	14	36	●
	5			**1536SU05-0230**	6	66	28	23	36	●
2.4	3			**1534SU03-0240**	6	62	20	14	36	●
	5			**1536SU05-0240**	6	66	28	23	36	●
2.5	3			**1534SU03-0250**	6	62	20	14	36	●
	5			**1536SU05-0250**	6	66	28	23	36	●
2.6	3			**1534SU03-0260**	6	62	20	14	36	●
	5			**1536SU05-0260**	6	66	28	23	36	●
2.7	3			**1534SU03-0270**	6	62	20	14	36	●
	5			**1536SU05-0270**	6	66	28	23	36	●
2.8	3			**1534SU03-0280**	6	62	20	14	36	●
	5			**1536SU05-0280**	6	66	28	23	36	●
2.9	3			**1534SU03-0290**	6	62	20	14	36	●
	5			**1536SU05-0290**	6	66	28	23	36	●
3.0	3			**1534SU03-0300**	6	62	20	14	36	●
	5			**1536SU05-0300**	6	66	28	23	36	●
	3	Internal Intern		**1534SU03C-0300**	6	62	20	14	36	●
	5			**1536SU05C-0300**	6	66	28	23	36	●
	3		Whistle notch shank Schaft	**1734SU03C-0300**	6	62	20	14	36	●
	5			**1736SU05C-0300**	6	66	28	23	36	●
	8		Straight	**1538SU08C-0300**	6	72	34	29	36	●

 ● ex Stock Lager ○ on demand · auf Anfrage

Drill diameter Bohrer Ø $d_1(m_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen					Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	Shank length Schaftlänge	
					$d_2(h_6)$	l_1	l_2	l_3	l_4	KDG303
3.1	3	External Extern	Straight shank	1534SU03-0310	6	62	20	14	36	●
	5			1536SU05-0310	6	66	28	23	36	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-0310	6	62	20	14	36	●
	5			1536SU05C-0310	6	66	28	23	36	●
	3		Whistle notch shank Schaft	1734SU03C-0310	6	62	20	14	36	●
	5			1736SU05C-0310	6	66	28	23	36	●
	8		Straight shank	1538SU08C-0310	6	72	34	29	36	●
3.2	3	External Extern		1534SU03-0320	6	62	20	14	36	●
	5		Zylinder-schaft	1536SU05-0320	6	66	28	23	36	●
	3	Internal Intern		1534SU03C-0320	6	62	20	14	36	●
	5			1536SU05C-0320	6	66	28	23	36	●
	3		Whistle notch shank Schaft	1734SU03C-0320	6	62	20	14	36	●
	5			1736SU05C-0320	6	66	28	23	36	●
	8		Straight shank	1538SU08C-0320	6	72	34	29	36	●
3.25	3	External Extern		1534SU03-0325	6	62	20	14	36	●
	5		Zylinder-schaft	1536SU05-0325	6	66	28	23	36	●
	3	Internal Intern		1534SU03C-0325	6	62	20	14	36	●
	5			1536SU05C-0325	6	66	28	23	36	●
	3		Whistle notch shank Schaft	1734SU03C-0325	6	62	20	14	36	●
	5			1736SU05C-0325	6	66	28	23	36	●
3.3	3	External Extern	Straight shank	1534SU03-0330	6	62	20	14	36	●
	5			1536SU05-0330	6	66	28	23	36	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-0330	6	62	20	14	36	●
	5			1536SU05C-0330	6	66	28	23	36	●
	3		Whistle notch shank Schaft	1734SU03C-0330	6	62	20	14	36	●
	5			1736SU05C-0330	6	66	28	23	36	●
	8		Straight shank	1538SU08C-0330	6	72	34	29	36	●
3.4	3	External Extern		1534SU03-0340	6	62	20	14	36	●
	5		Zylinder-schaft	1536SU05-0340	6	66	28	23	36	●
	3	Internal Intern		1534SU03C-0340	6	62	20	14	36	●
	5			1536SU05C-0340	6	66	28	23	36	●
	3		Whistle notch shank Schaft	1734SU03C-0340	6	62	20	14	36	●
	5			1736SU05C-0340	6	66	28	23	36	●
	8		Straight shank	1538SU08C-0340	6	72	34	29	36	●

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

Grade Sorte	Workpiece material · Werkstückstoff										
	Mild steel Baustahl HB≤180	Carbon steel Kohlenstoff. Stahl	Hardened steel · gehärteter Stahl			Stainless steel Rostfreier Stahl	Cast iron, Grauguss	Nodular cast iron GGG	Aluminum alloy Alu leg.	Copper alloy Kupfer leg.	Heat resist. alloy warmfest. leg.
			~40HRC	~50HRC	~60HRC						
KDG303	✔	✔	✔			✔	✔	✔	✔		✔

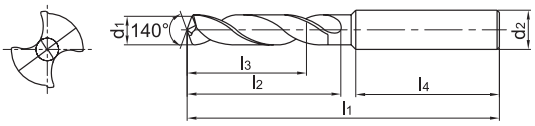
Code key C 8
ISO Kennzeichen
Cutting data 69-81
Schnittdaten
Technical Information C82-87
Technische Information
Non-standart tailor made C 89-93
Bestellformular für Sonderwerkzeuge

SU series · SU Serie

General machining · Allgemeine Bearbeitung

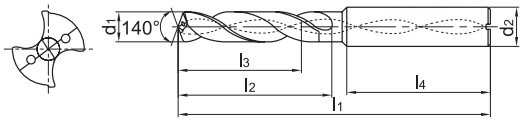

External Coolant
Externe Kühlung

Straight shank
Zylinderschaft



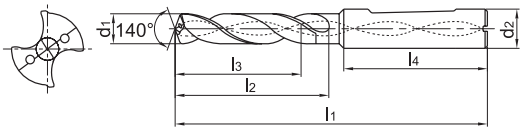

Internal Coolant
Interne Kühlung

Straight shank
Zylinderschaft




Internal Coolant
Interne Kühlung

Whistle notch
shank · Schaft



- For high efficient drilling of P(steel), M (stainless steel) and K(cast iron) with high performance.
- Waveform cutting edges achieve outstanding sharpness and strength, promoting chip removal.
- Hocheffizientes Bohren von allgemeinen Stahlwerkstoffen, rostfreien Werkstoffen und Guss.
- Wellenförmige Schneidkante mit hoher Schneidenschärfe, Stabilität und guter Spanabfuhr.

Drill diameter Bohrer Ø $d_1(m_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen					Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	Shank length Schaftlänge	
					$d_2(h_6)$	l_1	l_2	l_3	l_4	KDG303
3.5	3	External Extern	Straight shank Zylinder-schaft	**1534SU03-0350**	6	62	20	14	36	●
	5			**1536SU05-0350**	6	66	28	23	36	●
	3	Internal Intern		**1534SU03C-0350**	6	62	20	14	36	●
	5			**1536SU05C-0350**	6	66	28	23	36	●
	3		Whistle notch shank Schaft	**1734SU03C-0350**	6	62	20	14	36	●
	5			**1736SU05C-0350**	6	66	28	23	36	●
	8			**1538SU08C-0350**	6	72	34	29	36	●
3.6	3	External Extern	Straight shank Zylinder-schaft	**1534SU03-0360**	6	62	20	14	36	●
	5			**1536SU05-0360**	6	66	28	23	36	●
	3	Internal Intern		**1534SU03C-0360**	6	62	20	14	36	●
	5			**1536SU05C-0360**	6	66	28	23	36	●
	3		Whistle notch shank	**1734SU03C-0360**	6	62	20	14	36	●
	5			**1736SU05C-0360**	6	66	28	23	36	●
	8			**1538SU08C-0360**	6	72	34	29	36	●
3.7	3	External Extern	Straight shank Zylinder-schaft	**1534SU03-0370**	6	62	20	14	36	●
	5			**1536SU05-0370**	6	66	28	23	36	●
	3	Internal Intern		**1534SU03C-0370**	6	62	20	14	36	●
	5			**1536SU05C-0370**	6	66	28	23	36	●
	3		Whistle notch shank	**1734SU03C-0370**	6	62	20	14	36	●
	5			**1736SU05C-0370**	6	66	28	23	36	●
	8			**1538SU08C-0370**	6	72	34	29	36	●
3.8	3	External Extern	Straight shank Zylinder-schaft	**1534SU03-0380**	6	66	24	17	36	●
	5			**1536SU05-0380**	6	74	36	29	36	●
	3	Internal Intern		**1534SU03C-0380**	6	66	24	17	36	●
	5			**1536SU05C-0380**	6	74	36	29	36	●
	3		Whistle notch shank	**1734SU03C-0380**	6	66	24	17	36	●
	5			**1736SU05C-0380**	6	74	36	29	36	●
	8		Straight	**1538SU08C-0380**	6	81	43	36	36	●

Drill diameter Bohrer Ø $d_1(m_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen					Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	Shank length Schaftlänge	
					$d_2(h_6)$	l_1	l_2	l_3	l_4	KDG303
	3	External Extern	Straight shank	1534SU03-0390	6	66	24	17	36	●
	5			1536SU05-0390	6	74	36	29	36	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-0390	6	66	24	17	36	●
3.9	5			1536SU05C-0390	6	74	36	29	36	●
	3		Whistle notch shank Schaft	1734SU03C-0390	6	66	24	17	36	●
	5			1736SU05C-0390	6	74	36	29	36	●
	8			1538SU08C-0390	6	81	43	36	36	●
	3	External Extern	Straight shank	1534SU03-0400	6	66	24	17	36	●
	5			1536SU05-0400	6	74	36	29	36	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-0400	6	66	24	17	36	●
4.0	5			1536SU05C-0400	6	74	36	29	36	●
	3		Whistle notch shank Schaft	1734SU03C-0400	6	66	24	17	36	●
	5			1736SU05C-0400	6	74	36	29	36	●
	8			1538SU08C-0400	6	81	43	36	36	●
	3	External Extern	Straight shank	1534SU03-0410	6	66	24	17	36	●
	5			1536SU05-0410	6	74	36	29	36	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-0410	6	66	24	17	36	●
4.1	5			1536SU05C-0410	6	74	36	29	36	●
	3		Whistle notch shank Schaft	1734SU03C-0410	6	66	24	17	36	●
	5			1736SU05C-0410	6	74	36	29	36	●
	8			1538SU08C-0410	6	81	43	36	36	●
	3	External Extern	Straight shank	1534SU03-0420	6	66	24	17	36	●
	5			1536SU05-0420	6	74	36	29	36	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-0420	6	66	24	17	36	●
4.2	5			1536SU05C-0420	6	74	36	29	36	●
	3		Whistle notch shank Schaft	1734SU03C-0420	6	66	24	17	36	●
	5			1736SU05C-0420	6	74	36	29	36	●
	8			1538SU08C-0420	6	81	43	36	36	●
	3	External Extern	Straight shank	1534SU03-0430	6	66	24	17	36	●
	5			1536SU05-0430	6	74	36	29	36	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-0430	6	66	24	17	36	●
4.3	5			1536SU05C-0430	6	74	36	29	36	●
	3		Whistle notch shank Schaft	1734SU03C-0430	6	66	24	17	36	●
	5			1736SU05C-0430	6	74	36	29	36	●
	8		Straight shank Zylinders.	1538SU08C-0430	6	81	43	36	36	●

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

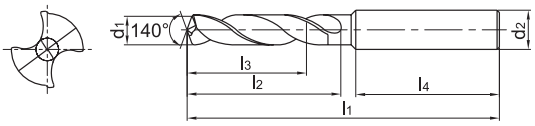
Grade Sorte	Workpiece material · Werkstückstoff										
	Mild steel Baustahl HB≤180	Carbon steel, Alloy steel	Hardened steel · gehärteter Stahl			Stainless steel Rostfreier Stahl	Cast iron Gusseisen	Nodular cast iron GGG	Aluminum alloy Alu-leg.	Copper alloy Kupfer leg.	Heat resist. alloy warmfest. leg.
			~40HRC	~50HRC	~60HRC						
KDG303	✔	✔	✔			✔	✔	✔	✔		✔

Code key C 8
ISO Kennzeichen
Cutting data 69-81
Schnittdaten
Technical Information C82-87
Technische Information
Non-standart tailor made C 89-93
Bestellformular für Sonderwerkzeuge

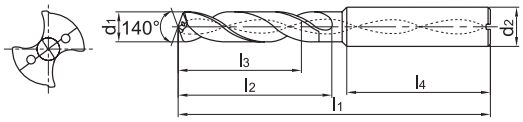
SU series · SU Serie

General machining · Allgemeine Bearbeitung

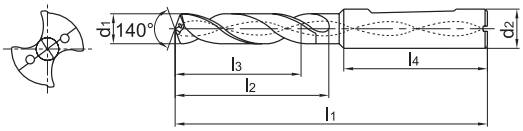

External Coolant
Externe Kühlung
Straight shank
Zylinderschaft




Internal Coolant
Interne Kühlung
Straight shank
Zylinderschaft




Internal Coolant
Interne Kühlung
Whistle notch
shank · Schaft



- For high efficient drilling of P(steel), M (stainless steel) and K(cast iron) with high performance.
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Drill diameter Bohrer Ø $d_1(m_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen					Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	Shank length Schaftlänge	
					$d_2(h_6)$	l_1	l_2	l_3	l_4	KDG303
4.4	3	External Extern	Straight shank	1534SU03-0440	6	66	24	17	36	●
	5			1536SU05-0440	6	74	36	29	36	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-0440	6	66	24	17	36	●
	5			1536SU05C-0440	6	74	36	29	36	●
	3		Whistle notch shank	1734SU03C-0440	6	66	24	17	36	●
	5			1736SU05C-0440	6	74	36	29	36	●
	8			1538SU08C-0440	6	81	43	36	36	●
4.5	3	External Extern	Straight shank	1534SU03-0450	6	66	24	17	36	●
	5			1536SU05-0450	6	74	36	29	36	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-0450	6	66	24	17	36	●
	5			1536SU05C-0450	6	74	36	29	36	●
	3		Whistle notch shank	1734SU03C-0450	6	66	24	17	36	●
	5			1736SU05C-0450	6	74	36	29	36	●
	8			1538SU08C-0450	6	81	43	36	36	●
4.6	3	External Extern	Straight shank	1534SU03-0460	6	66	24	17	36	●
	5			1536SU05-0460	6	74	36	29	36	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-0460	6	66	24	17	36	●
	5			1536SU05C-0460	6	74	36	29	36	●
	3		Whistle notch shank	1734SU03C-0460	6	66	24	17	36	●
	5			1736SU05C-0460	6	74	36	29	36	●
	8			1538SU08C-0460	6	81	43	36	36	●
4.65	3	External Extern	Straight shank	1534SU03-0465	6	66	24	17	36	●
	5			1536SU05-0465	6	74	36	29	36	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-0465	6	66	24	17	36	●
	5			1536SU05C-0465	6	74	36	29	36	●
	3		Whistle notch shank	1734SU03C-0465	6	66	24	17	36	●
	5			1736SU05C-0465	6	74	36	29	36	●

 ● ex Stock Lager ○ on demand · auf Anfrage

Drill diameter Bohrer Ø $d_1(m_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen					Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	Shank length Schaftlänge	
					$d_2(h_6)$	l_1	l_2	l_3	l_4	KDG303
4.7	3	External Extern	Straight shank	1534SU03-0470	6	66	24	17	36	●
	5		Zylinder-schaft	1536SU05-0470	6	74	36	29	36	●
	3	Internal Intern		1534SU03C-0470	6	66	24	17	36	●
	5			1536SU05C-0470	6	74	36	29	36	●
	3		Whistle notch shank Schaft	1734SU03C-0470	6	66	24	17	36	●
	5			1736SU05C-0470	6	74	36	29	36	●
	8			1538SU08C-0470	6	81	43	36	36	●
4.8	3	External Extern	Straight shank	1534SU03-0480	6	66	28	20	36	●
	5		Zylinder-schaft	1536SU05-0480	6	82	44	35	36	●
	3	Internal Intern		1534SU03C-0480	6	66	28	20	36	●
	5			1536SU05C-0480	6	82	44	35	36	●
	3		Whistle notch shank Schaft	1734SU03C-0480	6	66	28	20	36	●
	5			1736SU05C-0480	6	82	44	35	36	●
	8			1538SU08C-0480	6	95	57	48	36	●
4.9	3	External Extern	Straight shank	1534SU03-0490	6	66	28	20	36	●
	5		Zylinder-schaft	1536SU05-0490	6	82	44	35	36	●
	3	Internal Intern		1534SU03C-0490	6	66	28	20	36	●
	5			1536SU05C-0490	6	82	44	35	36	●
	3		Whistle notch shank Schaft	1734SU03C-0490	6	66	28	20	36	●
	5			1736SU05C-0490	6	82	44	35	36	●
	8			1538SU08C-0490	6	95	57	48	36	●
5.0	3	External Extern	Straight shank	1534SU03-0500	6	66	28	20	36	●
	5		Zylinder-schaft	1536SU05-0500	6	82	44	35	36	●
	3	Internal Intern		1534SU03C-0500	6	66	28	20	36	●
	5			1536SU05C-0500	6	82	44	35	36	●
	3		Whistle notch shank Schaft	1734SU03C-0500	6	66	28	20	36	●
	5			1736SU05C-0500	6	82	44	35	36	●
	8			1538SU08C-0500	6	95	57	48	36	●
5.1	3	External Extern	Straight shank	1534SU03-0510	6	66	28	20	36	●
	5		Zylinder-schaft	1536SU05-0510	6	82	44	35	36	●
	3	Internal Intern		1534SU03C-0510	6	66	28	20	36	●
	5			1536SU05C-0510	6	82	44	35	36	●
	3		Whistle notch shank Schaft	1734SU03C-0510	6	66	28	20	36	●
	5			1736SU05C-0510	6	82	44	35	36	●
	8		Straight shank Zylinders.	1538SU08C-0510	6	95	57	48	36	●

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

Grade Sorte	Workpiece material · Werkstückstoff										
	Mild steel Baustahl HB≤180	Carbon steel, Alloy steel	Hardened steel · gehärteter Stahl			Stainless steel Rostfreier Stahl	Cast iron Gusseisen	Nodular cast iron GGG	Aluminum alloy Alu leg.	Copper alloy Kupfer leg.	Heat resist. alloy warmfest. leg.
			~40HRC	~50HRC	~60HRC						
KDG303	✔	✔	✔			✔	✔	✔	✔		✔

Code key C 8
ISO Kennzeichen
Cutting data 69-81
Schnittdaten
Technical Information C82-87
Technische Information
Non-standart tailor made C 89-93
Bestellformular für Sonderwerkzeuge

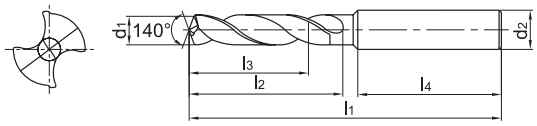
SU series · SU Serie

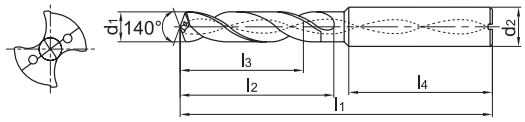
General machining · Allgemeine Bearbeitung

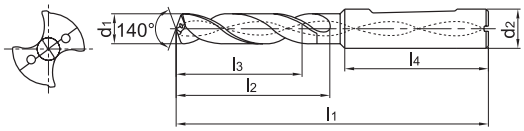

External Coolant
Externe Kühlung
Straight shank
Zylinderschaft


Internal Coolant
Interne Kühlung
Straight shank
Zylinderschaft


Internal Coolant
Interne Kühlung
Whistle notch
shank · Schaft







- For high efficient drilling of P(steel), M (stainless steel) and K(cast iron) with high performance.
- Waveform cutting edges achieve outstanding sharpness and strength, promoting chip removal.
- Hocheffizientes Bohren von allgemeinen Stahlwerkstoffen, rostfreien Werkstoffen und Guss.
- Wellenförmige Schneidkante mit hoher Schneidenschärfe, Stabilität und guter Spanabfuhr.

Drill diameter Bohrer Ø $d_1(m_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen					Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	Shank length Schaftlänge	
					$d_2(h_6)$	l_1	l_2	l_3	l_4	KDG303
5.2	3	External Extern	Straight shank	1534SU03-0520	6	66	28	20	36	●
	5			1536SU05-0520	6	82	44	35	36	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-0520	6	66	28	20	36	●
	5			1536SU05C-0520	6	82	44	35	36	●
	3		Whistle notch shank Schaft	1734SU03C-0520	6	66	28	20	36	●
	5			1736SU05C-0520	6	82	44	35	36	●
	8			1538SU08C-0520	6	95	57	48	36	●
5.3	3	External Extern	Straight shank	1534SU03-0530	6	66	28	20	36	●
	5			1536SU05-0530	6	82	44	35	36	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-0530	6	66	28	20	36	●
	5			1536SU05C-0530	6	82	44	35	36	●
	3		Whistle notch shank Schaft	1734SU03C-0530	6	66	28	20	36	●
	5			1736SU05C-0530	6	82	44	35	36	●
	8			1538SU08C-0530	6	95	57	48	36	●
5.4	3	External Extern	Straight shank	1534SU03-0540	6	66	28	20	36	●
	5			1536SU05-0540	6	82	44	35	36	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-0540	6	66	28	20	36	●
	5			1536SU05C-0540	6	82	44	35	36	●
	3		Whistle notch shank Schaft	1734SU03C-0540	6	66	28	20	36	●
	5			1736SU05C-0540	6	82	44	35	36	●
	8			1538SU08C-0540	6	95	57	48	36	●
5.5	3	External Extern	Straight shank	1534SU03-0550	6	66	28	20	36	●
	5			1536SU05-0550	6	82	44	35	36	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-0550	6	66	28	20	36	●
	5			1536SU05C-0550	6	82	44	35	36	●
	3		Whistle notch shank Schaft	1734SU03C-0550	6	66	28	20	36	●
	5			1736SU05C-0550	6	82	44	35	36	●
	8		Straight	1538SU08C-0550	6	95	57	48	36	●

Drill diameter Bohrer Ø $d_1(m_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen					Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	Shank length Schaftlänge	
					$d_2(h_6)$	l_1	l_2	l_3	l_4	KDG303
5.55	3	External Extern	Straight shank Zylinder-schaft	1534SU03-0555	6	66	28	20	36	●
	5			1536SU05-0555	6	82	44	35	36	●
	3	Internal Intern		1534SU03C-0555	6	66	28	20	36	●
	5			1536SU05C-0555	6	82	44	35	36	●
	3		Whistle notch shank Schaft	1734SU03C-0555	6	66	28	20	36	●
	5			1736SU05C-0555	6	82	44	35	36	●
5.6	3	External Extern	Straight shank Zylinder-schaft	1534SU03-0560	6	66	28	20	36	●
	5			1536SU05-0560	6	82	44	35	36	●
	3	Internal Intern		1534SU03C-0560	6	66	28	20	36	●
	5			1536SU05C-0560	6	82	44	35	36	●
	3		Whistle notch shank Schaft	1734SU03C-0560	6	66	28	20	36	●
	5			1736SU05C-0560	6	82	44	35	36	●
	8			1538SU08C-0560	6	95	57	48	36	●
5.7	3	External Extern	Straight shank Zylinder-schaft	1534SU03-0570	6	66	28	20	36	●
	5			1536SU05-0570	6	82	44	35	36	●
	3	Internal Intern		1534SU03C-0570	6	66	28	20	36	●
	5			1536SU05C-0570	6	82	44	35	36	●
	3		Whistle notch shank Schaft	1734SU03C-0570	6	66	28	20	36	●
	5			1736SU05C-0570	6	82	44	35	36	●
	8			1538SU08C-0570	6	95	57	48	36	●
5.8	3	External Extern	Straight shank Zylinder-schaft	1534SU03-0580	6	66	28	20	36	●
	5			1536SU05-0580	6	82	44	35	36	●
	3	Internal Intern		1534SU03C-0580	6	66	28	20	36	●
	5			1536SU05C-0580	6	82	44	35	36	●
	3		Whistle notch shank Schaft	1734SU03C-0580	6	66	28	20	36	●
	5			1736SU05C-0580	6	82	44	35	36	●
	8			1538SU08C-0580	6	95	57	48	36	●
5.9	3	External Extern	Straight shank Zylinder-schaft	1534SU03-0590	6	66	28	20	36	●
	5			1536SU05-0590	6	82	44	35	36	●
	3	Internal Intern		1534SU03C-0590	6	66	28	20	36	●
	5			1536SU05C-0590	6	82	44	35	36	●
	3		Whistle notch shank Schaft	1734SU03C-0590	6	66	28	20	36	●
	5			1736SU05C-0590	6	82	44	35	36	●
	8		Straight shank Zylinders.	1538SU08C-0590	6	95	57	48	36	●

Material Overview · Material Übersicht

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Grade Sorte	Workpiece material · Werkstückstoff										
	Mild steel Baustahl HB≤180	Carbon steel, Alloy steel	Hardened steel · gehärteter Stahl			Stainless steel Rostfreier Stahl	Cast iron Gusseisen	Nodular cast iron GGG	Aluminum alloy Alu leg.	Copper alloy Kupfer leg.	Heat resist. alloy warmfest. leg.
			~40HRC	~50HRC	~60HRC						
KDG303	✔	✔	✔			✔	✔	✔	✔		✔

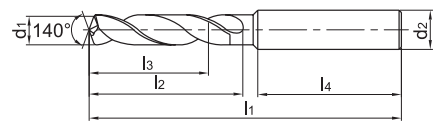
Code key C 8
ISO Kennzeichen
Cutting data 69-81
Schnittdaten
Technical Information C82-87
Technische Information
Non-standart tailor made C 89-93
Bestellformular für Sonderwerkzeuge

SU series · SU Serie

General machining · Allgemeine Bearbeitung

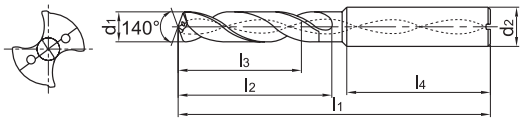

External Coolant
Externe Kühlung

Straight shank
Zylinderschaft



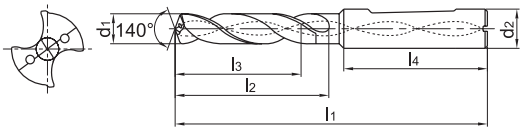

Internal Coolant
Interne Kühlung

Straight shank
Zylinderschaft




Internal Coolant
Interne Kühlung

Whistle notch
shank · Schaft



- For high efficient drilling of P(steel), M (stainless steel) and K(cast iron) with high performance.
- Waveform cutting edges achieve outstanding sharpness and strength, promoting chip removal.
- Hocheffizientes Bohren von allgemeinen Stahlwerkstoffen, rostfreien Werkstoffen und Guss.
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Drill diameter Bohrer Ø $d_1(m_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen					Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	Shank length Schaftlänge	
					$d_2(h_6)$	l_1	l_2	l_3	l_4	KDG303
6.0	3	External Extern	Straight shank Zylinderschaft	**1534SU03-0600**	6	66	28	20	36	●
	5			**1536SU05-0600**	6	82	44	35	36	●
	3	Internal Intern		**1534SU03C-0600**	6	66	28	20	36	●
	5			**1536SU05C-0600**	6	82	44	35	36	●
	3		Whistle notch shank	**1734SU03C-0600**	6	66	28	20	36	●
	5			**1736SU05C-0600**	6	82	44	35	36	●
	8		Straight shank Zylinderschaft	**1538SU08C-0600**	6	95	57	48	36	●
6.1	3	External Extern		**1534SU03-0610**	8	79	34	24	36	●
	5			**1536SU05-0610**	8	91	53	43	36	●
	3	Internal Intern		**1534SU03C-0610**	8	79	34	24	36	●
	5			**1536SU05C-0610**	8	91	53	43	36	●
	3		Whistle notch shank	**1734SU03C-0610**	8	79	34	24	36	●
	5			**1736SU05C-0610**	8	91	53	43	36	●
	8		Straight shank Zylinderschaft	**1538SU08C-0610**	8	114	76	66	36	●
6.2	3	External Extern		**1534SU03-0620**	8	79	34	24	36	●
	5			**1536SU05-0620**	8	91	53	43	36	●
	3	Internal Intern		**1534SU03C-0620**	8	79	34	24	36	●
	5			**1536SU05C-0620**	8	91	53	43	36	●
	3		Whistle notch shank	**1734SU03C-0620**	8	79	34	24	36	●
	5			**1736SU05C-0620**	8	91	53	43	36	●
	8		Straight shank Zylinderschaft	**1538SU08C-0620**	8	114	76	66	36	●
6.3	3	External Extern		**1534SU03-0630**	8	79	34	24	36	●
	5			**1536SU05-0630**	8	91	53	43	36	●
	3	Internal Intern		**1534SU03C-0630**	8	79	34	24	36	●
	5			**1536SU05C-0630**	8	91	53	43	36	●
	3		Whistle notch shank	**1734SU03C-0630**	8	79	34	24	36	●
	5			**1736SU05C-0630**	8	91	53	43	36	●
	8		Straight shank	**1538SU08C-0630**	8	114	76	66	36	●

Drill diameter Bohrer Ø $d_1(m_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen					Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	Shank length Schaftlänge	
					$d_2(h_6)$	l_1	l_2	l_3	l_4	KDG303
6.4	3	External Extern	Straight shank	1534SU03-0640	8	79	34	24	36	●
	5			1536SU05-0640	8	91	53	43	36	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-0640	8	79	34	24	36	●
	5			1536SU05C-0640	8	91	53	43	36	●
	3		Whistle notch shank Schaft	1734SU03C-0640	8	79	34	24	36	●
	5			1736SU05C-0640	8	91	53	43	36	●
	8			1538SU08C-0640	8	114	76	66	36	●
6.5	3	External Extern	Straight shank	1534SU03-0650	8	79	34	24	36	●
	5			1536SU05-0650	8	91	53	43	36	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-0650	8	79	34	24	36	●
	5			1536SU05C-0650	8	91	53	43	36	●
	3		Whistle notch shank Schaft	1734SU03C-0650	8	79	34	24	36	●
	5			1736SU05C-0650	8	91	53	43	36	●
	8			1538SU08C-0650	8	114	76	66	36	●
6.6	3	External Extern	Straight shank	1534SU03-0660	8	79	34	24	36	●
	5			1536SU05-0660	8	91	53	43	36	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-0660	8	79	34	24	36	●
	5			1536SU05C-0660	8	91	53	43	36	●
	3		Whistle notch shank Schaft	1734SU03C-0660	8	79	34	24	36	●
	5			1736SU05C-0660	8	91	53	43	36	●
	8			1538SU08C-0660	8	114	76	66	36	●
6.7	3	External Extern	Straight shank	1534SU03-0670	8	79	34	24	36	●
	5			1536SU05-0670	8	91	53	43	36	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-0670	8	79	34	24	36	●
	5			1536SU05C-0670	8	91	53	43	36	●
	3		Whistle notch shank Schaft	1734SU03C-0670	8	79	34	24	36	●
	5			1736SU05C-0670	8	91	53	43	36	●
	8			1538SU08C-0670	8	114	76	66	36	●
6.75	3	External Extern	Straight shank	1534SU03-0675	8	79	34	24	36	●
	5			1536SU05-0675	8	91	53	43	36	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-0675	8	79	34	24	36	●
	5			1536SU05C-0675	8	91	53	43	36	●
	3		Whistle notch shank Schaft	1734SU03C-0675	8	79	34	24	36	●
	5			1736SU05C-0675	8	91	53	43	36	●

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
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Grade Sorte	Workpiece material · Werkstückstoff										
	Mild steel Baustahl HB≤180	Carbon steel, Alloy steel	Hardened steel · gehärteter Stahl			Stainless steel Rostfreier Stahl	Cast iron Gusseisen	Nodular cast iron GGG	Aluminum alloy Alu leg.	Copper alloy Kupfer leg.	Heat resist. alloy warmfest. leg.
			~40HRC	~50HRC	~60HRC						
KDG303	✔	✔	✔			✔	✔	✔	✔		✔

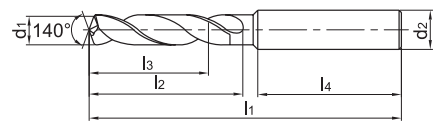
Code key C 8
ISO Kennzeichen
Cutting data 69-81
Schnittdaten
Technical Information C82-87
Technische Information
Non-standart tailor made C 89-93
Bestellformular für Sonderwerkzeuge

SU series · SU Serie

General machining · Allgemeine Bearbeitung

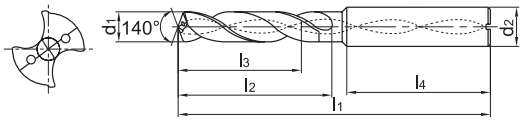

External Coolant
Externe Kühlung

Straight shank
Zylinderschaft



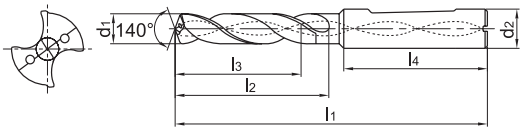

Internal Coolant
Interne Kühlung

Straight shank
Zylinderschaft




Internal Coolant
Interne Kühlung

Whistle notch
shank · Schaft



- For high efficient drilling of P(steel), M (stainless steel) and K(cast iron) with high performance.
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Drill diameter Bohrer Ø $d_1(m_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen					Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	Shank length Schaftlänge	
					$d_2(h_6)$	l_1	l_2	l_3	l_4	KDG303
6.8	3	External Extern	Straight shank	**1534SU03-0680**	8	79	34	24	36	●
	5			**1536SU05-0680**	8	91	53	43	36	●
	3	Internal Intern	Zylinder-schaft	**1534SU03C-0680**	8	79	34	24	36	●
	5			**1536SU05C-0680**	8	91	53	43	36	●
	3		Whistle notch shank Schaft	**1734SU03C-0680**	8	79	34	24	36	●
	5			**1736SU05C-0680**	8	91	53	43	36	●
	8			**1538SU08C-0680**	8	114	76	66	36	●
6.9	3	External Extern	Straight shank	**1534SU03-0690**	8	79	34	24	36	●
	5		Zylinder-schaft	**1536SU05-0690**	8	91	53	43	36	●
	3	Internal Intern		**1534SU03C-0690**	8	79	34	24	36	●
	5			**1536SU05C-0690**	8	91	53	43	36	●
	3		Whistle notch shank Schaft	**1734SU03C-0690**	8	79	34	24	36	●
	5			**1736SU05C-0690**	8	91	53	43	36	●
	8			**1538SU08C-0690**	8	114	76	66	36	●
7.0	3	External Extern	Straight shank	**1534SU03-0700**	8	79	34	24	36	●
	5		Zylinder-schaft	**1536SU05-0700**	8	91	53	43	36	●
	3	Internal Intern		**1534SU03C-0700**	8	79	34	24	36	●
	5			**1536SU05C-0700**	8	91	53	43	36	●
	3		Whistle notch shank Schaft	**1734SU03C-0700**	8	79	34	24	36	●
	5			**1736SU05C-0700**	8	91	53	43	36	●
	8			**1538SU08C-0700**	8	116	76	66	36	●
7.1	3	External Extern	Straight shank	**1534SU03-0710**	8	79	41	29	36	●
	5		Zylinder-schaft	**1536SU05-0710**	8	91	53	43	36	●
	3	Internal Intern		**1534SU03C-0710**	8	79	41	29	36	●
	5			**1536SU05C-0710**	8	91	53	43	36	●
	3		Whistle notch shank Schaft	**1734SU03C-0710**	8	79	41	29	36	●
	5			**1736SU05C-0710**	8	91	53	43	36	●
	8		Straight	**1538SU08C-0710**	8	116	76	66	36	●

Drill diameter Bohrer Ø $d_1(m_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen					Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	Shank length Schaftlänge	
					$d_2(h_6)$	l_1	l_2	l_3	l_4	KDG303
7.2	3	External Extern	Straight shank	1534SU03-0720	8	79	41	29	36	●
	5			1536SU05-0720	8	91	53	43	36	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-0720	8	79	41	29	36	●
	5			1536SU05C-0720	8	91	53	43	36	●
	3		Whistle notch shank Schaft	1734SU03C-0720	8	79	41	29	36	●
	5			1736SU05C-0720	8	91	53	43	36	●
	8			1538SU08C-0720	8	116	76	66	36	●
7.3	3	External Extern	Straight shank	1534SU03-0730	8	79	41	29	36	●
	5		Zylinder-schaft	1536SU05-0730	8	91	53	43	36	●
	3	Internal Intern		1534SU03C-0730	8	79	41	29	36	●
	5			1536SU05C-0730	8	91	53	43	36	●
	3		Whistle notch shank Schaft	1734SU03C-0730	8	79	41	29	36	●
	5			1736SU05C-0730	8	91	53	43	36	●
	8			1538SU08C-0730	8	116	76	66	36	●
7.4	3	External Extern	Straight shank	1534SU03-0740	8	79	41	29	36	●
	5		Zylinder-schaft	1536SU05-0740	8	91	53	43	36	●
	3	Internal Intern		1534SU03C-0740	8	79	41	29	36	●
	5			1536SU05C-0740	8	91	53	43	36	●
	3		Whistle notch shank Schaft	1734SU03C-0740	8	79	41	29	36	●
	5			1736SU05C-0740	8	91	53	43	36	●
	8			1538SU08C-0740	8	116	76	66	36	●
7.5	3	External Extern	Straight shank	1534SU03-0750	8	79	41	29	36	●
	5		Zylinder-schaft	1536SU05-0750	8	91	53	43	36	●
	3	Internal Intern		1534SU03C-0750	8	79	41	29	36	●
	5			1536SU05C-0750	8	91	53	43	36	●
	3		Whistle notch shank Schaft	1734SU03C-0750	8	79	41	29	36	●
	5			1736SU05C-0750	8	91	53	43	36	●
	8			1538SU08C-0750	8	116	76	66	36	●
7.6	3	External Extern	Straight shank	1534SU03-0760	8	79	41	29	36	●
	5		Zylinder-schaft	1536SU05-0760	8	91	53	43	36	●
	3	Internal Intern		1534SU03C-0760	8	79	41	29	36	●
	5			1536SU05C-0760	8	91	53	43	36	●
	3		Whistle notch shank Schaft	1734SU03C-0760	8	79	41	29	36	●
	5			1736SU05C-0760	8	91	53	43	36	●
	8		Straight shank Zylinders.	1538SU08C-0760	8	116	76	66	36	●

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

Grade Sorte	Workpiece material · Werkstückstoff										
	Mild steel Baustahl HB≤180	Carbon steel, Alloy steel	Hardened steel · gehärteter Stahl			Stainless steel Rostfreier Stahl	Cast iron Gusseisen	Nodular cast iron GGG	Aluminum alloy Alu leg.	Copper alloy Kupfer leg.	Heat resist. alloy warmfest. leg.
			~40HRC	~50HRC	~60HRC						
KDG303	✔	✔	✔			✔	✔	✔	✔		✔

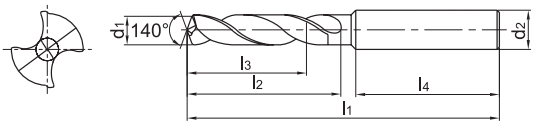
Code key C 8
ISO Kennzeichen
Cutting data 69-81
Schnittdaten
Technical Information C82-87
Technische Information
Non-standart tailor made C 89-93
Bestellformular für Sonderwerkzeuge

SU series · SU Serie

General machining · Allgemeine Bearbeitung

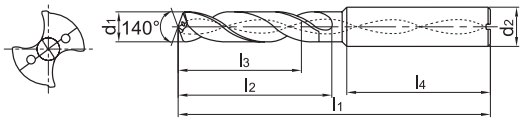

External Coolant
Externe Kühlung

Straight shank
Zylinderschaft



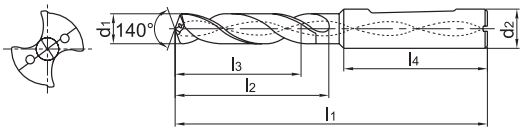

Internal Coolant
Interne Kühlung

Straight shank
Zylinderschaft




Internal Coolant
Interne Kühlung

Whistle notch
shank · Schaft



- For high efficient drilling of P(steel), M (stainless steel) and K(cast iron) with high performance.
- Waveform cutting edges achieve outstanding sharpness and strength, promoting chip removal.
- Hocheffizientes Bohren von allgemeinen Stahlwerkstoffen, rostfreien Werkstoffen und Guss.
- Wellenförmige Schneidkante mit hoher Schneidenschärfe, Stabilität und guter Spanabfuhr.

Drill diameter Bohrer Ø $d_1(m_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen					Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	Shank length Schaftlänge	
					$d_2(h_6)$	l_1	l_2	l_3	l_4	KDG303
7.7	3	External Extern	Straight shank	1534SU03-0770	8	79	41	29	36	●
	5			1536SU05-0770	8	91	53	43	36	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-0770	8	79	41	29	36	●
	5			1536SU05C-0770	8	91	53	43	36	●
	3		Whistle notch shank Schaft	1734SU03C-0770	8	79	41	29	36	●
	5			1736SU05C-0770	8	91	53	43	36	●
	8			1538SU08C-0770	8	116	76	66	36	●
7.8	3	External Extern	Straight shank	1534SU03-0780	8	79	41	29	36	●
	5			1536SU05-0780	8	91	53	43	36	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-0780	8	79	41	29	36	●
	5			1536SU05C-0780	8	91	53	43	36	●
	3		Whistle notch shank Schaft	1734SU03C-0780	8	79	41	29	36	●
	5			1736SU05C-0780	8	91	53	43	36	●
	8			1538SU08C-0780	8	116	76	66	36	●
7.9	3	External Extern	Straight shank	1534SU03-0790	8	79	41	29	36	●
	5			1536SU05-0790	8	91	53	43	36	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-0790	8	79	41	29	36	●
	5			1536SU05C-0790	8	91	53	43	36	●
	3		Whistle notch shank Schaft	1734SU03C-0790	8	79	41	29	36	●
	5			1736SU05C-0790	8	91	53	43	36	●
	8			1538SU08C-0790	8	116	76	66	36	●
8.0	3	External Extern	Straight shank	1534SU03-0800	8	79	41	29	36	●
	5			1536SU05-0800	8	91	53	43	36	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-0800	8	79	41	29	36	●
	5			1536SU05C-0800	8	91	53	43	36	●
	3		Whistle notch shank Schaft	1734SU03C-0800	8	79	41	29	36	●
	5			1736SU05C-0800	8	91	53	43	36	●
	8		Straight	1538SU08C-0800	8	116	76	66	36	●

Drill diameter Bohrer Ø $d_1(m_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen					Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	Shank length Schaftlänge	
					$d_2(h_6)$	l_1	l_2	l_3	l_4	KDG303
8.1	3	External Extern	Straight shank	1534SU03-0810	10	89	47	35	40	●
	5			1536SU05-0810	10	103	61	49	40	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-0810	10	89	47	35	40	●
	5			1536SU05C-0810	10	103	61	49	40	●
	3		Whistle notch shank Schaft	1734SU03C-0810	10	89	47	35	40	●
	5			1736SU05C-0810	10	103	61	49	40	●
	8		Straight shank Zylinders.	1538SU08C-0810	10	142	95	83	40	●
8.2	3	External Extern	Straight shank	1534SU03-0820	10	89	47	35	40	●
	5			1536SU05-0820	10	103	61	49	40	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-0820	10	89	47	35	40	●
	5			1536SU05C-0820	10	103	61	49	40	●
	3		Whistle notch shank Schaft	1734SU03C-0820	10	89	47	35	40	●
	5			1736SU05C-0820	10	103	61	49	40	●
	8		Straight shank Zylinders.	1538SU08C-0820	10	142	95	83	40	●
8.3	3	External Extern	Straight shank	1534SU03-0830	10	89	47	35	40	●
	5			1536SU05-0830	10	103	61	49	40	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-0830	10	89	47	35	40	●
	5			1536SU05C-0830	10	103	61	49	40	●
	3		Whistle notch shank Schaft	1734SU03C-0830	10	89	47	35	40	●
	5			1736SU05C-0830	10	103	61	49	40	●
	8		Straight shank Zylinders.	1538SU08C-0830	10	142	95	83	40	●
8.4	3	External Extern	Straight shank	1534SU03-0840	10	89	47	35	40	●
	5			1536SU05-0840	10	103	61	49	40	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-0840	10	89	47	35	40	●
	5			1536SU05C-0840	10	103	61	49	40	●
	3		Whistle notch shank Schaft	1734SU03C-0840	10	89	47	35	40	●
	5			1736SU05C-0840	10	103	61	49	40	●
	8		Straight shank Zylinders.	1538SU08C-0840	10	142	95	83	40	●
8.5	3	External Extern	Straight shank	1534SU03-0850	10	89	47	35	40	●
	5			1536SU05-0850	10	103	61	49	40	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-0850	10	89	47	35	40	●
	5			1536SU05C-0850	10	103	61	49	40	●
	3		Whistle notch shank Schaft	1734SU03C-0850	10	89	47	35	40	●
	5			1736SU05C-0850	10	103	61	49	40	●
	8		Straight shank Zylinders.	1538SU08C-0850	10	142	95	83	40	●

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

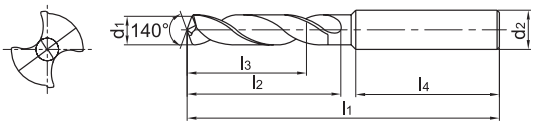
Grade Sorte	Workpiece material · Werkstückstoff										
	Mild steel Baustahl HB≤180	Carbon steel, Alloy steel	Hardened steel · gehärteter Stahl			Stainless steel Rostfreier Stahl	Cast iron Gusseisen	Nodular cast iron GGG	Aluminum alloy Alu leg.	Copper alloy Kupfer leg.	Heat resist. alloy warmfest. leg.
			~40HRC	~50HRC	~60HRC						
KDG303	✔	✔	✔			✔	✔	✔	✔		✔

Code key C 8
ISO Kennzeichen
Cutting data 69-81
Schnittdaten
Technical Information C82-87
Technische Information
Non-standart tailor made C 89-93
Bestellformular für Sonderwerkzeuge

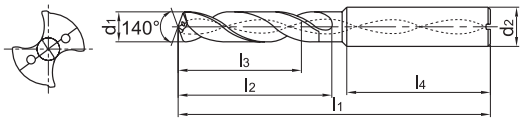
SU series · SU Serie

General machining · Allgemeine Bearbeitung

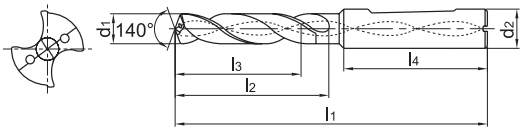

External Coolant
Externe Kühlung
Straight shank
Zylinderschaft




Internal Coolant
Interne Kühlung
Straight shank
Zylinderschaft




Internal Coolant
Interne Kühlung
Whistle notch
shank · Schaft



- For high efficient drilling of P(steel), M (stainless steel) and K(cast iron) with high performance.
- Waveform cutting edges achieve outstanding sharpness and strength, promoting chip removal.
- Hocheffizientes Bohren von allgemeinen Stahlwerkstoffen, rostfreien Werkstoffen und Guss.
- Wellenförmige Schneidkante mit hoher Schneidenschärfe, Stabilität und guter Spanabfuhr.

Drill diameter Bohrer Ø $d_1(m_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen					Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	Shank length Schaftlänge	
					$d_2(h_6)$	l_1	l_2	l_3	l_4	KDG303
8.6	3	External Extern	Straight shank	**1534SU03-0860**	10	89	47	35	40	●
	5			**1536SU05-0860**	10	103	61	49	40	●
	3	Internal Intern	Zylinder-schaft	**1534SU03C-0860**	10	89	47	35	40	●
	5			**1536SU05C-0860**	10	103	61	49	40	●
	3		Whistle notch shank Schaft	**1734SU03C-0860**	10	89	47	35	40	●
	5			**1736SU05C-0860**	10	103	61	49	40	●
	8			**1538SU08C-0860**	10	142	95	83	40	●
8.7	3	External Extern	Straight shank	**1534SU03-0870**	10	89	47	35	40	●
	5			**1536SU05-0870**	10	103	61	49	40	●
	3	Internal Intern	Zylinder-schaft	**1534SU03C-0870**	10	89	47	35	40	●
	5			**1536SU05C-0870**	10	103	61	49	40	●
	3		Whistle notch shank Schaft	**1734SU03C-0870**	10	89	47	35	40	●
	5			**1736SU05C-0870**	10	103	61	49	40	●
	8			**1538SU08C-0870**	10	142	95	83	40	●
8.8	3	External Extern	Straight shank	**1534SU03-0880**	10	89	47	35	40	●
	5			**1536SU05-0880**	10	103	61	49	40	●
	3	Internal Intern	Zylinder-schaft	**1534SU03C-0880**	10	89	47	35	40	●
	5			**1536SU05C-0880**	10	103	61	49	40	●
	3		Whistle notch shank Schaft	**1734SU03C-0880**	10	89	47	35	40	●
	5			**1736SU05C-0880**	10	103	61	49	40	●
	8			**1538SU08C-0880**	10	142	95	83	40	●
8.9	3	External Extern	Straight shank	**1534SU03-0890**	10	89	47	35	40	●
	5			**1536SU05-0890**	10	103	61	49	40	●
	3	Internal Intern	Zylinder-schaft	**1534SU03C-0890**	10	89	47	35	40	●
	5			**1536SU05C-0890**	10	103	61	49	40	●
	3		Whistle notch shank Schaft	**1734SU03C-0890**	10	89	47	35	40	●
	5			**1736SU05C-0890**	10	103	61	49	40	●
	8		Straight	**1538SU08C-0890**	10	142	95	83	40	●

Drill diameter Bohrer Ø $d_1(m_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen					Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	Shank length Schaftlänge	
					$d_2(h_6)$	l_1	l_2	l_3	l_4	KDG303
9.0	3	External Extern	Straight shank	1534SU03-0900	10	89	47	35	40	●
	5			1536SU05-0900	10	103	61	49	40	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-0900	10	89	47	35	40	●
	5			1536SU05C-0900	10	103	61	49	40	●
	3		Whistle notch shank Schaft	1734SU03C-0900	10	89	47	35	40	●
	5			1736SU05C-0900	10	103	61	49	40	●
	8			1538SU08C-0900	10	142	95	83	40	●
9.1	3	External Extern	Straight shank	1534SU03-0910	10	89	47	35	40	●
	5			1536SU05-0910	10	103	61	49	40	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-0910	10	89	47	35	40	●
	5			1536SU05C-0910	10	103	61	49	40	●
	3		Whistle notch shank Schaft	1734SU03C-0910	10	89	47	35	40	●
	5			1736SU05C-0910	10	103	61	49	40	●
	8			1538SU08C-0910	10	142	95	83	40	●
9.2	3	External Extern	Straight shank	1534SU03-0920	10	89	47	35	40	●
	5			1536SU05-0920	10	103	61	49	40	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-0920	10	89	47	35	40	●
	5			1536SU05C-0920	10	103	61	49	40	●
	3		Whistle notch shank Schaft	1734SU03C-0920	10	89	47	35	40	●
	5			1736SU05C-0920	10	103	61	49	40	●
	8			1538SU08C-0920	10	142	95	83	40	●
9.3	3	External Extern	Straight shank	1534SU03-0930	10	89	47	35	40	●
	5			1536SU05-0930	10	103	61	49	40	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-0930	10	89	47	35	40	●
	5			1536SU05C-0930	10	103	61	49	40	●
	3		Whistle notch shank Schaft	1734SU03C-0930	10	89	47	35	40	●
	5			1736SU05C-0930	10	103	61	49	40	●
	8			1538SU08C-0930	10	142	95	83	40	●
9.4	3	External Extern	Straight shank	1534SU03-0940	10	89	47	35	40	●
	5			1536SU05-0940	10	103	61	49	40	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-0940	10	89	47	35	40	●
	5			1536SU05C-0940	10	103	61	49	40	●
	3		Whistle notch shank Schaft	1734SU03C-0940	10	89	47	35	40	●
	5			1736SU05C-0940	10	103	61	49	40	●
	8		Straight shank Zylinders.	1538SU08C-0940	10	142	95	83	40	●

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

Grade Sorte	Workpiece material · Werkstückstoff										
	Mild steel Baustahl HB≤180	Carbon steel, Alloy steel	Hardened steel · gehärteter Stahl			Stainless steel Rostfreier Stahl	Cast iron Gusseisen	Nodular cast iron GGG	Aluminum alloy Alu leg.	Copper alloy Kupfer leg.	Heat resist. alloy warmfest. leg.
			~40HRC	~50HRC	~60HRC						
KDG303	✔	✔	✔			✔	✔	✔	✔		✔

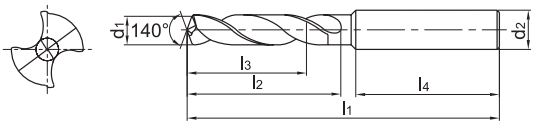
Code key C 8
ISO Kennzeichen
Cutting data 69-81
Schnittdaten
Technical Information C82-87
Technische Information
Non-standart tailor made C 89-93
Bestellformular für Sonderwerkzeuge

SU series · SU Serie

General machining · Allgemeine Bearbeitung

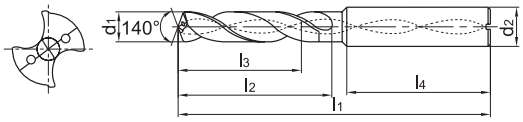

External Coolant
Externe Kühlung

Straight shank
Zylinderschaft



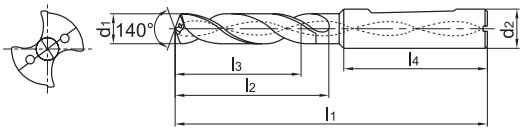

Internal Coolant
Interne Kühlung

Straight shank
Zylinderschaft




Internal Coolant
Interne Kühlung

Whistle notch
shank · Schaft



- For high efficient drilling of P(steel), M (stainless steel) and K(cast iron) with high performance.
- Waveform cutting edges achieve outstanding sharpness and strength, promoting chip removal.
- Hocheffizientes Bohren von allgemeinen Stahlwerkstoffen, rostfreien Werkstoffen und Guss.
- Wellenförmige Schneidkante mit hoher Schneidenschärfe, Stabilität und guter Spanabfuhr.

Drill diameter Bohrer Ø $d_1(m_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen					Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	Shank length Schaftlänge	
					$d_2(h_6)$	l_1	l_2	l_3	l_4	KDG303
9.5	3	External Extern	Straight shank	1534SU03-0950	10	89	47	35	40	●
	5			1536SU05-0950	10	103	61	49	40	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-0950	10	89	47	35	40	●
	5			1536SU05C-0950	10	103	61	49	40	●
	3		Whistle notch shank Schaft	1734SU03C-0950	10	89	47	35	40	●
	5			1736SU05C-0950	10	103	61	49	40	●
	8			1538SU08C-0950	10	142	95	83	40	●
9.6	3	External Extern	Straight shank	1534SU03-0960	10	89	47	35	40	●
	5			1536SU05-0960	10	103	61	49	40	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-0960	10	89	47	35	40	●
	5			1536SU05C-0960	10	103	61	49	40	●
	3		Whistle notch shank Schaft	1734SU03C-0960	10	89	47	35	40	●
	5			1736SU05C-0960	10	103	61	49	40	●
	8			1538SU08C-0960	10	142	95	83	40	●
9.7	3	External Extern	Straight shank	1534SU03-0970	10	89	47	35	40	●
	5			1536SU05-0970	10	103	61	49	40	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-0970	10	89	47	35	40	●
	5			1536SU05C-0970	10	103	61	49	40	●
	3		Whistle notch shank Schaft	1734SU03C-0970	10	89	47	35	40	●
	5			1736SU05C-0970	10	103	61	49	40	●
	8			1538SU08C-0970	10	142	95	83	40	●
9.8	3	External Extern	Straight shank	1534SU03-0980	10	89	47	35	40	●
	5			1536SU05-0980	10	103	61	49	40	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-0980	10	89	47	35	40	●
	5			1536SU05C-0980	10	103	61	49	40	●
	3		Whistle notch shank Schaft	1734SU03C-0980	10	89	47	35	40	●
	5			1736SU05C-0980	10	103	61	49	40	●
	8		Straight	1538SU08C-0980	10	142	95	83	40	●

Drill diameter Bohrer Ø $d_1(m_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen					Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	Shank length Schaftlänge	
					$d_2(h_6)$	l_1	l_2	l_3	l_4	KDG303
9.9	3	External Extern	Straight shank	**1534SU03-0990**	10	89	47	35	40	●
	5			**1536SU05-0990**	10	103	61	49	40	●
	3	Internal Intern	Zylinder-schaft	**1534SU03C-0990**	10	89	47	35	40	●
	5			**1536SU05C-0990**	10	103	61	49	40	●
	3		Whistle notch shank Schaft	**1734SU03C-0990**	10	89	47	35	40	●
	5			**1736SU05C-0990**	10	103	61	49	40	●
	8			**1538SU08C-0990**	10	142	95	83	40	●
10.0	3	External Extern	Straight shank	**1534SU03-1000**	10	89	47	35	40	●
	5		Zylinder-schaft	**1536SU05-1000**	10	103	61	49	40	●
	3	Internal Intern		**1534SU03C-1000**	10	89	47	35	40	●
	5			**1536SU05C-1000**	10	103	61	49	40	●
	3		Whistle notch shank Schaft	**1734SU03C-1000**	10	89	47	35	40	●
	5			**1736SU05C-1000**	10	103	61	49	40	●
	8			**1538SU08C-1000**	10	142	95	83	40	●
10.1	3	External Extern	Straight shank	**1534SU03-1010**	12	102	55	40	45	●
	5		Zylinder-schaft	**1536SU05-1010**	12	118	71	56	45	●
	3	Internal Intern		**1534SU03C-1010**	12	102	55	40	45	●
	5			**1536SU05C-1010**	12	118	71	56	45	●
	3		Whistle notch shank Schaft	**1734SU03C-1010**	12	102	55	40	45	●
	5			**1736SU05C-1010**	12	118	71	56	45	●
	8			**1538SU08C-1010**	12	162	114	99	45	●
10.2	3	External Extern	Straight shank	**1534SU03-1020**	12	102	55	40	45	●
	5		Zylinder-schaft	**1536SU05-1020**	12	118	71	56	45	●
	3	Internal Intern		**1534SU03C-1020**	12	102	55	40	45	●
	5			**1536SU05C-1020**	12	118	71	56	45	●
	3		Whistle notch shank Schaft	**1734SU03C-1020**	12	102	55	40	45	●
	5			**1736SU05C-1020**	12	118	71	56	45	●
	8			**1538SU08C-1020**	12	162	114	99	45	●
10.25	3	External Extern	Straight shank	**1534SU03-1025**	12	102	55	40	45	●
	5		Zylinder-schaft	**1536SU05-1025**	12	118	71	56	45	●
	3	Internal Intern		**1534SU03C-1025**	12	102	55	40	45	●
	5			**1536SU05C-1025**	12	118	71	56	45	●
	3		Whistle notch shank Schaft	**1734SU03C-1025**	12	102	55	40	45	●
	5			**1736SU05C-1025**	12	118	71	56	45	●

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

Grade Sorte	Workpiece material · Werkstückstoff										
	Mild steel Baustahl HB≤180	Carbon steel, Alloy steel	Hardened steel · gehärteter Stahl			Stainless steel Rostfreier Stahl	Cast iron Gusseisen	Nodular cast iron GGG	Aluminum alloy Alu leg.	Copper alloy Kupfer leg.	Heat resist. alloy warmfest. leg.
			~40HRC	~50HRC	~60HRC						
KDG303	✔	✔	✔			✔	✔	✔	✔		✔

Code key C 8
ISO Kennzeichen
Cutting data 69-81
Schnittdaten
Technical Information C82-87
Technische Information
Non-standart tailor made C 89-93
Bestellformular für Sonderwerkzeuge

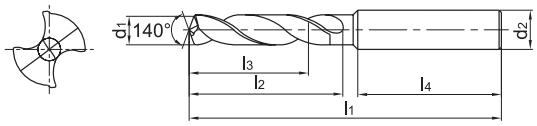
SU series · SU Serie

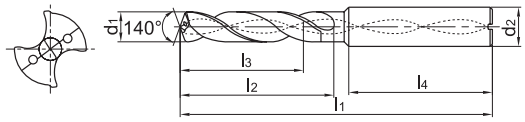
General machining · Allgemeine Bearbeitung

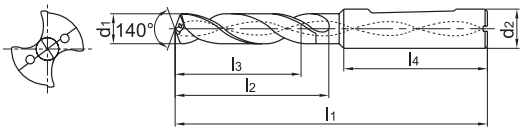

External Coolant
Externe Kühlung
Straight shank
Zylinderschaft


Internal Coolant
Interne Kühlung
Straight shank
Zylinderschaft


Internal Coolant
Interne Kühlung
Whistle notch
shank · Schaft







- For high efficient drilling of P(steel), M (stainless steel) and K(cast iron) with high performance.
- Waveform cutting edges achieve outstanding sharpness and strength, promoting chip removal.
- Hocheffizientes Bohren von allgemeinen Stahlwerkstoffen, rostfreien Werkstoffen und Guss.
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Drill diameter Bohrer Ø $d_1(m_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen					Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	Shank length Schaftlänge	
					$d_2(h_6)$	l_1	l_2	l_3	l_4	KDG303
10.3	3	External Extern	Straight shank	1534SU03-1030	12	102	55	40	45	●
	5			1536SU05-1030	12	118	71	56	45	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-1030	12	102	55	40	45	●
	5			1536SU05C-1030	12	118	71	56	45	●
	3		Whistle notch shank Schaft	1734SU03C-1030	12	102	55	40	45	●
	5			1736SU05C-1030	12	118	71	56	45	●
	8			1538SU08C-1030	12	162	114	99	45	●
10.4	3	External Extern	Straight shank	1534SU03-1040	12	102	55	40	45	●
	5			1536SU05-1040	12	118	71	56	45	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-1040	12	102	55	40	45	●
	5			1536SU05C-1040	12	118	71	56	45	●
	3		Whistle notch shank Schaft	1734SU03C-1040	12	102	55	40	45	●
	5			1736SU05C-1040	12	118	71	56	45	●
	8			1538SU08C-1040	12	162	114	99	45	●
10.5	3	External Extern	Straight shank	1534SU03-1050	12	102	55	40	45	●
	5			1536SU05-1050	12	118	71	56	45	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-1050	12	102	55	40	45	●
	5			1536SU05C-1050	12	118	71	56	45	●
	3		Whistle notch shank Schaft	1734SU03C-1050	12	102	55	40	45	●
	5			1736SU05C-1050	12	118	71	56	45	●
	8			1538SU08C-1050	12	162	114	99	45	●
10.6	3	External Extern	Straight shank	1534SU03-1060	12	102	55	40	45	●
	5			1536SU05-1060	12	118	71	56	45	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-1060	12	102	55	40	45	●
	5			1536SU05C-1060	12	118	71	56	45	●
	3		Whistle notch shank Schaft	1734SU03C-1060	12	102	55	40	45	●
	5			1736SU05C-1060	12	118	71	56	45	●
	8		Straight	1538SU08C-1060	12	162	114	99	45	●

Drill diameter Bohrer Ø $d_1(m_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen					Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	Shank length Schaftlänge	
					$d_2(h_6)$	l_1	l_2	l_3	l_4	KDG303
10.7	3	External Extern	Straight shank	1534SU03-1070	12	102	55	40	45	●
	5			1536SU05-1070	12	118	71	56	45	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-1070	12	102	55	40	45	●
	5			1536SU05C-1070	12	118	71	56	45	●
	3		Whistle notch shank Schaft	1734SU03C-1070	12	102	55	40	45	●
	5			1736SU05C-1070	12	118	71	56	45	●
	8			1538SU08C-1070	12	162	114	99	45	●
10.8	3	External Extern	Straight shank	1534SU03-1080	12	102	55	40	45	●
	5			1536SU05-1080	12	118	71	56	45	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-1080	12	102	55	40	45	●
	5			1536SU05C-1080	12	118	71	56	45	●
	3		Whistle notch shank Schaft	1734SU03C-1080	12	102	55	40	45	●
	5			1736SU05C-1080	12	118	71	56	45	●
	8			1538SU08C-1080	12	162	114	99	45	●
10.9	3	External Extern	Straight shank	1534SU03-1090	12	102	55	40	45	●
	5			1536SU05-1090	12	118	71	56	45	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-1090	12	102	55	40	45	●
	5			1536SU05C-1090	12	118	71	56	45	●
	3		Whistle notch shank Schaft	1734SU03C-1090	12	102	55	40	45	●
	5			1736SU05C-1090	12	118	71	56	45	●
	8			1538SU08C-1090	12	162	114	99	45	●
11.0	3	External Extern	Straight shank	1534SU03-1100	12	102	55	40	45	●
	5			1536SU05-1100	12	118	71	56	45	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-1100	12	102	55	40	45	●
	5			1536SU05C-1100	12	118	71	56	45	●
	3		Whistle notch shank Schaft	1734SU03C-1100	12	102	55	40	45	●
	5			1736SU05C-1100	12	118	71	56	45	●
	8			1538SU08C-1100	12	162	114	99	45	●
11.1	3	External Extern	Straight shank	1534SU03-1110	12	102	55	40	45	●
	5			1536SU05-1110	12	118	71	56	45	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-1110	12	102	55	40	45	●
	5			1536SU05C-1110	12	118	71	56	45	●
	3		Whistle notch shank Schaft	1734SU03C-1110	12	102	55	40	45	●
	5			1736SU05C-1110	12	118	71	56	45	●
	8		Straight shank Zylinders.	1538SU08C-1110	12	162	114	99	45	●

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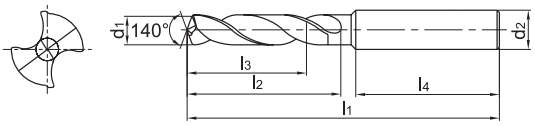
Grade Sorte	Workpiece material · Werkstückstoff										
	Mild steel Baustahl HB≤180	Carbon steel, Alloy steel	Hardened steel · gehärteter Stahl			Stainless steel Rostfreier Stahl	Cast iron Gusseisen	Nodular cast iron GGG	Aluminum alloy Alu leg.	Copper alloy Kupfer leg.	Heat resist. alloy warmfest. leg.
			~40HRC	~50HRC	~60HRC						
KDG303	✔	✔	✔			✔	✔	✔	✔		✔

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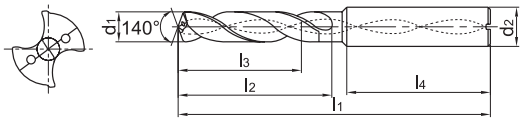
SU series · SU Serie

General machining · Allgemeine Bearbeitung

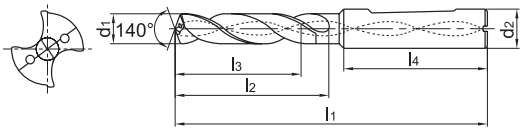

External Coolant
Externe Kühlung
Straight shank
Zylinderschaft




Internal Coolant
Interne Kühlung
Straight shank
Zylinderschaft




Internal Coolant
Interne Kühlung
Whistle notch
shank · Schaft



- For high efficient drilling of P(steel), M (stainless steel) and K(cast iron) with high performance.
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Drill diameter Bohrer Ø $d_1(m_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen					Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	Shank length Schaftlänge	
					$d_2(h_6)$	l_1	l_2	l_3	l_4	KDG303
11.2	3	External Extern	Straight shank	1534SU03-1120	12	102	55	40	45	●
	5			1536SU05-1120	12	118	71	56	45	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-1120	12	102	55	40	45	●
	5			1536SU05C-1120	12	118	71	56	45	●
	3		Whistle notch shank Schaft	1734SU03C-1120	12	102	55	40	45	●
	5			1736SU05C-1120	12	118	71	56	45	●
	8			1538SU08C-1120	12	162	114	99	45	●
11.3	3	External Extern	Straight shank	1534SU03-1130	12	102	55	40	45	●
	5			1536SU05-1130	12	118	71	56	45	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-1130	12	102	55	40	45	●
	5			1536SU05C-1130	12	118	71	56	45	●
	3		Whistle notch shank Schaft	1734SU03C-1130	12	102	55	40	45	●
	5			1736SU05C-1130	12	118	71	56	45	●
	8			1538SU08C-1130	12	162	114	99	45	●
11.4	3	External Extern	Straight shank	1534SU03-1140	12	102	55	40	45	●
	5			1536SU05-1140	12	118	71	56	45	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-1140	12	102	55	40	45	●
	5			1536SU05C-1140	12	118	71	56	45	●
	3		Whistle notch shank Schaft	1734SU03C-1140	12	102	55	40	45	●
	5			1736SU05C-1140	12	118	71	56	45	●
	8			1538SU08C-1140	12	162	114	99	45	●
11.5	3	External Extern	Straight shank	1534SU03-1150	12	102	55	40	45	●
	5			1536SU05-1150	12	118	71	56	45	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-1150	12	102	55	40	45	●
	5			1536SU05C-1150	12	118	71	56	45	●
	3		Whistle notch shank Schaft	1734SU03C-1150	12	102	55	40	45	●
	5			1736SU05C-1150	12	118	71	56	45	●
	8		Straight	1538SU08C-1150	12	162	114	99	45	●

 ● ex Stock Lager ○ on demand · auf Anfrage

Drill diameter Bohrer Ø $d_1(m_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen					Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	Shank length Schaftlänge	
					$d_2(h_6)$	l_1	l_2	l_3	l_4	KDG303
11.6	3	External Extern	Straight shank	**1534SU03-1160**	12	102	55	40	45	●
	5		Zylinder-schaft	**1536SU05-1160**	12	118	71	56	45	●
	3	Internal Intern		**1534SU03C-1160**	12	102	55	40	45	●
	5			**1536SU05C-1160**	12	118	71	56	45	●
	3		Whistle notch shank Schaft	**1734SU03C-1160**	12	102	55	40	45	●
	5			**1736SU05C-1160**	12	118	71	56	45	●
	8			**1538SU08C-1160**	12	162	114	99	45	●
11.7	3	External Extern	Straight shank	**1534SU03-1170**	12	102	55	40	45	●
	5		Zylinder-schaft	**1536SU05-1170**	12	118	71	56	45	●
	3	Internal Intern		**1534SU03C-1170**	12	102	55	40	45	●
	5			**1536SU05C-1170**	12	118	71	56	45	●
	3		Whistle notch shank Schaft	**1734SU03C-1170**	12	102	55	40	45	●
	5			**1736SU05C-1170**	12	118	71	56	45	●
	8			**1538SU08C-1170**	12	162	114	99	45	●
11.8	3	External Extern	Straight shank	**1534SU03-1180**	12	102	55	40	45	●
	5		Zylinder-schaft	**1536SU05-1180**	12	118	71	56	45	●
	3	Internal Intern		**1534SU03C-1180**	12	102	55	40	45	●
	5			**1536SU05C-1180**	12	118	71	56	45	●
	3		Whistle notch shank Schaft	**1734SU03C-1180**	12	102	55	40	45	●
	5			**1736SU05C-1180**	12	118	71	56	45	●
	8			**1538SU08C-1180**	12	162	114	99	45	●
11.9	3	External Extern	Straight shank	**1534SU03-1190**	12	102	55	40	45	●
	5		Zylinder-schaft	**1536SU05-1190**	12	118	71	56	45	●
	3	Internal Intern		**1534SU03C-1190**	12	102	55	40	45	●
	5			**1536SU05C-1190**	12	118	71	56	45	●
	3		Whistle notch shank Schaft	**1734SU03C-1190**	12	102	55	40	45	●
	5			**1736SU05C-1190**	12	118	71	56	45	●
	8			**1538SU08C-1190**	12	162	114	99	45	●
12.0	3	External Extern	Straight shank	**1534SU03-1200**	12	102	55	40	45	●
	5		Zylinder-schaft	**1536SU05-1200**	12	118	71	56	45	●
	3	Internal Intern		**1534SU03C-1200**	12	102	55	40	45	●
	5			**1536SU05C-1200**	12	118	71	56	45	●
	3		Whistle notch shank Schaft	**1734SU03C-1200**	12	102	55	40	45	●
	5			**1736SU05C-1200**	12	118	71	56	45	●
	8		Straight Zylinders.	**1538SU08C-1200**	12	162	114	99	45	●

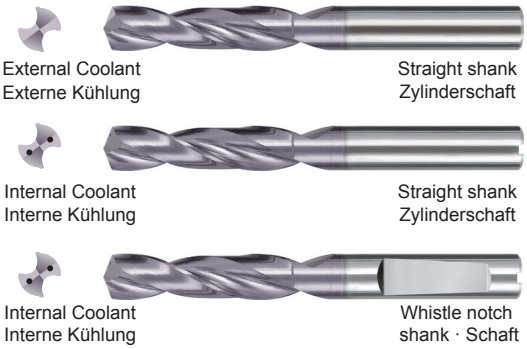
Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

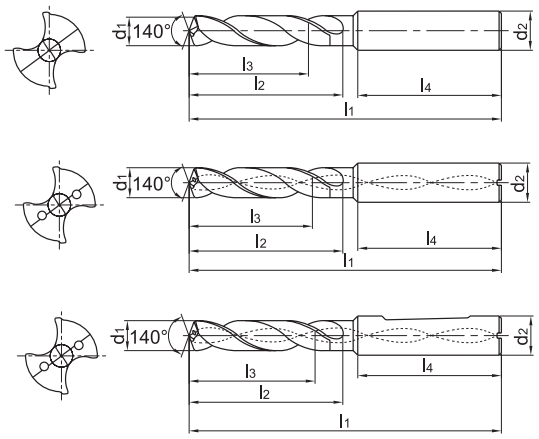
Grade Sorte	Workpiece material · Werkstückstoff										
	Mild steel Baustahl HB≤180	Carbon steel, Alloy steel	Hardened steel · gehärteter Stahl			Stainless steel Rostfreier Stahl	Cast iron Gusseisen	Nodular cast iron GGG	Aluminum alloy Alu leg.	Copper alloy Kupfer leg.	Heat resist. alloy warmfest. leg.
			~40HRC	~50HRC	~60HRC						
KDG303	✔	✔	✔			✔	✔	✔	✔		✔

Code key C 8
ISO Kennzeichen
Cutting data 69-81
Schnittdaten
Technical Information C82-87
Technische Information
Non-standart tailor made C 89-93
Bestellformular für Sonderwerkzeuge

SU series · SU Serie



General machining · Allgemeine Bearbeitung



- For high efficient drilling of P(steel), M (stainless steel) and K(cast iron) with high performance.
- Waveform cutting edges achieve outstanding sharpness and strength, promoting chip removal.
- Hocheffizientes Bohren von allgemeinen Stahlwerkstoffen, rostfreien Werkstoffen und Guss.
- Wellenförmige Schneidkante mit hoher Schneidenschärfe, Stabilität und guter Spanabfuhr.

Drill diameter Bohrer Ø $d_1(m_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen					Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	Shank length Schaftlänge	
					$d_2(h_6)$	l_1	l_2	l_3	l_4	KDG303
12.1	3	External Extern	Straight shank	**1534SU03-1210**	14	107	60	43	45	●
	5			**1536SU05-1210**	14	124	77	60	45	●
	3	Internal Intern	Zylinder-schaft	**1534SU03C-1210**	14	107	60	43	45	●
	5			**1536SU05C-1210**	14	124	77	60	45	●
	3		Whistle notch shank	**1734SU03C-1210**	14	107	60	43	45	●
	5			**1736SU05C-1210**	14	124	77	60	45	●
12.2	3	External Extern	Straight shank	**1534SU03-1220**	14	107	60	43	45	●
	5			**1536SU05-1220**	14	124	77	60	45	●
	3	Internal Intern	Zylinder-schaft	**1534SU03C-1220**	14	107	60	43	45	●
	5			**1536SU05C-1220**	14	124	77	60	45	●
	3		Whistle notch shank	**1734SU03C-1220**	14	107	60	43	45	●
	5			**1736SU05C-1220**	14	124	77	60	45	●
12.25	3	External Extern	Straight shank	**1534SU03-1225**	14	107	60	43	45	●
	5			**1536SU05-1225**	14	124	77	60	45	●
	3	Internal Intern	Zylinder-schaft	**1534SU03C-1225**	14	107	60	43	45	●
	5			**1536SU05C-1225**	14	124	77	60	45	●
	3		Whistle notch shank	**1734SU03C-1225**	14	107	60	43	45	●
	5			**1736SU05C-1225**	14	124	77	60	45	●
12.3	3	External Extern	Straight shank	**1534SU03-1230**	14	107	60	43	45	●
	5			**1536SU05-1230**	14	124	77	60	45	●
	3	Internal Intern	Zylinder-schaft	**1534SU03C-1230**	14	107	60	43	45	●
	5			**1536SU05C-1230**	14	124	77	60	45	●
	3		Whistle notch shank	**1734SU03C-1230**	14	107	60	43	45	●
	5			**1736SU05C-1230**	14	124	77	60	45	●
12.5	3	External Extern	Straight shank	**1534SU03-1250**	14	107	60	43	45	●
	5			**1536SU05-1250**	14	124	77	60	45	●
	3	Internal Intern	Zylinder-schaft	**1534SU03C-1250**	14	107	60	43	45	●
	5			**1536SU05C-1250**	14	124	77	60	45	●
	3		Whistle notch shank	**1734SU03C-1250**	14	107	60	43	45	●
	5			**1736SU05C-1250**	14	124	77	60	45	●
	8		Straight shank	**1538SU08C-1250**	14	178	133	116	45	●
12.7	3	External Extern	Zylinder-schaft	**1534SU03-1270**	14	107	60	43	45	●
	5			**1536SU05-1270**	14	124	77	60	45	●

● ex Stock Lager ○ on demand · auf Anfrage

Drill diameter Bohrer Ø $d_1(m_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen					Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	Shank length Schaftlänge	
					$d_2(h_6)$	l_1	l_2	l_3	l_4	KDG303
12.7	3	Internal Intern	Straight shank Zylinders.	1534SU03C-1270	14	107	60	43	45	●
	5			1536SU05C-1270	14	124	77	60	45	●
	3		Whistle notch shank	1734SU03C-1270	14	107	60	43	45	●
	5			1736SU05C-1270	14	124	77	60	45	●
	8		Straight	1538SU08C-1270	14	178	133	116	45	●
12.75	3	External Extern	Straight shank	1534SU03-1275	14	107	60	43	45	●
	5			1536SU05-1275	14	124	77	60	45	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-1275	14	107	60	43	45	●
	5			1536SU05C-1275	14	124	77	60	45	●
	3		Whistle notch shank	1734SU03C-1275	14	107	60	43	45	●
	5			1736SU05C-1275	14	124	77	60	45	●
12.8	3	External Extern	Straight shank	1534SU03-1280	14	107	60	43	45	●
	5			1536SU05-1280	14	124	77	60	45	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-1280	14	107	60	43	45	●
	5			1536SU05C-1280	14	124	77	60	45	●
	3		Whistle notch shank	1734SU03C-1280	14	107	60	43	45	●
	5			1736SU05C-1280	14	124	77	60	45	●
	8		Straight	1538SU08C-1280	14	178	133	116	45	●
13.0	3	External Extern	Straight shank	1534SU03-1300	14	107	60	43	45	●
	5			1536SU05-1300	14	124	77	60	45	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-1300	14	107	60	43	45	●
	5			1536SU05C-1300	14	124	77	60	45	●
	3		Whistle notch shank	1734SU03C-1300	14	107	60	43	45	●
	5			1736SU05C-1300	14	124	77	60	45	●
	8		Straight	1538SU08C-1300	14	178	133	116	45	●
13.1	3	External Extern	Straight shank	1534SU03-1310	14	107	60	43	45	●
	5			1536SU05-1310	14	124	77	60	45	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-1310	14	107	60	43	45	●
	5			1536SU05C-1310	14	124	77	60	45	●
	3		Whistle notch shank	1734SU03C-1310	14	107	60	43	45	●
	5			1736SU05C-1310	14	124	77	60	45	●
13.5	3	External Extern	Straight shank	1534SU03-1350	14	107	60	43	45	●
	5			1536SU05-1350	14	124	77	60	45	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-1350	14	107	60	43	45	●
	5			1536SU05C-1350	14	124	77	60	45	●
	3		Whistle notch shank	1734SU03C-1350	14	107	60	43	45	●
	5			1736SU05C-1350	14	124	77	60	45	●
	8		Straight	1538SU08C-1350	14	178	133	116	45	●

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

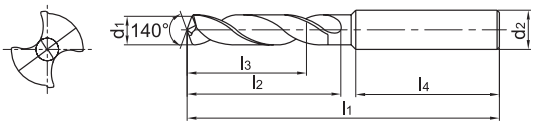
Grade Sorte	Workpiece material · Werkstückstoff										
	Mild steel Baustahl HB≤180	Carbon steel, Alloy steel	Hardened steel · gehärteter Stahl			Stainless steel Rostfreier Stahl	Cast iron Gusseisen	Nodular cast iron GGG	Aluminum alloy Alu leg.	Copper alloy Kupfer leg.	Heat resist. alloy warmfest. leg.
			~40HRC	~50HRC	~60HRC						
KDG303	✔	✔	✔			✔	✔	✔	✔		✔

Code key C 8
ISO Kennzeichen
Cutting data 69-81
Schnittdaten
Technical Information C82-87
Technische Information
Non-standart tailor made C 89-93
Bestellformular für Sonderwerkzeuge

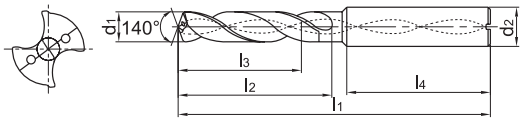
SU series · SU Serie

General machining · Allgemeine Bearbeitung

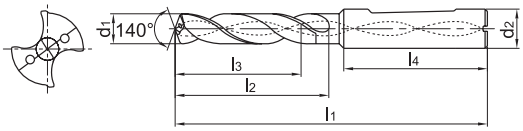

External Coolant
Externe Kühlung
Straight shank
Zylinderschaft




Internal Coolant
Interne Kühlung
Straight shank
Zylinderschaft




Internal Coolant
Interne Kühlung
Whistle notch
shank · Schaft



- For high efficient drilling of P(steel), M (stainless steel) and K(cast iron) with high performance.
- Waveform cutting edges achieve outstanding sharpness and strength, promoting chip removal.
- Hocheffizientes Bohren von allgemeinen Stahlwerkstoffen, rostfreien Werkstoffen und Guss.
- Wellenförmige Schneidkante mit hoher Schneidenschärfe, Stabilität und guter Spanabfuhr.

Drill diameter Bohrer Ø $d_1(m_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen					Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	Shank length Schaftlänge	
					$d_2(h_6)$	l_1	l_2	l_3	l_4	KDG303
13.8	3	External Extern	Straight shank	**1534SU03-1380**	14	107	60	43	45	●
	5			**1536SU05-1380**	14	124	77	60	45	●
	3	Internal Intern	Zylinder-schaft	**1534SU03C-1380**	14	107	60	43	45	●
	5			**1536SU05C-1380**	14	124	77	60	45	●
	3		Whistle notch shank Schaft	**1734SU03C-1380**	14	107	60	43	45	●
	5			**1736SU05C-1380**	14	124	77	60	45	●
14.0	3	External Extern	Straight shank	**1534SU03-1400**	14	107	60	43	45	●
	5			**1536SU05-1400**	14	124	77	60	45	●
	3	Internal Intern	Zylinder-schaft	**1534SU03C-1400**	14	107	60	43	45	●
	5			**1536SU05C-1400**	14	124	77	60	45	●
	3		Whistle notch shank	**1734SU03C-1400**	14	107	60	43	45	●
	5			**1736SU05C-1400**	14	124	77	60	45	●
	8		Straight	**1538SU08C-1400**	14	178	133	116	45	●
14.2	3	External Extern	Straight shank	**1534SU03-1420**	14	107	60	43	45	●
	5			**1536SU05-1420**	14	124	77	60	45	●
	3	Internal Intern	Zylinder-schaft	**1534SU03C-1420**	14	107	60	43	45	●
	5			**1536SU05C-1420**	14	124	77	60	45	●
	3		Whistle notch shank	**1734SU03C-1420**	14	107	60	43	45	●
	5			**1736SU05C-1420**	14	124	77	60	45	●
14.25	3	External Extern	Straight shank	**1534SU03-1425**	16	115	65	45	48	●
	5			**1536SU05-1425**	16	133	83	63	48	●
	3	Internal Intern	Zylinder-schaft	**1534SU03C-1425**	16	115	65	45	48	●
	5			**1536SU05C-1425**	16	133	83	63	48	●
	3		Whistle notch shank	**1734SU03C-1425**	16	115	65	45	48	●
	5			**1736SU05C-1425**	16	133	83	63	48	●
14.3	3	External Extern	Straight shank	**1534SU03-1430**	16	115	65	45	48	●
	5			**1536SU05-1430**	16	133	83	63	48	●
	3	Internal	Zylinder-schaft	**1534SU03C-1430**	16	115	65	45	48	●

● ex Stock Lager ○ on demand · auf Anfrage

Drill diameter Bohrer Ø $d_1(m_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen					Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	Shank length Schaftlänge	
					$d_2(h_6)$	l_1	l_2	l_3	l_4	KDG303
14.3	5	Internal Intern	Straight	**1536SU05C-1430**	16	133	83	63	48	●
	3		Whistle notch shank	**1734SU03C-1430**	16	115	65	45	48	●
	5			**1736SU05C-1430**	16	133	83	63	48	●
14.5	3	External Extern	Straight shank	**1534SU03-1450**	16	115	65	45	48	●
	5			**1536SU05-1450**	16	133	83	63	48	●
	3	Internal Intern	Zylinder-schaft	**1534SU03C-1450**	16	115	65	45	48	●
	5			**1536SU05C-1450**	16	133	83	63	48	●
	3		Whistle notch shank Schaft	**1734SU03C-1450**	16	115	65	45	48	●
	5			**1736SU05C-1450**	16	133	83	63	48	●
	8		Straight shank Zylinder-schaft	**1538SU08C-1450**	16	204	152	132	48	●
14.75	3	External Extern		**1534SU03-1475**	16	115	65	45	48	●
	5			**1536SU05-1475**	16	133	83	63	48	●
	3	Internal Intern		**1534SU03C-1475**	16	115	65	45	48	●
	5			**1536SU05C-1475**	16	133	83	63	48	●
	3		Whistle notch shank Schaft	**1734SU03C-1475**	16	115	65	45	48	●
	5			**1736SU05C-1475**	16	133	83	63	48	●
14.8	3	External Extern	Straight shank Zylinder-schaft	**1534SU03-1480**	16	115	65	45	48	●
	5			**1536SU05-1480**	16	133	83	63	48	●
	3	Internal Intern		**1534SU03C-1480**	16	115	65	45	48	●
	5			**1536SU05C-1480**	16	133	83	63	48	●
	3		Whistle notch shank Schaft	**1734SU03C-1480**	16	115	65	45	48	●
	5			**1736SU05C-1480**	16	133	83	63	48	●
	8		Straight shank Zylinder-schaft	**1538SU08C-1480**	16	204	152	132	48	●
15.0	3	External Extern		**1534SU03-1500**	16	115	65	45	48	●
	5			**1536SU05-1500**	16	133	83	63	48	●
	3	Internal Intern		**1534SU03C-1500**	16	115	65	45	48	●
	5			**1536SU05C-1500**	16	133	83	63	48	●
	3		Whistle notch shank Schaft	**1734SU03C-1500**	16	115	65	45	48	●
	5			**1736SU05C-1500**	16	133	83	63	48	●
	8		Straight shank Zylinder-schaft	**1538SU08C-1500**	16	204	152	132	48	●
15.1	3	External Extern		**1534SU03-1510**	16	115	65	45	48	●
	5			**1536SU05-1510**	16	133	83	63	48	●
	3	Internal Intern		**1534SU03C-1510**	16	115	65	45	48	●
	5			**1536SU05C-1510**	16	133	83	63	48	●
	3		Whistle notch shank Schaft	**1734SU03C-1510**	16	115	65	45	48	●
	5			**1736SU05C-1510**	16	133	83	63	48	●
15.3	3	External	Straight. Zylinder	**1536SU03-1530**	16	115	65	45	48	●
	5	Internal		**1536SU05C-1530**	16	133	83	63	48	●

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

Grade	Workpiece material · Werkstückstoff										
	Mild steel Baustahl HB≤180	Carbon steel, Alloy steel	Hardened steel · gehärteter Stahl			Stainless steel Rostfreier Stahl	Cast iron Gusseisen	Nodular cast iron GGG	Aluminum alloy Alu leg.	Copper alloy Kupfer leg.	Heat resist. alloy warmfest. leg.
			~40HRC	~50HRC	~60HRC						
KDG303	✔	✔	✔			✔	✔	✔	✔		✔

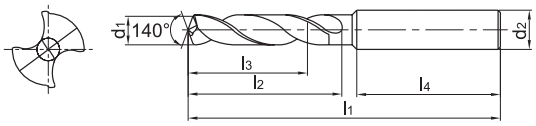
Code key C 8
ISO Kennzeichen
Cutting data 69-81
Schnittdaten
Technical Information C82-87
Technische Information
Non-standart tailor made C 89-93
Bestellformular für Sonderwerkzeuge

SU series · SU Serie

General machining · Allgemeine Bearbeitung

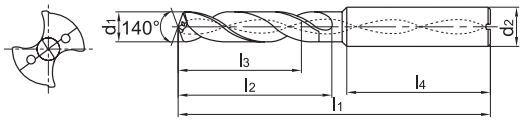

External Coolant
Externe Kühlung

Straight shank
Zylinderschaft



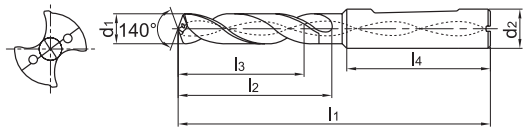

Internal Coolant
Interne Kühlung

Straight shank
Zylinderschaft




Internal Coolant
Interne Kühlung

Whistle notch
shank · Schaft



- For high efficient drilling of P(steel), M (stainless steel) and K(cast iron) with high performance.
- Waveform cutting edges achieve outstanding sharpness and strength, promoting chip removal.
- Hocheffizientes Bohren von allgemeinen Stahlwerkstoffen, rostfreien Werkstoffen und Guss.
- Wellenförmige Schneidkante mit hoher Schneidenschärfe, Stabilität und guter Spanabfuhr.

Drill diameter Bohrer Ø $d_1(m_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen					Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	Shank length Schaftlänge	
					$d_2(h_6)$	l_1	l_2	l_3	l_4	KDG303
15.5	3	External Extern	Straight shank	1534SU03-1550	16	115	65	45	48	●
	5			1536SU05-1550	16	133	83	63	48	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-1550	16	115	65	45	48	●
	5			1536SU05C-1550	16	133	83	63	48	●
	3		Whistle notch shank Schaft	1734SU03C-1550	16	115	65	45	48	●
	5			1736SU05C-1550	16	133	83	63	48	●
	8			1538SU08C-1550	16	204	152	132	48	●
15.8	3	External Extern	Straight shank	1534SU03-1580	16	115	65	45	48	●
	5			1536SU05-1580	16	133	83	63	48	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-1580	16	115	65	45	48	●
	5			1536SU05C-1580	16	133	83	63	48	●
	3		Whistle notch shank Schaft	1734SU03C-1580	16	115	65	45	48	●
	5			1736SU05C-1580	16	133	83	63	48	●
16.0	3	External Extern	Straight shank	1534SU03-1600	16	115	65	45	48	●
	5			1536SU05-1600	16	133	83	63	48	●
	3	Internal Intern	Zylinder-schaft	1534SU03C-1600	16	115	65	45	48	●
	5			1536SU05C-1600	16	133	83	63	48	●
	3		Whistle notch shank Schaft	1734SU03C-1600	16	115	65	45	48	●
	5			1736SU05C-1600	16	133	83	63	48	●
	8			1538SU08C-1600	16	204	152	132	48	●
16.1	3		Straight shank	1534SU03-1610	18	123	73	51	48	●
16.5	3	External Extern		1534SU03-1650	18	123	73	51	48	●
	5		Zylinder-schaft	1536SU05-1650	18	143	93	71	48	●
	3	Internal Intern		1534SU03C-1650	18	123	73	51	48	●
	5			1536SU05C-1650	18	143	93	71	48	●
	3		Whistle notch shank Schaft	1734SU03C-1650	18	123	73	51	48	●
	5			1736SU05C-1650	18	143	93	71	48	●
	8		Straight	1538SU08C-1650	18	223	171	149	48	●

Drill diameter Bohrer Ø $d_1(m_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen					Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	Shank length Schaftlänge	
					$d_2(h_6)$	l_1	l_2	l_3	l_4	KDG303
16.75	3	External Extern	Straight shank	**1534SU03-1675**	18	123	73	51	48	●
	5			**1536SU05-1675**	18	143	93	71	48	●
	3	Internal Intern	Zylinder-schaft	**1534SU03C-1675**	18	123	73	51	48	●
	5			**1536SU05C-1675**	18	143	93	71	48	●
	3		Whistle notch shank Schaft	**1734SU03C-1675**	18	123	73	51	48	●
	5			**1736SU05C-1675**	18	143	93	71	48	●
16.8	3	External Extern	Straight shank	**1534SU03-1680**	18	123	73	51	48	●
	5			**1536SU05-1680**	18	143	93	71	48	●
	3	Internal Intern	Zylinder-schaft	**1534SU03C-1680**	18	123	73	51	48	●
	5			**1536SU05C-1680**	18	143	93	71	48	●
	3		Whistle notch shank Schaft	**1734SU03C-1680**	18	123	73	51	48	●
	5			**1736SU05C-1680**	18	143	93	71	48	●
17.0	3	External Extern	Straight shank	**1534SU03-1700**	18	123	73	51	48	●
	5			**1536SU05-1700**	18	143	93	71	48	●
	3	Internal Intern	Zylinder-schaft	**1534SU03C-1700**	18	123	73	51	48	●
	5			**1536SU05C-1700**	18	143	93	71	48	●
	3		Whistle notch shank Schaft	**1734SU03C-1700**	18	123	73	51	48	●
	5			**1736SU05C-1700**	18	143	93	71	48	●
	8			**1538SU08C-1700**	18	223	171	149	48	●
17.5	3	External Extern	Straight shank	**1534SU03-1750**	18	123	73	51	48	●
	5			**1536SU05-1750**	18	143	93	71	48	●
	3	Internal Intern	Zylinder-schaft	**1534SU03C-1750**	18	123	73	51	48	●
	5			**1536SU05C-1750**	18	143	93	71	48	●
	3		Whistle notch shank Schaft	**1734SU03C-1750**	18	123	73	51	48	●
	5			**1736SU05C-1750**	18	143	93	71	48	●
	8			**1538SU08C-1750**	18	223	171	149	48	●
17.8	3	External Extern	Straight shank	**1534SU03-1780**	18	123	73	51	48	●
	5			**1536SU05-1780**	18	143	93	71	48	●
	3	Internal Intern	Zylinder-schaft	**1534SU03C-1780**	18	123	73	51	48	●
	5			**1536SU05C-1780**	18	143	93	71	48	●
	3		Whistle notch shank Schaft	**1734SU03C-1780**	18	123	73	51	48	●
	5			**1736SU05C-1780**	18	143	93	71	48	●

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

Grade Sorte	Workpiece material · Werkstückstoff										
	Mild steel Baustahl HB≤180	Carbon steel, Alloy steel	Hardened steel · gehärteter Stahl			Stainless steel Rostfreier Stahl	Cast iron Gusseisen	Nodular cast iron GGG	Aluminum alloy Alu leg.	Copper alloy Kupfer leg.	Heat resist. alloy warmfest. leg.
			~40HRC	~50HRC	~60HRC						
KDG303	✔	✔	✔			✔	✔	✔	✔		✔

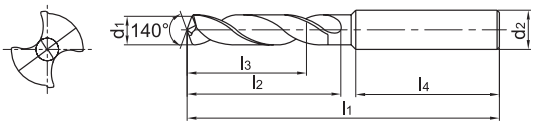
Code key C 8
ISO Kennzeichen
Cutting data 69-81
Schnittdaten
Technical Information C82-87
Technische Information
Non-standart tailor made C 89-93
Bestellformular für Sonderwerkzeuge

SU series · SU Serie

General machining · Allgemeine Bearbeitung

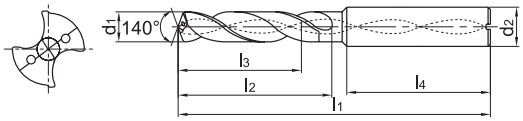

External Coolant
Externe Kühlung

Straight shank
Zylinderschaft



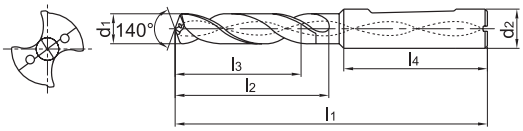

Internal Coolant
Interne Kühlung

Straight shank
Zylinderschaft




Internal Coolant
Interne Kühlung

Whistle notch
shank · Schaft



- For high efficient drilling of P(steel), M (stainless steel) and K(cast iron) with high performance.
- Waveform cutting edges achieve outstanding sharpness and strength, promoting chip removal.
- Hocheffizientes Bohren von allgemeinen Stahlwerkstoffen, rostfreien Werkstoffen und Guss.
- Wellenförmige Schneidkante mit hoher Schneidenschärfe, Stabilität und guter Spanabfuhr.

Drill diameter Bohrer Ø $d_1(m_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen					Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	Shank length Schaftlänge	
					$d_2(h_6)$	l_1	l_2	l_3	l_4	KDG303
18.0	3	External Extern	Straight shank	**1534SU03-1800**	18	123	73	51	48	●
	5			**1536SU05-1800**	18	143	93	71	48	●
	3	Internal Intern	Zylinder-schaft	**1534SU03C-1800**	18	123	73	51	48	●
	5			**1536SU05C-1800**	18	143	93	71	48	●
	3		Whistle notch shank Schaft	**1734SU03C-1800**	18	123	73	51	48	●
	5			**1736SU05C-1800**	18	143	93	71	48	●
	8		Straight shank Zylinder-schaft	**1538SU08C-1800**	18	223	171	149	48	●
18.5	3	External Extern		**1534SU03-1850**	20	131	79	55	50	●
	5			**1536SU05-1850**	20	153	101	77	50	●
	3	Internal Intern		**1534SU03C-1850**	20	131	79	55	50	●
	5			**1536SU05C-1850**	20	153	101	77	50	●
	3		Whistle notch shank Schaft	**1734SU03C-1850**	20	131	79	55	50	●
	5			**1736SU05C-1850**	20	153	101	77	50	●
18.8	3	External Extern	Straight shank Zylinder-schaft	**1534SU03-1880**	20	131	79	55	50	●
	5			**1536SU05-1880**	20	153	101	77	50	●
	3	Internal Intern		**1534SU03C-1880**	20	131	79	55	50	●
	5			**1536SU05C-1880**	20	153	101	77	50	●
	3		Whistle notch shank Schaft	**1734SU03C-1880**	20	131	79	55	50	●
	5			**1736SU05C-1880**	20	153	101	77	50	●
19.0	3	External Extern	Straight shank Zylinder-schaft	**1534SU03-1900**	20	131	79	55	50	●
	5			**1536SU05-1900**	20	153	101	77	50	●
	3	Internal Intern		**1534SU03C-1900**	20	131	79	55	50	●
	5			**1536SU05C-1900**	20	153	101	77	50	●
	3		Whistle notch shank Schaft	**1734SU03C-1900**	20	131	79	55	50	●
	5			**1736SU05C-1900**	20	153	101	77	50	●

 ● ex Stock Lager ○ on demand · auf Anfrage

Drill diameter Bohrer Ø $d_1(m_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen					Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	Shank length Schaftlänge	
					$d_2(h_6)$	l_1	l_2	l_3	l_4	KDG303
19.5	3	External Extern	Straight shank	**1534SU03-1950**	20	131	79	55	50	●
	5			**1536SU05-1950**	20	153	101	77	50	●
	3	Internal Intern	Zylinder-schaft	**1534SU03C-1950**	20	131	79	55	50	●
	5			**1536SU05C-1950**	20	153	101	77	50	●
	3		Whistle notch shank Schaft	**1734SU03C-1950**	20	131	79	55	50	●
	5			**1736SU05C-1950**	20	153	101	77	50	●
19.8	3	External Extern	Straight shank	**1534SU03-1980**	20	131	79	55	50	●
	5			**1536SU05-1980**	20	153	101	77	50	●
	3	Internal Intern	Zylinder-schaft	**1534SU03C-1980**	20	131	79	55	50	●
	5			**1536SU05C-1980**	20	153	101	77	50	●
	3		Whistle notch shank Schaft	**1734SU03C-1980**	20	131	79	55	50	●
	5			**1736SU05C-1980**	20	153	101	77	50	●
20.0	3	External Extern	Straight shank	**1534SU03-2000**	20	131	79	55	50	●
	5			**1536SU05-2000**	20	153	101	77	50	●
	3	Internal Intern	Zylinder-schaft	**1534SU03C-2000**	20	131	79	55	50	●
	5			**1536SU05C-2000**	20	153	101	77	50	●
	3		Whistle notch shank Schaft	**1734SU03C-2000**	20	131	79	55	50	●
	5			**1736SU05C-2000**	20	153	101	77	50	●

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

Grade Sorte	Workpiece material · Werkstückstoff										
	Mild steel Baustahl HB≤180	Carbon steel, Alloy steel	Hardened steel · gehärteter Stahl			Stainless steel Rostfreier Stahl	Cast iron Gusseisen	Nodular cast iron GGG	Aluminum alloy Alu leg.	Copper alloy Kupfer leg.	Heat resist. alloy warmfest. leg.
			~40HRC	~50HRC	~60HRC						
KDG303	✔	✔	✔			✔	✔	✔	✔		✔

Code key C 8
ISO Kennzeichen
Cutting data 69-81
Schnittdaten
Technical Information C82-87
Technische Information
Non-standart tailor made C 89-93
Bestellformular für Sonderwerkzeuge

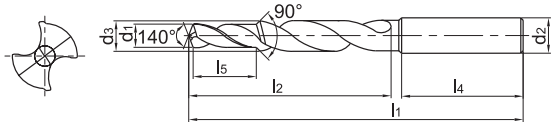
SU series · SU Serie

General machining · Allgemeine Bearbeitung (Step drill · Stufenbohrer)



External Coolant
Externe Kühlung

Straight shank
Zylinderschaft

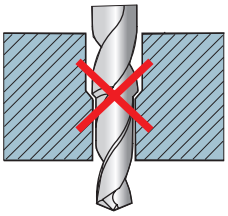


- For thread pre-hole, chamfering.
- Gewindebohrung mit Fase.

Drill diameter d_1(m_8)	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen							Grade Sorte
					Thread size Gewinde	d_2 (h_6)	d_3	l_1	l_2	l_4	l_5	KDG303
3.3	3	External Extern	Straight shank Zylinder-schaft	**1557SU03-M4**	M4	6.0	4.5	66	28	36	11.4	○
4.2	3			**1557SU03-M5**	M5	6.0	6.0	66	28	36	13.6	○
5.0	3			**1557SU03-M6**	M6	8.0	7.0	79	41	36	16.5	○
6.75	3			**1557SU03-M8**	M8	10.0	9.5	89	47	40	21.0	○
8.5	3			**1557SU03-M10**	M10	12.0	12.0	102	55	45	25.5	○
10.25	3			**1557SU03-M12**	M12	14.0	14.0	107	60	45	30.0	○
12.0	3			**1557SU03-M14**	M14	16.0	16.0	115	65	48	34.5	○
14.0	3			**1557SU03-M16**	M16	18.0	18.0	123	73	48	38.5	○
7.0	3			**1557SU03-M8×1.0**	M8×1.0	10.0	9.8	89	47	40	21.0	○
9.0	3			**1557SU03-M10×1.0**	M10×1.0	12.0	12.0	102	55	45	25.5	○
10.5	3			**1557SU03-M12×1.5**	M12×1.5	14.0	14.0	107	60	45	30.0	○
12.5	3			**1557SU03-M14×1.5**	M14×1.5	16.0	16.0	115	65	48	34.5	○
14.5	3			**1557SU03-M16×1.5**	M16×1.5	18.0	18.0	123	73	48	38.5	○

Attentions when using step drill · Einsatzempfehlung für Stufenbohrer

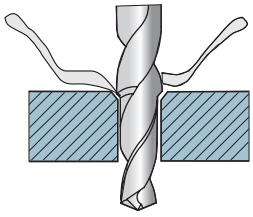
A



Because of no chamfer on the large diameter, countersink drill as shown above is not possible.

Aufgrund der fehlenden Fase, bei großen Durchmessern ist das Aufbohren nicht zu empfehlen.

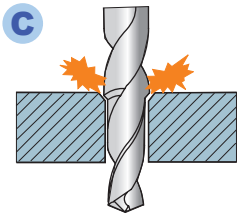
B



Long chips will roll around the drill and obstruct machining when countersink drill. It is recommended to select small feed drilling in order to cut chips.

Beim Ansenken können lange Späne entstehen. Vorschub reduzieren.

C



When countersink drill, cutting force increases at initial. Reduce the feedrate/ please.

Beim Aufbohren werden die Schnittkräfte höher.
Bitte Vorschub reduzieren.

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

Grade Sorte	Workpiece material · Werkstückstoff										
	Mild steel Baustahl HB≤180	Carbon steel, Alloy steel	Hardened steel · gehärteter Stahl			Stainless steel Rostfreier Stahl	Cast iron Gusseisen	Nodular cast iron GGG	Aluminum alloy Alu leg.	Copper alloy Kupfer leg.	Heat resist. alloy warmfest. leg.
			~40HRC	~50HRC	~60HRC						
KDG303	✔	✔	✔			✔	✔	✔	✔		✔

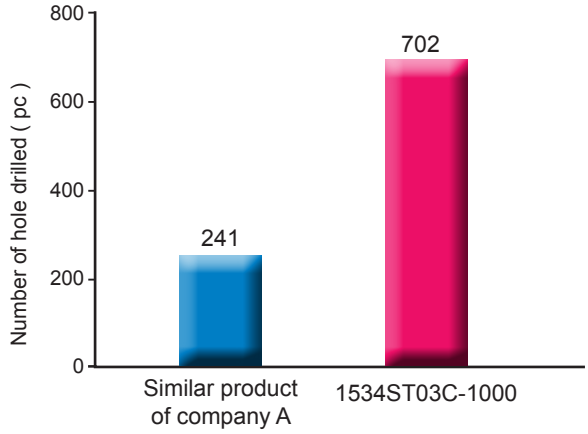


ST series twist drill
Spiralbohrer Serie

For soft steel & stainless steel
Für weichen & rostfreien Stahl

ST special series. A bigger space for chips and its curved edges increases the sharpness of the drills during cutting. Especially suitable for cutting materials with long chips, such as low carbon steels with a high elongation rate and austenitic stainless steel.

Ein definierter Spanraum in Verbindung mit einer scharfen Schneide ermöglicht das Bohren mit einer hohen Produktivität von langspanenden Stahlwerkstoffen und rostfreien Werkstoffen.



Type · Typ:1534ST03C-1000
Size · Größe: Ø10mm
Workpiece material
Werkstückstoff: 1Cr18Ni9Ti
Cutting speed · Schnittgeschw.: 70m/min
Rotating speed · Umdrehung pro min: 2200r/min
Feed rate per revolution
Vorschub pro Umdrehung: 0.15mm/r
Feed speed · Vorschub: 330mm/min
Drilling depth· Bohrtiefe: 30mm(L/D=3)
Cooling system: water-soluble liquid (Internal)
Külmittel : wasserlösliche Emulsion (Intern)
Machine: Mikron UCP 1000


Company A's chips

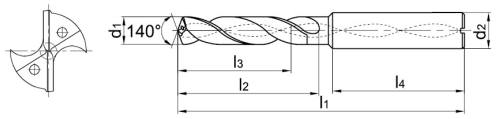

1534ST03C-1000 chips (ZCC CT)

ST series · ST Serie for soft and stainless steel · für weichen & rostfreien Stahl



Internal Coolant
Interne Kühlung

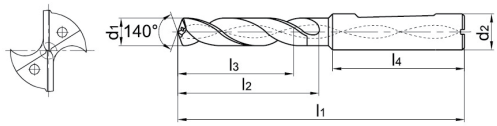
Straight shank
Zylinderschaft





Internal Coolant
Interne Kühlung

Whistle notch
shank · Schaft



- First choice for drilling soft & stainless steel.
- Sharp cutting edge can avoid build-up edge, suitable for drilling hole with high performance.
- Erste Wahl für das Bohren von weichen und rostfreien Stählen.
- Scharfe Schneiden reduzieren bzw. vermeiden Aufbauschneidenbildung. Besonders geeignet für das Hochleistungsbohren.

Drill diameter Bohrer Ø $d_1(m_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen					Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	Shank length Schaftlänge	
					$d_2(h_6)$	l_1	l_2	l_3	l_4	KDG303
3.0	3	Internal · Intern	Straight shank	1534ST03C-0300	6	62	20	14	36	○
	5		Zylinder	1536ST05C-0300	6	66	28	23	36	●
	5		Whistle notch	1736ST05C-0300	6	66	28	23	36	○
3.1	3		Straight shank	1534ST03C-0310	6	62	20	14	36	○
	5		Zylinder	1536ST05C-0310	6	66	28	23	36	●
	5		Whistle notch	1736ST05C-0310	6	66	28	23	36	○
3.2	3		Straight shank	1534ST03C-0320	6	62	20	14	36	○
	5		Zylinder	1536ST05C-0320	6	66	28	23	36	●
	5		Whistle notch	1736ST05C-0320	6	66	28	23	36	○
3.25	3		Straight shank	1534ST03C-0325	6	62	20	14	36	○
	5		Zylinder	1536ST05C-0325	6	66	28	23	36	○
	5		Whistle	1736ST05C-0325	6	66	28	23	36	○
3.3	3		Straight shank	1534ST03C-0330	6	62	20	14	36	○
	5		Zylinder	1536ST05C-0330	6	66	28	23	36	●
	5		Whistle	1736ST05C-0330	6	66	28	23	36	○
3.4	3		Straight shank	1534ST03C-0340	6	62	20	14	36	○
	5		Zylinder	1536ST05C-0340	6	66	28	23	36	●
	5		Whistle	1736ST05C-0340	6	66	28	23	36	○
3.5	3		Straight shank	1534ST03C-0350	6	62	20	14	36	○
	5		Zylinder	1536ST05C-0350	6	66	28	23	36	●
	5		Whistle	1736ST05C-0350	6	66	28	23	36	○
3.6	3		Straight shank	1534ST03C-0360	6	62	20	14	36	○
	5		Zylinder	1536ST05C-0360	6	66	28	23	36	●
	5		Whistle	1736ST05C-0360	6	66	28	23	36	○
3.7	3		Straight shank	1534ST03C-0370	6	62	20	14	36	○
	5		Zylinder	1536ST05C-0370	6	66	28	23	36	●
	5		Whistle	1736ST05C-0370	6	66	28	23	36	○
3.8	3		Straight shank	1534ST03C-0380	6	66	24	17	36	○
	5		Zylinder	1536ST05C-0380	6	74	36	29	36	●
	5		Whistle	1736ST05C-0380	6	74	36	29	36	○

Drill diameter Bohrer Ø $d_1(m_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen					Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	Shank length Schaftlänge	
					$d_2(h_6)$	l_1	l_2	l_3	l_4	KDG303
3.9	3	Internal · Intern	Straight shank Zylinderschaft	**1534ST03C-0390**	6	66	24	17	36	○
	5			**1536ST05C-0390**	6	74	36	29	36	●
	5		Whistle notch shank Schaft	**1736ST05C-0390**	6	74	36	29	36	○
4.0	3		Straight shank Zylinderschaft	**1534ST03C-0400**	6	66	24	17	36	○
	5			**1536ST05C-0400**	6	74	36	29	36	●
	5		Whistle notch shank · Schaft	**1736ST05C-0400**	6	74	36	29	36	○
4.1	3		Straight shank Zylinderschaft	**1534ST03C-0410**	6	66	24	17	36	○
	5			**1536ST05C-0410**	6	74	36	29	36	●
	5		Whistle notch shank · Schaft	**1736ST05C-0410**	6	74	36	29	36	○
4.2	3		Straight shank Zylinderschaft	**1534ST03C-0420**	6	66	24	17	36	○
	5			**1536ST05C-0420**	6	74	36	29	36	●
	5		Whistle notch shank · Schaft	**1736ST05C-0420**	6	74	36	29	36	○
4.3	3		Straight shank Zylinderschaft	**1534ST03C-0430**	6	66	24	17	36	○
	5			**1536ST05C-0430**	6	74	36	29	36	●
	5		Whistle notch shank · Schaft	**1736ST05C-0430**	6	74	36	29	36	○
4.4	3		Straight shank Zylinderschaft	**1534ST03C-0440**	6	66	24	17	36	○
	5			**1536ST05C-0440**	6	74	36	29	36	●
	5		Whistle notch shank · Schaft	**1736ST05C-0440**	6	74	36	29	36	○
4.5	3		Straight shank Zylinderschaft	**1534ST03C-0450**	6	66	24	17	36	○
	5			**1536ST05C-0450**	6	74	36	29	36	●
	5		Whistle notch shank · Schaft	**1736ST05C-0450**	6	74	36	29	36	○
4.6	3		Straight shank Zylinderschaft	**1534ST03C-0460**	6	66	24	17	36	○
	5			**1536ST05C-0460**	6	74	36	29	36	●
	5		Whistle notch shank · Schaft	**1736ST05C-0460**	6	74	36	29	36	○
4.65	3		Straight shank Zylinderschaft	**1534ST03C-0465**	6	66	24	17	36	○
	5			**1536ST05C-0465**	6	74	36	29	36	○
	5		Whistle notch shank · Schaft	**1736ST05C-0465**	6	74	36	29	36	○
4.7	3		Straight shank Zylinderschaft	**1534ST03C-0470**	6	66	24	17	36	○
	5			**1536ST05C-0470**	6	74	36	29	36	●
	5		Whistle notch shank · Schaft	**1736ST05C-0470**	6	74	36	29	36	○
4.8	3		Straight shank Zylinderschaft	**1534ST03C-0480**	6	66	28	20	36	○
	5			**1536ST05C-0480**	6	82	44	35	36	●
	5		Whistle notch shank · Schaft	**1736ST05C-0480**	6	82	44	35	36	○

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

Grade Sorte	Workpiece material · Werkstückstoff										
	Mild steel Baustahl HB≤180	Carbon steel, Alloy steel	Hardened steel · gehärteter Stahl			Stainless steel Rostfreier Stahl	Cast iron Gusseisen	Nodular cast iron GGG	Aluminum alloy Alu leg.	Copper alloy Kupfer leg.	Heat resist. alloy warmfest. leg.
			~40HRC	~50HRC	~60HRC						
KDG303	✔	✔				✔					✔

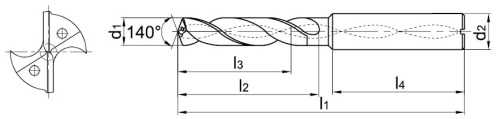
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ISO Kennzeichen
Cutting data 69-81
Schnittdaten
Technical Information C82-87
Technische Information
Non-standart tailor made C 89-93
Bestellformular für Sonderwerkzeuge

ST series · ST Serie for soft and stainless steel · für weichen & rostfreien Stahl



Internal Coolant
Interne Kühlung

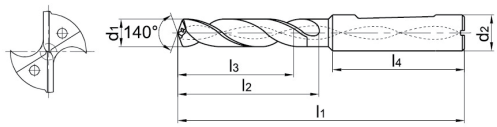
Straight shank
Zylinderschaft





Internal Coolant
Interne Kühlung

Whistle notch
shank · Schaft



- First choice for drilling soft & stainless steel.
- Sharp cutting edge can avoid build-up edge, suitable for drilling with high performance.
- Erste Wahl für das Bohren von weichen und rostfreien Stählen.
- Scharfe Schneiden reduzieren bzw. vermeiden Aufbauschneidenbildung. Besonders geeignet für das Hochleistungsbohren.

Drill diameter Bohrer Ø $d_1(m_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen					Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	Shank length Schaftlänge	
					$d_2(h_6)$	l_1	l_2	l_3	l_4	KDG303
4.9	3	Internal · Intern	Straight shank Zylinderschaft	**1534ST03C-0490**	6	66	28	20	36	○
	5			**1536ST05C-0490**	6	82	44	35	36	●
	5		Whistle notch shank · Schaft	**1736ST05C-0490**	6	82	44	35	36	○
5.0	3		Straight shank Zylinderschaft	**1534ST03C-0500**	6	66	28	20	36	○
	5			**1536ST05C-0500**	6	82	44	35	36	●
	5		Whistle notch shank · Schaft	**1736ST05C-0500**	6	82	44	35	36	○
5.1	3		Straight shank Zylinderschaft	**1534ST03C-0510**	6	66	28	20	36	○
	5			**1536ST05C-0510**	6	82	44	35	36	●
	5		Whistle notch shank · Schaft	**1736ST05C-0510**	6	82	44	35	36	○
5.2	3		Straight shank Zylinderschaft	**1534ST03C-0520**	6	66	28	20	36	○
	5			**1536ST05C-0520**	6	82	44	35	36	●
	5		Whistle notch shank · Schaft	**1736ST05C-0520**	6	82	44	35	36	○
5.3	3		Straight shank Zylinderschaft	**1534ST03C-0530**	6	66	28	20	36	○
	5			**1536ST05C-0530**	6	82	44	35	36	●
	5		Whistle notch shank · Schaft	**1736ST05C-0530**	6	82	44	35	36	○
5.4	3		Straight shank Zylinderschaft	**1534ST03C-0540**	6	66	28	20	36	○
	5			**1536ST05C-0540**	6	82	44	35	36	●
	5		Whistle notch shank · Schaft	**1736ST05C-0540**	6	82	44	35	36	○
5.5	3		Straight shank Zylinderschaft	**1534ST03C-0550**	6	66	28	20	36	○
	5			**1536ST05C-0550**	6	82	44	35	36	●
	5		Whistle notch shank · Schaft	**1736ST05C-0550**	6	82	44	35	36	○
5.55	3		Straight shank Zylinderschaft	**1534ST03C-0555**	6	66	28	20	36	○
	5			**1536ST05C-0555**	6	82	44	35	36	○
	5		Whistle notch shank · Schaft	**1736ST05C-0555**	6	82	44	35	36	○
5.6	3		Straight shank Zylinderschaft	**1534ST03C-0560**	6	66	28	20	36	○
	5			**1536ST05C-0560**	6	82	44	35	36	●
	5		Whistle notch shank · Schaft	**1736ST05C-0560**	6	82	44	35	36	○
5.7	3		Straight shank Zylinderschaft	**1534ST03C-0570**	6	66	28	20	36	○
	5			**1536ST05C-0570**	6	82	44	35	36	●
	5		Whistle notch shank · Schaft	**1736ST05C-0570**	6	82	44	35	36	○

Drill diameter Bohrer Ø $d_1(m_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen					Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	Shank length Schaftlänge	
					$d_2(h_6)$	l_1	l_2	l_3	l_4	KDG303
5.8	3	Internal · Intern	Straight shank Zylinderschaft	**1534ST03C-0580**	6	66	28	20	36	○
	5			**1536ST05C-0580**	6	82	44	35	36	●
	5		Whistle notch shank Schaft	**1736ST05C-0580**	6	82	44	35	36	○
5.9	3		Straight shank Zylinderschaft	**1534ST03C-0590**	6	66	28	20	36	○
	5			**1536ST05C-0590**	6	82	44	35	36	●
	5		Whistle notch shank · Schaft	**1736ST05C-0590**	6	82	44	35	36	○
6.0	3		Straight shank Zylinderschaft	**1534ST03C-0600**	6	66	28	20	36	○
	5			**1536ST05C-0600**	6	82	44	35	36	●
	5		Whistle notch shank · Schaft	**1736ST05C-0600**	6	82	44	35	36	○
6.1	3		Straight shank Zylinderschaft	**1534ST03C-0610**	8	79	34	24	36	○
	5			**1536ST05C-0610**	8	91	53	43	36	●
	5		Whistle notch shank · Schaft	**1736ST05C-0610**	8	91	53	43	36	○
6.2	3		Straight shank Zylinderschaft	**1534ST03C-0620**	8	79	34	24	36	○
	5			**1536ST05C-0620**	8	91	53	43	36	●
	5		Whistle notch shank · Schaft	**1736ST05C-0620**	8	91	53	43	36	○
6.3	3		Straight shank Zylinderschaft	**1534ST03C-0630**	8	79	34	24	36	○
	5			**1536ST05C-0630**	8	91	53	43	36	●
	5		Whistle notch shank · Schaft	**1736ST05C-0630**	8	91	53	43	36	○
6.4	3		Straight shank Zylinderschaft	**1534ST03C-0640**	8	79	34	24	36	○
	5			**1536ST05C-0640**	8	91	53	43	36	●
	5		Whistle notch shank · Schaft	**1736ST05C-0640**	8	91	53	43	36	○
6.5	3		Straight shank Zylinderschaft	**1534ST03C-0650**	8	79	34	24	36	○
	5			**1536ST05C-0650**	8	91	53	43	36	●
	5		Whistle notch shank · Schaft	**1736ST05C-0650**	8	91	53	43	36	○
6.6	3		Straight shank Zylinderschaft	**1534ST03C-0660**	8	79	34	24	36	○
	5			**1536ST05C-0660**	8	91	53	43	36	●
	5		Whistle notch shank · Schaft	**1736ST05C-0660**	8	91	53	43	36	○
6.7	3		Straight shank Zylinderschaft	**1534ST03C-0670**	8	79	34	24	36	○
	5			**1536ST05C-0670**	8	91	53	43	36	●
	5		Whistle notch shank · Schaft	**1736ST05C-0670**	8	91	53	43	36	○
6.75	3		Straight shank Zylinderschaft	**1534ST03C-0675**	8	79	34	24	36	○
	5			**1536ST05C-0675**	8	91	53	43	36	○
	5		Whistle notch shank · Schaft	**1736ST05C-0675**	8	91	53	43	36	○
6.80	5		Straight shank Zylinderschaft	**1536ST05C-0680**	8	91	53	43	36	●

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
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Grade Sorte	Workpiece material · Werkstückstoff										
	Mild steel Baustahl HB≤180	Carbon steel, Alloy steel	Hardened steel · gehärteter Stahl			Stainless steel Rostfreier Stahl	Cast iron Gusseisen	Nodular cast iron GGG	Aluminum alloy Alu leg.	Copper alloy Kupfer leg.	Heat resist. alloy warmfest leg.
			~40HRC	~50HRC	~60HRC						
KDG303	✔	✔				✔					✔

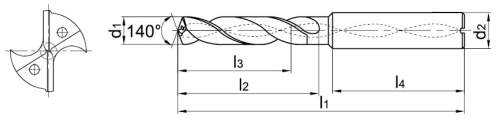
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ISO Kennzeichen
Cutting data 69-81
Schnittdaten
Technical Information C82-87
Technische Information
Non-standart tailor made C 89-93
Bestellformular für Sonderwerkzeuge

ST series · ST Serie for soft and stainless steel · für weichen & rostfreien Stahl



Internal Coolant
Interne Kühlung

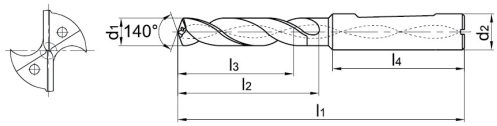
Straight shank
Zylinderschaft





Internal Coolant
Interne Kühlung

Whistle notch
shank · Schaft



- First choice for drilling soft & stainless steel.
- Sharp cutting edge can avoid build-up edge, suitable for drilling with high performance.
- Erste Wahl für das Bohren von weichen und rostfreien Stählen.
- Scharfe Schneiden reduzieren bzw. vermeiden Aufbauschneidenbildung. Besonders geeignet für das Hochleistungsbohren.

Drill diameter Bohrer Ø $d_1(m_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen					Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	Shank length Schaftlänge	
					$d_2(h_6)$	l_1	l_2	l_3	l_4	KDG303
6.9	3	Internal · Intern	Straight shank Zylinderschaft	1534ST03C-0690	8	79	34	24	36	○
	5			1536ST05C-0690	8	91	53	43	36	●
	5		Whistle notch shank · Schaft	1736ST05C-0690	8	91	53	43	36	○
7.0	3		Straight shank Zylinderschaft	1534ST03C-0700	8	79	34	24	36	○
	5			1536ST05C-0700	8	91	53	43	36	●
	5		Whistle notch shank · Schaft	1736ST05C-0700	8	91	53	43	36	○
7.1	3		Straight shank Zylinderschaft	1534ST03C-0710	8	79	41	29	36	○
	5			1536ST05C-0710	8	91	53	43	36	●
	5		Whistle notch shank · Schaft	1736ST05C-0710	8	91	53	43	36	○
7.2	3		Straight shank Zylinderschaft	1534ST03C-0720	8	79	41	29	36	○
	5			1536ST05C-0720	8	91	53	43	36	●
	5		Whistle notch shank · Schaft	1736ST05C-0720	8	91	53	43	36	○
7.3	3		Straight shank Zylinderschaft	1534ST03C-0730	8	79	41	29	36	○
	5			1536ST05C-0730	8	91	53	43	36	●
	5		Whistle notch shank · Schaft	1736ST05C-0730	8	91	53	43	36	○
7.4	3		Straight shank Zylinderschaft	1534ST03C-0740	8	79	41	29	36	○
	5			1536ST05C-0740	8	91	53	43	36	●
	5		Whistle notch shank · Schaft	1736ST05C-0740	8	91	53	43	36	○
7.5	3		Straight shank Zylinder-schaft	1534ST03C-0750	8	79	41	29	36	○
	5			1536ST05C-0750	8	91	53	43	36	●
	5		Whistle notch shank · Schaft	1736ST05C-0750	8	91	53	43	36	○
7.6	3		Straight shank Zylinderschaft	1534ST03C-0760	8	79	41	29	36	○
	5			1536ST05C-0760	8	91	53	43	36	●
	5		Whistle notch shank · Schaft	1736ST05C-0760	8	91	53	43	36	○
7.7	3		Straight shank Zylinderschaft	1534ST03C-0770	8	79	41	29	36	○
	5			1536ST05C-0770	8	91	53	43	36	●
	5		Whistle notch shank · Schaft	1736ST05C-0770	8	91	53	43	36	○
7.8	3		Straight shank Zylinderschaft	1534ST03C-0780	8	79	41	29	36	○
	5			1536ST05C-0780	8	91	53	43	36	●
	5		Whistle notch shank · Schaft	1736ST05C-0780	8	91	53	43	36	○

Drill diameter Bohrer Ø $d_1(m_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen					Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	Shank length Schaftlänge	
					$d_2(h_6)$	l_1	l_2	l_3	l_4	KDG303
7.9	3	Internal · Intern	Straight shank Zylinderschaft	1534ST03C-0790	8	79	41	29	36	○
	5			1536ST05C-0790	8	91	53	43	36	●
	5		Whistle notch shank Schaft	1736ST05C-0790	8	91	53	43	36	○
8.0	3		Straight shank Zylinderschaft	1534ST03C-0800	8	79	41	29	36	○
	5			1536ST05C-0800	8	91	53	43	36	●
	5		Whistle notch shank · Schaft	1736ST05C-0800	8	91	53	43	36	○
8.1	3		Straight shank Zylinderschaft	1534ST03C-0810	10	89	47	35	40	○
	5			1536ST05C-0810	10	103	61	49	40	●
	5		Whistle notch shank · Schaft	1736ST05C-0810	10	103	61	49	40	○
8.2	3		Straight shank Zylinderschaft	1534ST03C-0820	10	89	47	35	40	○
	5			1536ST05C-0820	10	103	61	49	40	●
	5		Whistle notch shank · Schaft	1736ST05C-0820	10	103	61	49	40	○
8.3	3		Straight shank Zylinderschaft	1534ST03C-0830	10	89	47	35	40	○
	5			1536ST05C-0830	10	103	61	49	40	●
	5		Whistle notch shank · Schaft	1736ST05C-0830	10	103	61	49	40	○
8.4	3		Straight shank Zylinderschaft	1534ST03C-0840	10	89	47	35	40	○
	5			1536ST05C-0840	10	103	61	49	40	●
	5		Whistle notch shank · Schaft	1736ST05C-0840	10	103	61	49	40	○
8.5	3		Straight shank Zylinderschaft	1534ST03C-0850	10	89	47	35	40	○
	5			1536ST05C-0850	10	103	61	49	40	●
	5		Whistle notch shank · Schaft	1736ST05C-0850	10	103	61	49	40	○
8.6	3		Straight shank Zylinderschaft	1534ST03C-0860	10	89	47	35	40	○
	5			1536ST05C-0860	10	103	61	49	40	●
	5		Whistle notch shank · Schaft	1736ST05C-0860	10	103	61	49	40	○
8.7	3		Straight shank Zylinderschaft	1534ST03C-0870	10	89	47	35	40	○
	5			1536ST05C-0870	10	103	61	49	40	●
	5		Whistle notch shank · Schaft	1736ST05C-0870	10	103	61	49	40	○
8.8	3		Straight shank Zylinderschaft	1534ST03C-0880	10	89	47	35	40	○
	5			1536ST05C-0880	10	103	61	49	40	●
	5		Whistle notch shank · Schaft	1736ST05C-0880	10	103	61	49	40	○
8.9	3		Straight shank Zylinderschaft	1534ST03C-0890	10	89	47	35	40	○
	5			1536ST05C-0890	10	103	61	49	40	●
	5		Whistle notch shank · Schaft	1736ST05C-0890	10	103	61	49	40	○
9.0	3		Straight shank Zylinderschaft	1534ST03C-0900	10	89	47	35	40	○
	5			1536ST05C-0900	10	103	61	49	40	●
	5		Whistle notch shank · Schaft	1736ST05C-0900	10	103	61	49	40	○

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

Grade Sorte	Workpiece material · Werkstückstoff										
	Mild steel Baustahl HB≤180	Carbon steel, Alloy steel	Hardened steel · gehärteter Stahl			Stainless steel Rostfreier Stahl	Cast iron Gusseisen	Nodular cast iron GGG	Aluminum alloy Alu leg.	Copper alloy Kupfer leg.	Heat resist. alloy warmfest leg.
			~40HRC	~50HRC	~60HRC						
KDG303	✔	✔				✔					✔

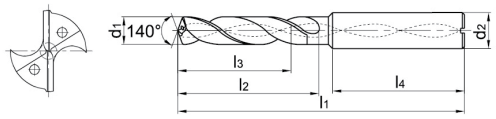
Code key C 8
ISO Kennzeichen
Cutting data 69-81
Schnittdaten
Technical Information C82-87
Technische Information
Non-standart tailor made C 89-93
Bestellformular für Sonderwerkzeuge

ST series · ST Serie for soft and stainless steel · für weichen & rostfreien Stahl



Internal Coolant
Interne Kühlung

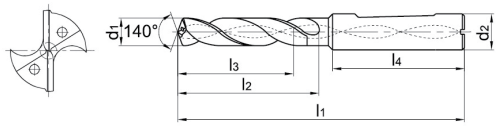
Straight shank
Zylinderschaft





Internal Coolant
Interne Kühlung

Whistle notch
shank · Schaft



- First choice for drilling soft & stainless steel.
- Sharp cutting edge can avoid build-up edge, suitable for drilling with high performance.
- Erste Wahl für das Bohren von weichen und rostfreien Stählen.
- Scharfe Schneiden reduzieren bzw. vermeiden Aufbauschneidenbildung. Besonders geeignet für das Hochleistungsbohren.

Drill diameter Bohrer Ø $d_1(m_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen					Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	Shank length Schaftlänge	
					$d_2(h_6)$	l_1	l_2	l_3	l_4	KDG303
9.1	3	Internal · Intern	Straight shank Zylinderschaft	**1534ST03C-0910**	10	89	47	35	40	○
	5			**1536ST05C-0910**	10	103	61	49	40	●
	5		Whistle notch shank · Schaft	**1736ST05C-0910**	10	103	61	49	40	○
9.2	5		Straight shank Zylinderschaft	**1536ST05C-0920**	10	103	61	49	40	●
9.3	3			**1534ST03C-0930**	10	89	47	35	40	○
	5			**1536ST05C-0930**	10	103	61	49	40	●
	5		Whistle notch shank · Schaft	**1736ST05C-0930**	10	103	61	49	40	○
9.4	3		Straight shank Zylinderschaft	**1534ST03C-0940**	10	89	47	35	40	○
	5			**1536ST05C-0940**	10	103	61	49	40	●
	5		Whistle notch shank · Schaft	**1736ST05C-0940**	10	103	61	49	40	○
9.5	3		Straight shank Zylinderschaft	**1534ST03C-0950**	10	89	47	35	40	○
	5			**1536ST05C-0950**	10	103	61	49	40	●
	5		Whistle notch shank · Schaft	**1736ST05C-0950**	10	103	61	49	40	○
9.6	3		Straight shank Zylinderschaft	**1534ST03C-0960**	10	89	47	35	40	○
	5			**1536ST05C-0960**	10	103	61	49	40	●
	5		Whistle notch shank · Schaft	**1736ST05C-0960**	10	103	61	49	40	○
9.7	3		Straight shank Zylinderschaft	**1534ST03C-0970**	10	89	47	35	40	○
	5			**1536ST05C-0970**	10	103	61	49	40	●
	5		Whistle notch shank · Schaft	**1736ST05C-0970**	10	103	61	49	40	○
9.8	3		Straight shank Zylinderschaft	**1534ST03C-0980**	10	89	47	35	40	○
	5			**1536ST05C-0980**	10	103	61	49	40	●
	5		Whistle notch shank · Schaft	**1736ST05C-0980**	10	103	61	49	40	○
9.9	3		Straight shank Zylinderschaft	**1534ST03C-0990**	10	89	47	35	40	○
	5			**1536ST05C-0990**	10	103	61	49	40	●
	5		Whistle notch shank · Schaft	**1736ST05C-0990**	10	103	61	49	40	○
10.0	3		Straight shank Zylinderschaft	**1534ST03C-1000**	10	89	47	35	40	○
	5			**1536ST05C-1000**	10	103	61	49	40	●
	5		Whistle notch shank · Schaft	**1736ST05C-1000**	10	103	61	49	40	○
10.1	3		Straight shank Zylinderschaft	**1534ST03C-1010**	12	102	55	40	45	○
	5			**1536ST05C-1010**	12	118	71	56	45	●
	5		Whistle notch shank · Schaft	**1736ST05C-1010**	12	118	71	56	45	○

● ex Stock Lager ○ on demand · auf Anfrage

Drill diameter Bohrer Ø $d_1(m_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen					Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	Shank length Schaftlänge	
					$d_2(h_6)$	l_1	l_2	l_3	l_4	KDG303
10.2	5	Internal · Intern	Straight shank Zylinderschaft	**1536ST05C-1020**	12	118	71	56	45	●
10.25	3			**1534ST03C-1025**	12	102	55	40	45	○
	5			**1536ST05C-1025**	12	118	71	56	45	○
	5		Whistle notch	**1736ST05C-1025**	12	118	71	56	45	○
10.3	3		Straight shank Zylinderschaft	**1534ST03C-1030**	12	102	55	40	45	○
	5			**1536ST05C-1030**	12	118	71	56	45	●
	5		Whistle notch	**1736ST05C-1030**	12	118	71	56	45	○
10.4	3		Straight shank Zylinderschaft	**1534ST03C-1040**	12	102	55	40	45	○
	5			**1536ST05C-1040**	12	118	71	56	45	●
	5		Whistle notch	**1736ST05C-1040**	12	118	71	56	45	○
10.5	3		Straight shank Zylinderschaft	**1534ST03C-1050**	12	102	55	40	45	○
	5			**1536ST05C-1050**	12	118	71	56	45	●
	5		Whistle notch	**1736ST05C-1050**	12	118	71	56	45	○
10.6	3		Straight shank Zylinderschaft	**1534ST03C-1060**	12	102	55	40	45	○
	5			**1536ST05C-1060**	12	118	71	56	45	●
	5		Whistle notch	**1736ST05C-1060**	12	118	71	56	45	○
10.7	3		Straight shank Zylinderschaft	**1534ST03C-1070**	12	102	55	40	45	○
	5			**1536ST05C-1070**	12	118	71	56	45	●
	5		Whistle notch	**1736ST05C-1070**	12	118	71	56	45	○
10.8	3		Straight shank Zylinderschaft	**1534ST03C-1080**	12	102	55	40	45	○
	5			**1536ST05C-1080**	12	118	71	56	45	●
	5		Whistle notch	**1736ST05C-1080**	12	118	71	56	45	○
10.9	3		Straight shank Zylinderschaft	**1534ST03C-1090**	12	102	55	40	45	○
	5			**1536ST05C-1090**	12	118	71	56	45	●
	5		Whistle notch	**1736ST05C-1090**	12	118	71	56	45	○
11.0	3		Straight shank Zylinderschaft	**1534ST03C-1100**	12	102	55	40	45	○
	5			**1536ST05C-1100**	12	118	71	56	45	●
	5		Whistle notch	**1736ST05C-1100**	12	118	71	56	45	○
11.1	3		Straight shank Zylinderschaft	**1534ST03C-1110**	12	102	55	40	45	○
	5			**1536ST05C-1110**	12	118	71	56	45	●
	5		Whistle notch	**1736ST05C-1110**	12	118	71	56	45	○
11.2	3		Straight shank Zylinderschaft	**1534ST03C-1120**	12	102	55	40	45	○
	5			**1536ST05C-1120**	12	118	71	56	45	●
	5		Whistle notch	**1736ST05C-1120**	12	118	71	56	45	○
11.3	3		Straight shank Zylinderschaft	**1534ST03C-1130**	12	102	55	40	45	○
	5			**1536ST05C-1130**	12	118	71	56	45	●
	5		Whistle notch	**1736ST05C-1130**	12	118	71	56	45	○

Material Overview · Material Übersicht

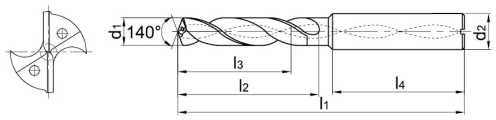
✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

Grade Sorte	Workpiece material · Werkstückstoff										
	Mild steel Baustahl HB≤180	Carbon steel, Alloy steel	Hardened steel · gehärteter Stahl			Stainless steel Rostfreier Stahl	Cast iron Gusseisen	Nodular cast iron GGG	Aluminum alloy Alu leg.	Copper alloy Kupfer leg.	Heat resist. alloy warmfest. leg.
			~40HRC	~50HRC	~60HRC						
KDG303	✔	✔				✔					✔

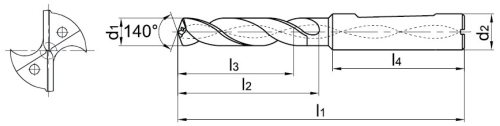
Code key C 8
ISO Kennzeichen
Cutting data 69-81
Schnittdaten
Technical Information C82-87
Technische Information
Non-standart tailor made C 89-93
Bestellformular für Sonderwerkzeuge

ST series · ST Serie for soft and stainless steel · für weichen & rostfreien Stahl









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Drill diameter Bohrer Ø $d_1(m_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen					Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	Shank length Schaftlänge	
					$d_2(h_6)$	l_1	l_2	l_3	l_4	KDG303
11.4	3	Internal · Intern	Straight shank Zylinderschaft	**1534ST03C-1140**	12	102	55	40	45	○
	5			**1536ST05C-1140**	12	118	71	56	45	●
	5		Whistle notch	**1736ST05C-1140**	12	118	71	56	45	○
11.5	3		Straight shank Zylinderschaft	**1534ST03C-1150**	12	102	55	40	45	○
	5			**1536ST05C-1150**	12	118	71	56	45	●
	5		Whistle notch	**1736ST05C-1150**	12	118	71	56	45	○
11.6	3		Straight shank Zylinderschaft	**1534ST03C-1160**	12	102	55	40	45	○
	5			**1536ST05C-1160**	12	118	71	56	45	●
	5		Whistle notch	**1736ST05C-1160**	12	118	71	56	45	○
11.7	3		Straight shank Zylinderschaft	**1534ST03C-1170**	12	102	55	40	45	○
	5			**1536ST05C-1170**	12	118	71	56	45	●
	5		Whistle notch	**1736ST05C-1170**	12	118	71	56	45	○
11.8	3		Straight shank Zylinderschaft	**1534ST03C-1180**	12	102	55	40	45	○
	5			**1536ST05C-1180**	12	118	71	56	45	●
	5		Whistle notch	**1736ST05C-1180**	12	118	71	56	45	○
11.9	3		Straight shank Zylinderschaft	**1534ST03C-1190**	12	102	55	40	45	○
	5			**1536ST05C-1190**	12	118	71	56	45	●
	5		Whistle notch	**1736ST05C-1190**	12	118	71	56	45	○
12.0	3		Straight shank Zylinderschaft	**1534ST03C-1200**	12	102	55	40	45	○
	5			**1536ST05C-1200**	12	118	71	56	45	●
	5		Whistle notch	**1736ST05C-1200**	12	118	71	56	45	○
12.20	5		Straight shank Zylinderschaft	**1536ST05C-1220**	14	124	77	60	45	●
12.25	3			**1534ST03C-1225**	14	107	60	43	45	○
	5			**1536ST05C-1225**	14	124	77	60	45	○
	5		Whistle notch	**1736ST05C-1225**	14	124	77	60	45	○
12.3	3		Straight shank Zylinderschaft	**1534ST03C-1230**	14	107	60	43	45	○
	5			**1536ST05C-1230**	14	124	77	60	45	●
	5		Whistle notch	**1736ST05C-1230**	14	124	77	60	45	○
12.5	3		Straight shank Zylinderschaft	**1534ST03C-1250**	14	107	60	43	45	○
	5			**1536ST05C-1250**	14	124	77	60	45	●
	5		Whistle notch	**1736ST05C-1250**	14	124	77	60	45	○

Drill diameter Bohrer Ø $d_1(m_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen					Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	Shank length Schaftlänge	
					$d_2(h_6)$	l_1	l_2	l_3	l_4	KDG303
12.7	3	Internal · Intern	Straight shank Zylinderschaft	1534ST03C-1270	14	107	60	43	45	○
	5		Straight shank Zylinderschaft	1536ST05C-1270	14	124	77	60	45	●
	5		Whistle notch shank · Schaft	1736ST05C-1270	14	124	77	60	45	○
12.75	3		Straight shank Zylinderschaft	1534ST03C-1275	14	107	60	43	45	○
	5		Straight shank Zylinderschaft	1536ST05C-1275	14	124	77	60	45	○
	5		Whistle notch shank · Schaft	1736ST05C-1275	14	124	77	60	45	○
12.8	3		Straight shank Zylinderschaft	1534ST03C-1280	14	107	60	43	45	○
	5		Straight shank Zylinderschaft	1536ST05C-1280	14	124	77	60	45	●
	5		Whistle notch shank · Schaft	1736ST05C-1280	14	124	77	60	45	○
13.0	3		Straight shank Zylinderschaft	1534ST03C-1300	14	107	60	43	45	○
	5		Straight shank Zylinderschaft	1536ST05C-1300	14	124	77	60	45	●
	5		Whistle notch shank · Schaft	1736ST05C-1300	14	124	77	60	45	○
13.1	3		Straight shank Zylinderschaft	1534ST03C-1310	14	107	60	43	45	○
	5		Straight shank Zylinderschaft	1536ST05C-1310	14	124	77	60	45	●
	5		Whistle notch shank · Schaft	1736ST05C-1310	14	124	77	60	45	○
13.5	3		Straight shank Zylinderschaft	1534ST03C-1350	14	107	60	43	45	○
	5		Straight shank Zylinderschaft	1536ST05C-1350	14	124	77	60	45	●
	5		Whistle notch shank · Schaft	1736ST05C-1350	14	124	77	60	45	○
13.8	3		Straight shank Zylinderschaft	1534ST03C-1380	14	107	60	43	45	○
	5		Straight shank Zylinderschaft	1536ST05C-1380	14	124	77	60	45	●
	5		Whistle notch shank · Schaft	1736ST05C-1380	14	124	77	60	45	○
14.0	3		Straight shank Zylinderschaft	1534ST03C-1400	14	107	60	43	45	○
	5		Straight shank Zylinderschaft	1536ST05C-1400	14	124	77	60	45	●
	5		Whistle notch shank · Schaft	1736ST05C-1400	14	124	77	60	45	○
14.25	3		Straight shank Zylinderschaft	1534ST03C-1425	16	115	65	45	48	○
	5		Straight shank Zylinderschaft	1536ST05C-1425	16	133	83	63	48	○
	5		Whistle notch shank · Schaft	1736ST05C-1425	16	133	83	63	48	○
14.3	3		Straight shank Zylinderschaft	1534ST03C-1430	16	115	65	45	48	○
	5		Straight shank Zylinderschaft	1536ST05C-1430	16	133	83	63	48	●
	5		Whistle notch shank · Schaft	1736ST05C-1430	16	133	83	63	48	○
14.5	3		Straight shank Zylinderschaft	1534ST03C-1450	16	115	65	45	48	○
	5		Straight shank Zylinderschaft	1536ST05C-1450	16	133	83	63	48	●
	5		Whistle notch shank · Schaft	1736ST05C-1450	16	133	83	63	48	○
14.75	3		Straight shank Zylinderschaft	1534ST03C-1475	16	115	65	45	48	○
	5		Straight shank Zylinderschaft	1536ST05C-1475	16	133	83	63	48	○
	5		Whistle notch shank · Schaft	1736ST05C-1475	16	133	83	63	48	○

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Material Overview · Material Übersicht

Grade Sorte	Workpiece material · Werkstückstoff										
	Mild steel Baustahl HB≤180	Carbon steel, Alloy steel	Hardened steel · gehärteter Stahl			Stainless steel Rostfreier Stahl	Cast iron Gusseisen	Nodular cast iron GGG	Aluminum alloy Alu leg.	Copper alloy Kupfer leg.	Heat resist. alloy warmfest. leg.
			~40HRC	~50HRC	~60HRC						
KDG303	✔	✔				✔					✔

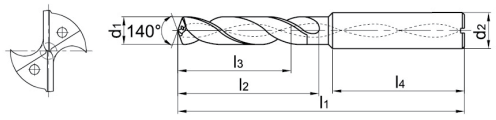
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ISO Kennzeichen
Cutting data 69-81
Schnittdaten
Technical Information C82-87
Technische Information
Non-standart tailor made C 89-93
Bestellformular für Sonderwerkzeuge

ST series · ST Serie for soft and stainless steel · für weichen & rostfreien Stahl



Internal Coolant
Interne Kühlung

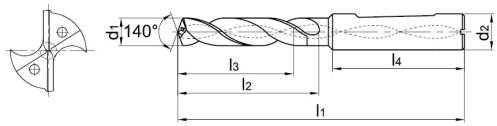
Straight shank
Zylinderschaft





Internal Coolant
Interne Kühlung

Whistle notch
shank · Schaft



- First choice for drilling soft & stainless steel.
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- Erste Wahl für das Bohren von weichen und rostfreien Stählen.
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Drill diameter Bohrer Ø $d_1(m_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen					Grade Sorte
					Shank Ø Schaft Ø	Overall length	Flute length	Recommended drilling depth	Shank length	
					$d_2(h_6)$	l_1	l_2	l_3	l_4	KDG303
14.8	3	Internal · Intern	Straight shank Zylinderschaft	**1534ST03C-1480**	16	115	65	45	48	○
	5			**1536ST05C-1480**	16	133	83	63	48	●
	5		Whistle notch	**1736ST05C-1480**	16	133	83	63	48	○
15.0	3		Straight shank Zylinderschaft	**1534ST03C-1500**	16	115	65	45	48	○
	5			**1536ST05C-1500**	16	133	83	63	48	●
	5		Whistle notch	**1736ST05C-1500**	16	133	83	63	48	○
15.1	3		Straight shank Zylinderschaft	**1534ST03C-1510**	16	115	65	45	48	○
	5			**1536ST05C-1510**	16	133	83	63	48	●
	5		Whistle notch	**1736ST05C-1510**	16	133	83	63	48	○
15.5	3		Straight shank Zylinderschaft	**1534ST03C-1550**	16	115	65	45	48	○
	5			**1536ST05C-1550**	16	133	83	63	48	●
	5		Whistle notch	**1736ST05C-1550**	16	133	83	63	48	○
15.8	3		Straight shank Zylinderschaft	**1534ST03C-1580**	16	115	65	45	48	○
	5			**1536ST05C-1580**	16	133	83	63	48	●
	5		Whistle notch	**1736ST05C-1580**	16	133	83	63	48	○
16.0	3		Straight shank Zylinderschaft	**1534ST03C-1600**	16	115	65	45	48	○
	5			**1536ST05C-1600**	16	133	83	63	48	●
	5		Whistle notch	**1736ST05C-1600**	16	133	83	63	48	○
16.5	3		Straight shank Zylinderschaft	**1534ST03C-1650**	18	123	73	51	48	○
	5			**1536ST05C-1650**	18	143	93	71	48	●
	5		Whistle notch	**1736ST05C-1650**	18	143	93	71	48	○
16.75	3		Straight shank Zylinderschaft	**1534ST03C-1675**	18	123	73	51	48	○
	5			**1536ST05C-1675**	18	143	93	71	48	○
	5		Whistle notch	**1736ST05C-1675**	18	143	93	71	48	○
16.8	3		Straight shank Zylinderschaft	**1534ST03C-1680**	18	123	73	51	48	○
	5			**1536ST05C-1680**	18	143	93	71	48	●
	5		Whistle notch	**1736ST05C-1680**	18	143	93	71	48	○
17.0	3		Straight shank Zylinderschaft	**1534ST03C-1700**	18	123	73	51	48	○
	5			**1536ST05C-1700**	18	143	93	71	48	●
	5		Whistle notch	**1736ST05C-1700**	18	143	93	71	48	○

Drill diameter Bohrer Ø $d_1(m_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen					Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	Shank length Schaftlänge	
					$d_2(h_6)$	l_1	l_2	l_3	l_4	KDG303
17.5	3	Internal · Intern	Straight shank Zylinderschaft	**1534ST03C-1750**	18	123	73	51	48	○
	5			**1536ST05C-1750**	18	143	93	71	48	●
	5		Whistle notch shank · Schaft	**1736ST05C-1750**	18	143	93	71	48	○
17.8	3		Straight shank Zylinderschaft	**1534ST03C-1780**	18	123	73	51	48	○
	5			**1536ST05C-1780**	18	143	93	71	48	●
	5		Whistle notch shank · Schaft	**1736ST05C-1780**	18	143	93	71	48	○
18.0	3		Straight shank Zylinderschaft	**1534ST03C-1800**	18	123	73	51	48	○
	5			**1536ST05C-1800**	18	143	93	71	48	●
	5		Whistle notch shank · Schaft	**1736ST05C-1800**	18	143	93	71	48	○
18.5	3		Straight shank Zylinderschaft	**1534ST03C-1850**	20	131	79	55	50	○
	5			**1536ST05C-1850**	20	153	101	77	50	●
	5		Whistle notch shank · Schaft	**1736ST05C-1850**	20	153	101	77	50	○
18.8	3		Straight shank Zylinderschaft	**1534ST03C-1880**	20	131	79	55	50	○
	5			**1536ST05C-1880**	20	153	101	77	50	●
	5		Whistle notch shank · Schaft	**1736ST05C-1880**	20	153	101	77	50	○
19.0	3		Straight shank Zylinderschaft	**1534ST03C-1900**	20	131	79	55	50	○
	5			**1536ST05C-1900**	20	153	101	77	50	●
	5		Whistle notch shank · Schaft	**1736ST05C-1900**	20	153	101	77	50	○
19.5	3		Straight shank Zylinderschaft	**1534ST03C-1950**	20	131	79	55	50	○
	5			**1536ST05C-1950**	20	153	101	77	50	●
	5		Whistle notch shank · Schaft	**1736ST05C-1950**	20	153	101	77	50	○
19.8	3		Straight shank Zylinderschaft	**1534ST03C-1980**	20	131	79	55	50	○
	5			**1536ST05C-1980**	20	153	101	77	50	●
	5		Whistle notch shank · Schaft	**1736ST05C-1980**	20	153	101	77	50	○
20.0	3		Straight shank Zylinderschaft	**1534ST03C-2000**	20	131	79	55	50	○
	5			**1536ST05C-2000**	20	153	101	77	50	●
	5		Whistle notch shank · Schaft	**1736ST05C-2000**	20	153	101	77	50	○

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

Grade Sorte	Workpiece material · Werkstückstoff										
	Mild steel Baustahl HB≤180	Carbon steel, Alloy steel	Hardened steel · gehärteter Stahl			Stainless steel Rostfreier Stahl	Cast iron Gusseisen	Nodular cast iron GGG	Aluminum alloy Alu leg.	Copper alloy Kupfer leg.	Heat resist. alloy warmfest. leg.
			~40HRC	~50HRC	~60HRC						
KDG303	✔	✔				✔					✔

Code key C 8
ISO Kennzeichen
Cutting data 69-81
Schnittdaten
Technical Information C82-87
Technische Information
Non-standart tailor made C 89-93
Bestellformular für Sonderwerkzeuge

SH series twist drill
Spiralbohrer Serie

For high hardness steel
Für gehärteten Stahl



- Uniquely designed chip-breakers and treated with high performance coating render to the drills high rigidity and durability. Especially suitable for the machining of heat treated materials (hardness up to HRC=40-60) and high strength steel (tensile strength 1500N/mm^2).
- Speziell entwickelte Spangeometrie in Verbindung mit einer Hochleistungsbeschichtung gibt dem Bohrer die entsprechende Voraussetzung zum Zerspanen von gehärteten Stahl und von hochvergütetem Stahl (Zugfestigkeit 1500N/mm^2) und (HRC=40-60).

Type · Typ: 1534SH03-1000

Size/Durchmesser: Ø10.0mm

Workpiece material
Werkstückstoff: S136 (53HRC)

Rotating speed
Umdrehung pro min: 800r/min

Cutting speed
Schnittgeschwindigkeit: 25m/min

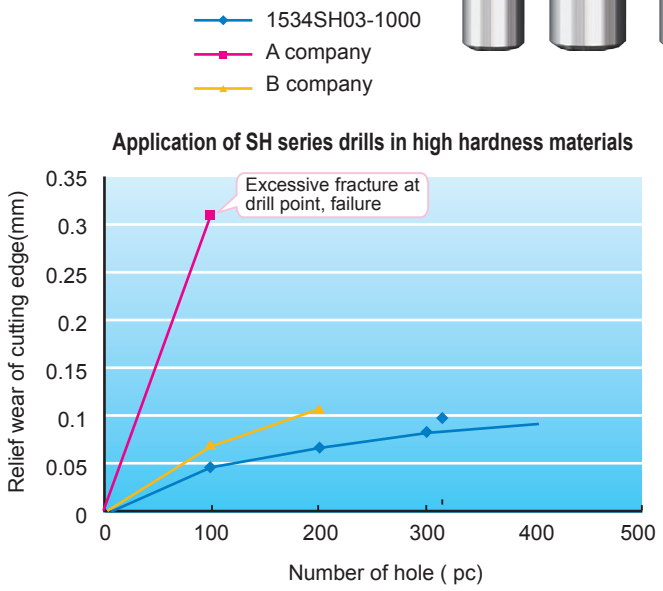
Feed rate per revolution
Vorschub pro Umdrehung: 0.08mm/r

Feed speed
Vorschub: 64mm/r

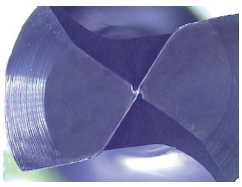
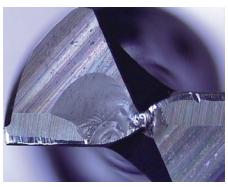
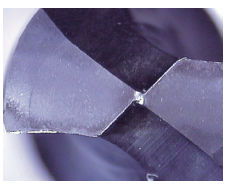
Drilling depth
Bohrtiefe: 20mm (blind hole)

Cooling system: water-soluble liquid
Kühlmittel.: Emulsion

Machine Maschine: MIKRON UCP 1000



■ **Drill wear status in machining process · Abb.: Verschleiß nach der Bearbeitung**

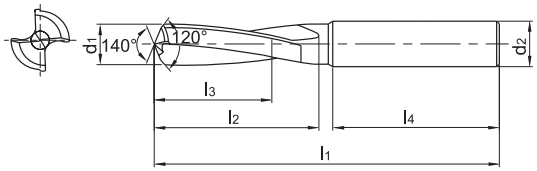
Drill/ Bohrer	ZCC 1534SH03-1000	Similar product of company A Vergleichbares Produkt A	Similar product of company B Vergleichbares Produkt B
Number of hole (pc) Bohrungen	400	100	200
Wear value Verschleißmarkenbreite	0.08 mm	Wear 0.31mm fracture 2.59 mm	0.108 mm
Wear Verschleiß			

SH series · SH Serie for high hardness steel · für die Hartbearbeitung



External Coolant
Externe Kühlung

Straight shank
Zylinderschaft



- For drilling high hardness steel (HRC 40~60) and higher tensile strength.
- Small helical angle and large core designed, greatly improve tool rigidity.
- Bohren von gehärteten Stählen (HRC 40-60) und Stählen mit hoher Zugfestigkeit.
- Kleiner Spiralwinkel und größerer Kerndurchmesser (Seele). Erhöht die Werkzeugstabilität deutlich.

Drill diameter Bohrer Ø $d_1(m_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen					Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	Shank length Schaftlänge	
					$d_2(h_6)$	l_1	l_2	l_3	l_4	KDG303
3.0	3	External · Extern	Straight shank Zylinder-schaft	**1534SH03-0300**	6	62	20	14	36	○
3.3	3			**1534SH03-0330**	6	62	20	14	36	○
4.0	3			**1534SH03-0400**	6	66	24	17	36	○
4.2	3			**1534SH03-0420**	6	66	24	17	36	○
5.0	3			**1534SH03-0500**	6	66	28	20	36	○
6.0	3			**1534SH03-0600**	6	66	28	20	36	○
6.75	3			**1534SH03-0675**	8	79	34	24	36	○
7.0	3			**1534SH03-0700**	8	79	34	24	36	○
8.0	3			**1534SH03-0800**	8	79	41	29	36	○
8.5	3			**1534SH03-0850**	10	89	47	35	40	○
9.0	3			**1534SH03-0900**	10	89	47	35	40	○
10.0	3			**1534SH03-1000**	10	89	47	35	40	○
10.25	3			**1534SH03-1025**	12	102	55	40	45	○
10.5	3			**1534SH03-1050**	12	102	55	40	45	○
12.0	3			**1534SH03-1200**	12	102	55	40	45	○
12.5	3			**1534SH03-1250**	14	107	60	43	45	○
14.0	3			**1534SH03-1400**	14	107	60	43	45	○
14.5	3			**1534SH03-1450**	16	115	65	45	48	○
16.0	3			**1534SH03-1600**	16	115	65	45	48	○

● ex Stock Lager · ab Lager ○ on demand · auf Anfrage

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

Grade	Workpiece material										
	Mild steel Baustahl HB≤180	Carbon steel, Alloy steel	Hardened steel · gehärteter Stahl			Stainless steel Rostfreier Stahl	Cast iron Gusseisen	Nodular cast iron GGG	Aluminum alloy Alu-leg.	Copper alloy Kupfer leg.	Heat resist. alloy warmfest. leg.
			~40HRC	~50HRC	~60HRC						
KDG303				✔	✔						

Code key C 8
ISO Kennzeichen

Cutting data 69-81
Schnittdaten

Technical Information C82-87
Technische Information

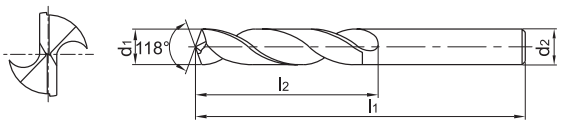
Non-standart tailor made C 89-93
Bestellformular für Sonderwerkzeuge

SC series · SC Serie for cast iron & AL alloy · für Grauguss & Alu Legierungen



External Coolant
Externe Kühlung

Straight shank
Zylinderschaft



- For materials with short chips such as cast iron, silicon-aluminum alloy etc.
- Cutting edge and shank with same diameter.
- Zur Bearbeitung von kurzspanenden Werkstoffen.
- Gleicher Schneiden und Schaftdurchmesser.

Drill diameter $d_1(h_8)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen			Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	
					$d_2(h_7)$	l_1	l_2	YK20F
2.00	3	External · Extern	Straight shank Zylinder-schaft	**1105SC03-0200**	2.0	38	12	○
	5			**1101SC05-0200**	2.0	49	24	○
2.5	3			**1105SC03-0250**	2.5	43	14	○
	5			**1101SC05-0250**	2.5	57	30	○
2.8	3			**1105SC03-0280**	2.8	46	16	○
	5			**1101SC05-0280**	2.8	61	33	○
3.0	3			**1105SC03-0300**	3.0	46	16	○
	5			**1101SC05-0300**	3.0	61	33	○
3.1	3			**1105SC03-0310**	3.1	49	18	○
3.2	3			**1105SC03-0320**	3.2	49	18	○
3.3	3			**1105SC03-0330**	3.3	49	18	○
3.4	3			**1105SC03-0340**	3.4	52	20	○
3.5	3			**1105SC03-0350**	3.5	52	20	○
	5			**1101SC05-0350**	3.5	70	39	○
3.6	3			**1105SC03-0360**	3.6	52	20	○
3.7	3			**1105SC03-0370**	3.7	52	20	○
3.8	3			**1105SC03-0380**	3.8	55	22	○
	5			**1101SC05-0380**	3.8	75	43	○
3.9	3			**1105SC03-0390**	3.9	55	22	○
4.0	3			**1105SC03-0400**	4.0	55	22	○
	5			**1101SC05-0400**	4.0	75	43	○
4.1	3			**1105SC03-0410**	4.1	55	22	○
4.2	3			**1105SC03-0420**	4.2	55	22	○
	5			**1101SC05-0420**	4.2	75	43	○
4.3	3			**1105SC03-0430**	4.3	58	24	○
4.4	3			**1105SC03-0440**	4.4	58	24	○
4.5	3			**1105SC03-0450**	4.5	58	24	○
	5			**1101SC05-0450**	4.5	80	47	○
4.6	3			**1105SC03-0460**	4.6	58	24	○
4.7	3			**1105SC03-0470**	4.7	58	24	○
4.8	3			**1105SC03-0480**	4.8	62	26	○
	5			**1101SC05-0480**	4.8	86	52	○
4.9	3			**1105SC03-0490**	4.9	62	26	○

Drill diameter $d_1(h_8)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen			Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	
					$d_2(h_7)$	l_1	l_2	YK20F
5.0	3	External · Extern	Straight shank Zylinder-schaft	**1105SC03-0500**	5.0	62	26	○
	5			**1101SC05-0500**	5.0	86	52	○
5.1	3			**1105SC03-0510**	5.1	62	26	○
5.2	3			**1105SC03-0520**	5.2	62	26	○
5.3	3			**1105SC03-0530**	5.3	62	26	○
5.4	3			**1105SC03-0540**	5.4	66	28	○
5.5	3			**1105SC03-0550**	5.5	66	28	○
	5			**1101SC05-0550**	5.5	93	57	○
5.6	3			**1105SC03-0560**	5.6	66	28	○
5.7	3			**1105SC03-0570**	5.7	66	28	○
5.8	3			**1105SC03-0580**	5.8	66	28	○
	5			**1101SC05-0580**	5.8	93	57	○
5.9	3			**1105SC03-0590**	5.9	66	28	○
6.0	3			**1105SC03-0600**	6.0	66	28	○
	5			**1101SC05-0600**	6.0	93	57	○
6.1	3			**1105SC03-0610**	6.1	70	31	○
6.2	3			**1105SC03-0620**	6.2	70	31	○
6.3	3			**1105SC03-0630**	6.3	70	31	○
6.4	3			**1105SC03-0640**	6.4	70	31	○
6.5	3			**1105SC03-0650**	6.5	70	31	○
	5			**1101SC05-0650**	6.5	101	63	○
6.6	3			**1105SC03-0660**	6.6	70	31	○
6.7	3			**1105SC03-0670**	6.7	70	31	○
6.8	3			**1105SC03-0680**	6.8	74	34	○
	5			**1101SC05-0680**	6.8	109	69	○
6.9	3			**1105SC03-0690**	6.9	74	34	○
7.0	3			**1105SC03-0700**	7.0	74	34	○
	5			**1101SC05-0700**	7.0	109	69	○
7.1	3			**1105SC03-0710**	7.1	74	34	○
7.2	3			**1105SC03-0720**	7.2	74	34	○
7.3	3			**1105SC03-0730**	7.3	74	34	○
7.4	3			**1105SC03-0740**	7.4	74	34	○

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

Grade	Workpiece material · Werkstückstoff										
	Mild steel Baustahl HB≤180	Carbon steel, Alloy steel	Hardened steel · gehärteter Stahl			Stainless steel Rostfreier Stahl	Cast iron	Nodular cast iron GGG	Aluminum alloy Alu-leg.	Copper alloy Kupfer leg.	Heat resist. alloy warmfest. leg.
			~40HRC	~50HRC	~60HRC						
YK20F							✔	✔	✔		

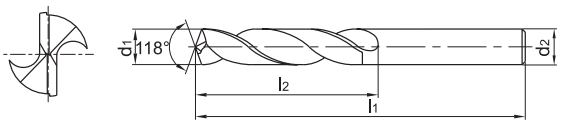
Code key C 8
ISO Kennzeichen
Cutting data 69-81
Schnittdaten
Technical Information C82-87
Technische Information
Non-standart tailor made C 89-93
Bestellformular für Sonderwerkzeuge

SC series · SC Serie for cast iron, AL alloy · für Grauguss Alu Legierungen



External Coolant
Externe Kühlung

Straight shank
Zylinderschaft



- For materials with short chips such as cast iron, silicon-aluminum alloy etc.
- Cutting edge and shank with same diameter.
- Zur Bearbeitung von kurzspanenden Werkstoffen.
- Gleicher Schneiden und Schaftdurchmesser.

Drill diameter $d_1(h_8)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen			Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	
					$d_2(h_7)$	l_1	l_2	YK20F
7.5	3	External · Extern	Straight shank Zylinder-schaft	**1105SC03-0750**	7.5	74	34	○
	5			**1101SC05-0750**	7.5	109	69	○
7.6	3			**1105SC03-0760**	7.6	79	37	○
7.7	3			**1105SC03-0770**	7.7	79	37	○
7.8	3			**1105SC03-0780**	7.8	79	37	○
	5			**1101SC05-0780**	7.8	117	75	○
7.9	3			**1105SC03-0790**	7.9	79	37	○
8.0	3			**1105SC03-0800**	8.0	79	37	○
	5			**1101SC05-0800**	8.0	117	75	○
8.1	3			**1105SC03-0810**	8.1	79	37	○
8.2	3			**1105SC03-0820**	8.2	79	37	○
8.3	3			**1105SC03-0830**	8.3	79	37	○
8.4	3			**1105SC03-0840**	8.4	79	37	○
8.5	3			**1105SC03-0850**	8.5	79	37	○
	5			**1101SC05-0850**	8.5	117	75	○
8.6	3			**1105SC03-0860**	8.6	84	40	○
8.7	3			**1105SC03-0870**	8.7	84	40	○
8.8	3			**1105SC03-0880**	8.8	84	40	○
	5			**1101SC05-0880**	8.8	125	81	○
8.9	3			**1105SC03-0890**	8.9	84	40	○
9.0	3			**1105SC03-0900**	9.0	84	40	○
	5			**1101SC05-0900**	9.0	125	81	○
9.1	3			**1105SC03-0910**	9.1	84	40	○
9.2	3			**1105SC03-0920**	9.2	84	40	○
9.3	3			**1105SC03-0930**	9.3	84	40	○
9.4	3			**1105SC03-0940**	9.4	84	40	○
9.5	3			**1105SC03-0950**	9.5	84	40	○
	5			**1101SC05-0950**	9.5	125	81	○
9.6	3			**1105SC03-0960**	9.6	89	43	○
9.7	3			**1105SC03-0970**	9.7	89	43	○
9.8	3			**1105SC03-0980**	9.8	89	43	○
	5			**1101SC05-0980**	9.8	133	87	○
9.9	3			**1105SC03-0990**	9.9	89	43	○

Drill diameter $d_1(h_8)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen			Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	
					d_2 (h_7)	l_1	l_2	YK20F
10.0	3	External · Extern	Straight shank Zylinder-schaft	**1105SC03-1000**	10.0	89	43	○
	5			**1101SC05-1000**	10.0	133	87	○
10.1	3			**1105SC03-1010**	10.1	89	43	○
10.2	3			**1105SC03-1020**	10.2	89	43	○
10.4	3			**1105SC03-1040**	10.4	89	43	○
10.5	3			**1105SC03-1050**	10.5	89	43	○
	5			**1101SC05-1050**	10.5	133	87	○
10.7	3			**1105SC03-1070**	10.7	95	47	○
10.8	3			**1105SC03-1080**	10.8	95	47	○
	5			**1101SC05-1080**	10.8	142	94	○
11.0	3			**1105SC03-1100**	11.0	95	47	○
	5			**1101SC05-1100**	11.0	142	94	○
11.5	3			**1105SC03-1150**	11.5	95	47	○
	5			**1101SC05-1150**	11.5	142	94	○
12.0	3			**1105SC03-1200**	12.0	102	51	○
	5			**1101SC05-1200**	12.0	151	101	○
12.5	3			**1105SC03-1250**	12.5	102	51	○
	5			**1101SC05-1250**	12.5	151	101	○
12.8	3			**1105SC03-1280**	12.8	102	51	○
13.0	3			**1105SC03-1300**	13.0	102	51	○
	5			**1101SC05-1300**	13.0	151	101	○
13.1	3			**1105SC03-1310**	13.1	102	51	○
13.5	3			**1105SC03-1350**	13.5	107	54	○
	5			**1101SC05-1350**	13.5	160	108	○
14.0	3			**1105SC03-1400**	14.0	107	54	○
	5			**1101SC05-1400**	14.0	160	108	○
14.3	3			**1105SC03-1430**	14.3	111	56	○
14.5	3			**1105SC03-1450**	14.5	111	56	○
	5			**1101SC05-1450**	14.5	169	114	○
15.0	3			**1105SC03-1500**	15.0	111	56	○
	5			**1101SC05-1500**	15.0	169	114	○
15.5	5			**1101SC05-1550**	15.5	178	120	○
16.0	3			**1105SC03-1600**	16.0	115	58	○
	5			**1101SC05-1600**	16.0	178	120	○

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

Grade	Workpiece material										
	Mild steel Baustahl HB≤180	Carbon steel, Alloy steel	Hardened steel · gehärteter Stahl			Stainless steel Rostfreier Stahl	Cast iron Gusseisen	Nodular cast iron GGG	Aluminum alloy Alu-leg.	Copper alloy Kupfer leg.	Heat resist. alloy warmfest. leg.
			~40HRC	~50HRC	~60HRC						
YK20F							✔	✔	✔		

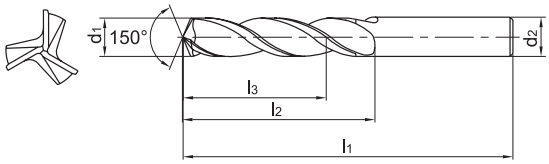
Code key C 8
ISO Kennzeichen
Cutting data 69-81
Schnittdaten
Technical Information C82-87
Technische Information
Non-standart tailor made C 89-93
Bestellformular für Sonderwerkzeuge

PA series · PA Serie for cast iron, AL alloy · für Grauguss Alu Legierungen



External Coolant
Externe Kühlung

Straight shank
Zylinderschaft



- For drilling solid workpiece composed of cast iron or Al alloy etc.
- Three-lips structure can achieve high feed rate and prominent centering capability.
- High machining reliability, suitable for poor conditions such as interrupted cutting.

- Bohren von stabilen Werkstücken aus Grauguss oder Alu-Legierungen.
- 3-Lippen-Bohrerform ist besonders geeignet für hohe Vorschübe.
- Hohe Bearbeitungssicherheit auch bei ungünstigen Bedingungen (z.B. unterbrochenem Schnitt)

Drill diameter $d_1(h_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen				Grade · Sorte	
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	KDG303	YK30F
					$d_2(h_7)$	l_1	l_2	l_3		
3.0	3	External · Extern	Straight shank Zylinder-schaft	**1165PA03-0300**	3.0	46	16	12	○	○
3.1	3			**1165PA03-0310**	3.1	49	18	14	○	○
3.2	3			**1165PA03-0320**	3.2	49	18	14	○	○
3.3	3			**1165PA03-0330**	3.3	49	18	14	○	○
3.4	3			**1165PA03-0340**	3.4	52	20	15	○	○
3.5	3			**1165PA03-0350**	3.5	52	20	15	○	○
3.6	3			**1165PA03-0360**	3.6	52	20	15	○	○
3.7	3			**1165PA03-0370**	3.7	52	20	15	○	○
3.8	3			**1165PA03-0380**	3.8	55	22	17	○	○
3.9	3			**1165PA03-0390**	3.9	55	22	17	○	○
4.0	3			**1165PA03-0400**	4.0	55	22	17	○	○
4.1	3			**1165PA03-0410**	4.1	55	22	17	○	○
4.2	3			**1165PA03-0420**	4.2	55	22	17	○	○
4.3	3			**1165PA03-0430**	4.3	58	24	18	○	○
4.4	3			**1165PA03-0440**	4.4	58	24	18	○	○
4.5	3			**1165PA03-0450**	4.5	58	24	18	○	○
4.6	3			**1165PA03-0460**	4.6	58	24	18	○	○
4.7	3			**1165PA03-0470**	4.7	58	24	18	○	○
4.8	3			**1165PA03-0480**	4.8	62	26	20	○	○
4.9	3			**1165PA03-0490**	4.9	62	26	20	○	○
5.0	3			**1165PA03-0500**	5.0	62	26	20	○	○
5.1	3			**1165PA03-0510**	5.1	62	26	20	○	○
5.2	3			**1165PA03-0520**	5.2	62	26	20	○	○
5.3	3			**1165PA03-0530**	5.3	62	26	20	○	○
5.4	3			**1165PA03-0540**	5.4	66	28	21	○	○
5.5	3			**1165PA03-0550**	5.5	66	28	21	○	○
5.6	3			**1165PA03-0560**	5.6	66	28	21	○	○
5.7	3			**1165PA03-0570**	5.7	66	28	21	○	○
5.8	3			**1165PA03-0580**	5.8	66	28	21	○	○
5.9	3			**1165PA03-0590**	5.9	66	28	21	○	○
6.0	3			**1165PA03-0600**	6.0	66	28	21	○	○
6.1	3			**1165PA03-0610**	6.1	70	31	23	○	○
6.2	3			**1165PA03-0620**	6.2	70	31	23	○	○

Drill diameter $d_1(h_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen				Grade · Sorte	
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	KDG303	YK30F
					$d_2(h_7)$	l_1	l_2	l_3		
6.3	3	External · Extern	Straight shank Zylinder-schaft	**1165PA03-0630**	6.3	70	31	23	○	○
6.4	3			**1165PA03-0640**	6.4	70	31	23	○	○
6.5	3			**1165PA03-0650**	6.5	70	31	23	○	○
6.6	3			**1165PA03-0660**	6.6	70	31	23	○	○
6.7	3			**1165PA03-0670**	6.7	70	31	23	○	○
6.8	3			**1165PA03-0680**	6.8	74	34	25	○	○
6.9	3			**1165PA03-0690**	6.9	74	34	25	○	○
7.0	3			**1165PA03-0700**	7.0	74	34	25	○	○
7.1	3			**1165PA03-0710**	7.1	74	34	25	○	○
7.2	3			**1165PA03-0720**	7.2	74	34	25	○	○
7.3	3			**1165PA03-0730**	7.3	74	34	25	○	○
7.4	3			**1165PA03-0740**	7.4	74	34	25	○	○
7.5	3			**1165PA03-0750**	7.5	74	34	25	○	○
7.6	3			**1165PA03-0760**	7.6	79	37	27	○	○
7.7	3			**1165PA03-0770**	7.7	79	37	27	○	○
7.8	3			**1165PA03-0780**	7.8	79	37	27	○	○
7.9	3			**1165PA03-0790**	7.9	79	37	27	○	○
8.0	3			**1165PA03-0800**	8.0	79	37	27	○	○
8.1	3			**1165PA03-0810**	8.1	79	37	27	○	○
8.2	3			**1165PA03-0820**	8.2	79	37	27	○	○
8.3	3			**1165PA03-0830**	8.3	79	37	27	○	○
8.4	3			**1165PA03-0840**	8.4	79	37	27	○	○
8.5	3			**1165PA03-0850**	8.5	79	37	27	○	○
8.6	3			**1165PA03-0860**	8.6	84	40	29	○	○
8.7	3			**1165PA03-0870**	8.7	84	40	29	○	○
8.8	3			**1165PA03-0880**	8.8	84	40	29	○	○
8.9	3			**1165PA03-0890**	8.9	84	40	29	○	○
9.0	3			**1165PA03-0900**	9.0	84	40	29	○	○
9.1	3			**1165PA03-0910**	9.1	84	40	29	○	○
9.2	3			**1165PA03-0920**	9.2	84	40	29	○	○
9.3	3			**1165PA03-0930**	9.3	84	40	29	○	○
9.4	3			**1165PA03-0940**	9.4	84	40	29	○	○
9.5	3			**1165PA03-0950**	9.5	84	40	29	○	○
9.6	3			**1165PA03-0960**	9.6	89	43	31	○	○
9.7	3			**1165PA03-0970**	9.7	89	43	31	○	○
9.8	3			**1165PA03-0980**	9.8	89	43	31	○	○

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

Grade Sorte	Workpiece material · Werkstückstoff										
	Mild steel Baustahl HB≤180	Carbon steel, Alloy steel	Hardened steel · gehärteter Stahl			Stainless steel Rostfreier Stahl	Cast iron Gusseisen	Nodular cast iron GGG	Aluminum alloy Alu leg.	Copper alloy Kupfer leg.	Heat resist. alloy warmfest. leg.
			~40HRC	~50HRC	~60HRC						
KDG303						✔	✔	✔	✔		✔
YK30F						✔	✔	✔	✔		✔

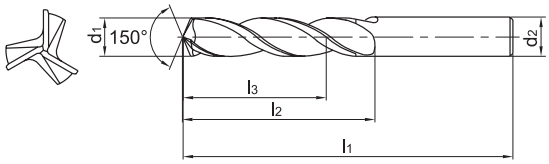
Code key C 8
ISO Kennzeichen
Cutting data 69-81
Schnittdaten
Technical Information C82-87
Technische Information
Non-standart tailor made C 89-93
Bestellformular für Sonderwerkzeuge

PA series · PA Serie for cast iron, AL alloy · für Grauguss Alu Legierungen



External Coolant
Externe Kühlung

Straight shank
Zylinderschaft



- For drilling solid workpiece composed of cast iron or Al alloy etc.
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Drill diameter $d_1(h_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen				Grade · Sorte	
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	KDG303	YK30F
					$d_2(h_7)$	l_1	l_2	l_3		
9.9	3	External · Extern	Straight shank Zylinder-schaft	**1165PA03-0990**	9.9	89	43	31	○	○
10.0	3			**1165PA03-1000**	10.0	89	43	31	○	○
10.1	3			**1165PA03-1010**	10.1	89	43	31	○	○
10.2	3			**1165PA03-1020**	10.2	89	43	31	○	○
10.3	3			**1165PA03-1030**	10.3	89	43	31	○	○
10.5	3			**1165PA03-1050**	10.5	89	43	31	○	○
11.0	3			**1165PA03-1100**	11.0	95	47	33	○	○
11.2	3			**1165PA03-1120**	11.2	95	47	33	○	○
11.5	3			**1165PA03-1150**	11.5	95	47	33	○	○
11.8	3			**1165PA03-1180**	11.8	95	47	33	○	○
12.0	3			**1165PA03-1200**	12.0	102	51	35	○	○
12.1	3			**1165PA03-1210**	12.1	102	51	35	○	○
12.5	3			**1165PA03-1250**	12.5	102	51	35	○	○
13.0	3			**1165PA03-1300**	13.0	102	51	35	○	○
13.5	3			**1165PA03-1350**	13.5	107	54	37	○	○
14.0	3			**1165PA03-1400**	14.0	107	54	37	○	○
14.5	3			**1165PA03-1450**	14.5	111	56	38	○	○
15.0	3			**1165PA03-1500**	15.0	111	56	38	○	○
15.5	3			**1165PA03-1550**	15.5	115	58	38	○	○
16.0	3			**1165PA03-1600**	16.0	115	58	38	○	○
16.5	3			**1165PA03-1650**	16.5	119	60	39	○	○
17.0	3			**1165PA03-1700**	17.0	119	60	39	○	○
17.5	3			**1165PA03-1750**	17.5	123	62	40	○	○
18.0	3			**1165PA03-1800**	18.0	123	62	40	○	○
18.5	3			**1165PA03-1850**	18.5	127	64	41	○	○
19.0	3			**1165PA03-1900**	19.0	127	64	41	○	○
19.5	3			**1165PA03-1950**	19.5	131	66	42	○	○
20.0	3			**1165PA03-2000**	20.0	131	66	42	○	○

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

Material Overview · Material Übersicht

Grade	Workpiece material · Werkstückstoff										
	Mild steel Baustahl HB≤180	Carbon steel, Alloy steel	Hardened steel · gehärteter Stahl			Stainless steel Rostfreier Stahl	Cast iron Gusseisen	Nodular cast iron GGG	Aluminum alloy Alu-leg.	Copper alloy Kupfer leg.	Heat resist. alloy warmfest. leg.
			~40HRC	~50HRC	~60HRC						
KDG303						✔	✔	✔	✔		✔
YK30F						✔	✔	✔	✔		✔

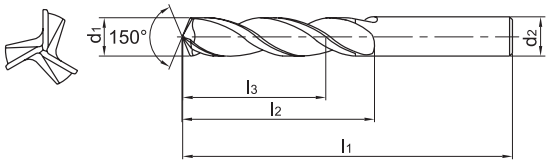
● ex Stock Lager ○ on demand · auf Anfrage

PC series · PC Serie for cast iron· für Grauguss



External Coolant
Externe Kühlung

Straight shank
Zylinderschaft



- For drilling solid workpiece composed of cast iron or Al alloy etc.
- Three-lips structure can achieve high feed rate and prominent centering capability.
- High machining reliability, suitable for poor conditions such as interrupted cutting.

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Drill diameter $d_1(h_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen				Grade · Sorte	
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	KDG303	YK30F
					$d_2(h_7)$	l_1	l_2	l_3		
3.0	3	External · Extern	Straight shank Zylinder-schaft	**1165PC03-0300**	3.0	46	16	12	○	○
3.1	3			**1165PC03-0310**	3.1	49	18	14	○	○
3.2	3			**1165PC03-0320**	3.2	49	18	14	○	○
3.3	3			**1165PC03-0330**	3.3	49	18	14	○	○
3.4	3			**1165PC03-0340**	3.4	52	20	15	○	○
3.5	3			**1165PC03-0350**	3.5	52	20	15	○	○
3.6	3			**1165PC03-0360**	3.6	52	20	15	○	○
3.7	3			**1165PC03-0370**	3.7	52	20	15	○	○
3.8	3			**1165PC03-0380**	3.8	55	22	17	○	○
3.9	3			**1165PC03-0390**	3.9	55	22	17	○	○
4.0	3			**1165PC03-0400**	4.0	55	22	17	○	○
4.1	3			**1165PC03-0410**	4.1	55	22	17	○	○
4.2	3			**1165PC03-0420**	4.2	55	22	17	○	○
4.3	3			**1165PC03-0430**	4.3	58	24	18	○	○
4.4	3			**1165PC03-0440**	4.4	58	24	18	○	○
4.5	3			**1165PC03-0450**	4.5	58	24	18	○	○
4.6	3			**1165PC03-0460**	4.6	58	24	18	○	○
4.7	3			**1165PC03-0470**	4.7	58	24	18	○	○
4.8	3			**1165PC03-0480**	4.8	62	26	20	○	○
4.9	3			**1165PC03-0490**	4.9	62	26	20	○	○
5.0	3			**1165PC03-0500**	5.0	62	26	20	○	○
5.1	3			**1165PC03-0510**	5.1	62	26	20	○	○
5.2	3			**1165PC03-0520**	5.2	62	26	20	○	○
5.3	3			**1165PC03-0530**	5.3	62	26	20	○	○
5.4	3			**1165PC03-0540**	5.4	66	28	21	○	○
5.5	3			**1165PC03-0550**	5.5	66	28	21	○	○
5.6	3			**1165PC03-0560**	5.6	66	28	21	○	○
5.7	3			**1165PC03-0570**	5.7	66	28	21	○	○
5.8	3			**1165PC03-0580**	5.8	66	28	21	○	○
5.9	3			**1165PC03-0590**	5.9	66	28	21	○	○
6.0	3			**1165PC03-0600**	6.0	66	28	21	○	○
6.1	3			**1165PC03-0610**	6.1	70	31	23	○	○
6.2	3			**1165PC03-0620**	6.2	70	31	23	○	○

Code key C 8
ISO Kennzeichen

Cutting data 69-81
Schnittdaten

Technical Information C82-87
Technische Information

Non-standart tailor made C 89-93
Bestellformular für Sonderwerkzeuge

Drill diameter $d_1(h_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen				Grade · Sorte	
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	KDG303	YK30F
					$d_2(h_7)$	l_1	l_2	l_3		
6.3	3	External · Extern	Straight shank Zylinder-schaft	**1165PC03-0630**	6.3	70	31	23	○	○
6.4	3			**1165PC03-0640**	6.4	70	31	23	○	○
6.5	3			**1165PC03-0650**	6.5	70	31	23	○	○
6.6	3			**1165PC03-0660**	6.6	70	31	23	○	○
6.7	3			**1165PC03-0670**	6.7	70	31	23	○	○
6.8	3			**1165PC03-0680**	6.8	74	34	25	○	○
6.9	3			**1165PC03-0690**	6.9	74	34	25	○	○
7.0	3			**1165PC03-0700**	7.0	74	34	25	○	○
7.1	3			**1165PC03-0710**	7.1	74	34	25	○	○
7.2	3			**1165PC03-0720**	7.2	74	34	25	○	○
7.3	3			**1165PC03-0730**	7.3	74	34	25	○	○
7.4	3			**1165PC03-0740**	7.4	74	34	25	○	○
7.5	3			**1165PC03-0750**	7.5	74	34	25	○	○
7.6	3			**1165PC03-0760**	7.6	79	37	27	○	○
7.7	3			**1165PC03-0770**	7.7	79	37	27	○	○
7.8	3			**1165PC03-0780**	7.8	79	37	27	○	○
7.9	3			**1165PC03-0790**	7.9	79	37	27	○	○
8.0	3			**1165PC03-0800**	8.0	79	37	27	○	○
8.1	3			**1165PC03-0810**	8.1	79	37	27	○	○
8.2	3			**1165PC03-0820**	8.2	79	37	27	○	○
8.3	3			**1165PC03-0830**	8.3	79	37	27	○	○
8.4	3			**1165PC03-0840**	8.4	79	37	27	○	○
8.5	3			**1165PC03-0850**	8.5	79	37	27	○	○
8.6	3			**1165PC03-0860**	8.6	84	40	29	○	○
8.7	3			**1165PC03-0870**	8.7	84	40	29	○	○
8.8	3			**1165PC03-0880**	8.8	84	40	29	○	○
9.0	3			**1165PC03-0900**	9.0	84	40	29	○	○
9.1	3			**1165PC03-0910**	9.1	84	40	29	○	○
9.2	3			**1165PC03-0920**	9.2	84	40	29	○	○
9.3	3			**1165PC03-0930**	9.3	84	40	29	○	○
9.4	3			**1165PC03-0940**	9.4	84	40	29	○	○
9.5	3			**1165PC03-0950**	9.5	84	40	29	○	○
9.6	3			**1165PC03-0960**	9.6	89	43	31	○	○
9.7	3			**1165PC03-0970**	9.7	89	43	31	○	○
9.8	3			**1165PC03-0980**	9.8	89	43	31	○	○
9.9	3			**1165PC03-0990**	9.9	89	43	31	○	○
10.0	3			**1165PC03-1000**	10.0	89	43	31	○	○
10.1	3			**1165PC03-1010**	10.1	89	43	31	○	○
10.2	3			**1165PC03-1020**	10.2	89	43	31	○	○
10.3	3			**1165PC03-1030**	10.3	89	43	31	○	○
10.5	3			**1165PC03-1050**	10.5	89	43	31	○	○
11.0	3			**1165PC03-1100**	11.0	95	47	33	○	○
11.2	3			**1165PC03-1120**	11.2	95	47	33	○	○
11.5	3			**1165PC03-1150**	11.5	95	47	33	○	○
11.8	3			**1165PC03-1180**	11.8	95	47	33	○	○

Drill diameter $d_1(h_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen				Grade · Sorte	
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	KDG303	YK30F
					$d_2(h_7)$	l_1	l_2	l_3		
12.0	3	External · Extern	Straight shank Zylinder-schaft	**1165PC03-1200**	12.0	102	51	35	○	○
12.1	3			**1165PC03-1210**	12.1	102	51	35	○	○
12.5	3			**1165PC03-1250**	12.5	102	51	35	○	○
13.0	3			**1165PC03-1300**	13.0	102	51	35	○	○
13.5	3			**1165PC03-1350**	13.5	107	54	37	○	○
14.0	3			**1165PC03-1400**	14.0	107	54	37	○	○
14.5	3			**1165PC03-1450**	14.5	111	56	38	○	○
15.0	3			**1165PC03-1500**	15.0	111	56	38	○	○
15.5	3			**1165PC03-1550**	15.5	115	58	38	○	○
16.0	3			**1165PC03-1600**	16.0	115	58	38	○	○
16.5	3			**1165PC03-1650**	16.5	119	60	39	○	○
17.0	3			**1165PC03-1700**	17.0	119	60	39	○	○
17.5	3			**1165PC03-1750**	17.5	123	62	40	○	○
18.0	3			**1165PC03-1800**	18.0	123	62	40	○	○
18.5	3			**1165PC03-1850**	18.5	127	64	41	○	○
19.0	3			**1165PC03-1900**	19.0	127	64	41	○	○
19.5	3			**1165PC03-1950**	19.5	131	66	42	○	○
20.0	3			**1165PC03-2000**	20.0	131	66	42	○	○

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

Grade	Workpiece material · Werkstückstoff										
	Mild steel Baustahl HB≤180	Carbon steel, Alloy steel	Hardened steel · gehärteter Stahl			Stainless steel Rostfreier Stahl	Cast iron Gusseisen	Nodular cast iron GGG	Aluminum alloy Alu-leg.	Copper alloy Kupfer leg.	Heat resist. alloy warmfest. leg.
			~40HRC	~50HRC	~60HRC						
KDG303							✔	✔			
YK30F							✔	✔			

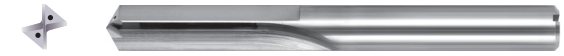
Code key C 8
ISO Kennzeichen
Cutting data 69-81
Schnittdaten
Technical Information C82-87
Technische Information
Non-standart tailor made C 89-93
Bestellformular für Sonderwerkzeuge

PC series · PC Serie for cast iron, AL alloy · für Grauguss Alu Legierungen



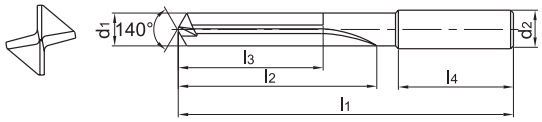
External Coolant
Externe Kühlung

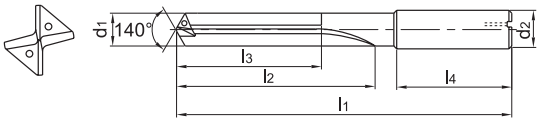
Straight shank
Zylinderschaft



Internal Coolant
Interne Kühlung

Straight shank
Zylinderschaft





- For materials with short chips such as cast iron, silicon-aluminum alloy etc.
- Excellent self centering capability can machine high efficiently, and the hole precision can reach H7.
- High positional accuracy, high linearity and good surface finish can be obtained in the hole drilled.
- Bearbeitung von kurzspanenden Werkstoffen wie Grauguss, silizium-Alu Legierungen etc
- Exzellente Zentrierungseigenschaften für hocheffiziente Bearbeitung, Bohrungsqualität bis H7.
- Hohe Genauigkeit, hohe Zentrizität und gute Oberflächenqualität wird auf der gesamten Bohrungslänge erzielt.

Drill diameter Bohrer Ø $d_1(m_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen					Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	Shank length Schaftlänge	
					$d_2(h_6)$	l_1	l_2	l_3	l_4	YK20F
4.0	5	External Extern	Straight shank Zylinder-schaft	**1576PC05-0400**	6.0	74	36	29	36	○
4.2	5			**1576PC05-0420**	6.0	74	36	29	36	○
5.0	5			**1576PC05-0500**	6.0	82	44	35	36	○
	15	Internal Intern		**1579PC15C-0500**	6.0	145	105	96	36	○
6.0	5	External Extern		**1576PC05-0600**	6.0	82	44	35	36	○
	15	Internal Intern		**1579PC15C-0600**	6.0	145	105	96	36	○
6.75	5	External Extern		**1576PC05-0675**	8.0	91	53	43	36	○
7.0	5			**1576PC05-0700**	8.0	91	53	43	36	○
8.0	5			**1576PC05-0800**	8.0	91	53	43	36	○
	15	Internal Intern		**1579PC15C-0800**	8.0	180	137	127	36	○
8.5	5	External Extern		**1576PC05-0850**	10.0	103	61	49	40	○
9.0	5			**1576PC05-0900**	10.0	103	61	49	40	○
	15	Internal Intern		**1579PC15C-0900**	10.0	217	170	158	40	○
10.0	5	External Extern		**1576PC05-1000**	10.0	103	61	49	40	○
	15	Internal Intern		**1579PC15C-1000**	10.0	217	170	158	40	○
10.25	5	External Extern		**1576PC05-1025**	12.0	118	71	56	45	○
11.0	5			**1576PC05-1100**	12.0	118	71	56	45	○
	15	Internal Intern		**1579PC15C-1100**	12.0	258	205	190	45	○
12.0	5	External Extern		**1576PC05-1200**	12.0	118	71	56	45	○
	15	Internal Intern		**1579PC15C-1200**	12.0	258	205	190	45	○
13.0	5	External Extern		**1576PC05-1300**	14.0	124	77	60	45	○
14.0	5			**1576PC05-1400**	14.0	124	77	60	45	○
	15	Internal Intern		**1579PC15C-1400**	14.0	290	236	219	45	○
15.0	5	External Extern		**1576PC05-1500**	16.0	133	83	63	48	○
15.5	5			**1576PC05-1550**	16.0	133	83	63	48	○

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

Grade	Workpiece material · Werkstückstoff										
	Mild steel Baustahl HB≤180	Carbon steel, Alloy steel	Hardened steel · gehärteter Stahl			Stainless steel Rostfreier Stahl	Cast iron	Nodular cast iron GGG	Aluminum alloy Alu-leg.	Copper alloy Kupfer leg.	Heat resist. alloy warmfest. leg.
			~40HRC	~50HRC	~60HRC						
YK20F							✔	✔	✔		

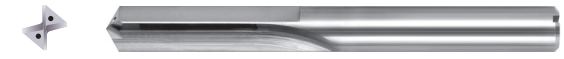
 ● ex Stock Lager ○ on demand · auf Anfrage

PC series · PC Serie for cast iron & AL alloy · für Grauguss & Alu Legierungen



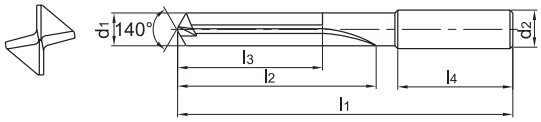
External Coolant
Externe Kühlung

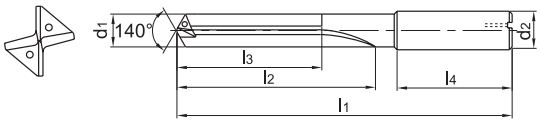
Straight shank
Zylinderschaft



Internal Coolant
Interne Kühlung

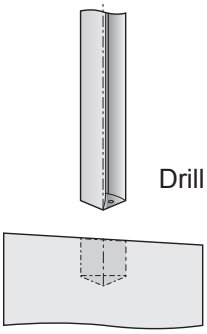
Straight shank
Zylinderschaft





- For materials with short chips such as cast iron, silicon-aluminum alloy etc.
- Excellent self centering capability can machine high efficiently, and the hole precision can reach H7.
- High positional accuracy, high linearity and good surface finish can be obtained in the hole drilled.
- Bearbeitung von kurzspanenden Werkstoffen wie Grauguss, silizium-Alu Legierungen etc.
- Exzellente Zentrierungseigenschaften für hocheffiziente Bearbeitung, Bohrungsqualität bis H7.
- Hohe Genauigkeit, hohe Zentrizität und gute Oberflächenqualität wird auf der gesamten Bohrungslänge erzielt.

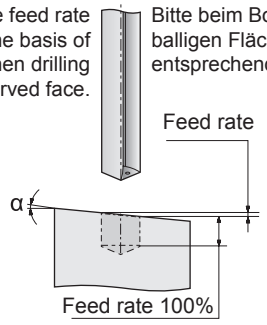
Drill diameter Bohrer Ø $d_1(m_7)$	Drilling depth Bohrtiefe (L/d)	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen					Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	effective drill. length Effektive Nutzlänge	Shank length Schaftlänge	
					$d_2(h_6)$	l_1	l_2	l_3	l_4	YK20F
16.0	5	External Extern	Straight shank Zylinder-schaft	**1576PC05-1600**	16.0	133	83	63	48	○
17.0	5			**1576PC05-1700**	18.0	143	93	71	48	○
17.5	5			**1576PC05-1750**	18.0	143	93	71	48	○
18.0	5			**1576PC05-1800**	18.0	143	93	71	48	○
19.5	5			**1576PC05-1950**	20.0	153	101	77	50	○
20.0	5			**1576PC05-2000**	20.0	153	101	77	50	○



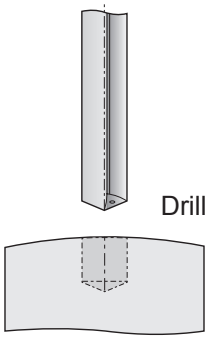
Drill inclined face
· Bohren in Schrägen

Please reduce the feed rate correspondingly to the basis of recommended parameters when drilling inclined or curved face.

Bitte beim Bohren in schrägen oder balligen Flächen den Vorschub entsprechend reduzieren.



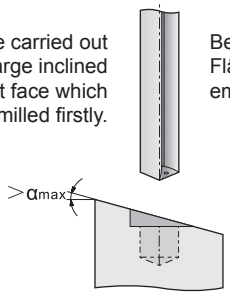
Inclined angle α	Max. feed rate
1°	80%
2°	50%
3°	30%



Drill curved face
· Bohren in balligen Flächen

Pretreatment should be carried out when the face possess a large inclined angle, drill hole at the flat face which milled firstly.

Beim Bohren in sehr großen schrägen Flächen, ist eine Vorbearbeitung zu empfehlen.(Anfasen)



Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

Grade Sorte	Workpiece material · Werkstückstoff										
	Mild steel Baustahl HB≤180	Carbon steel, Alloy steel	Hardened steel · gehärteter Stahl			Stainless steel Rostfreier Stahl	Cast iron Gusseisen	Nodular cast iron GGG	Aluminum alloy Alu leg.	Copper alloy Kupfer leg.	Heat resist. alloy warmfest. leg.
			~40HRC	~50HRC	~60HRC						
YK20F							✔	✔	✔		

Code key C 8
ISO Kennzeichen

Cutting data 69-81
Schnittdaten

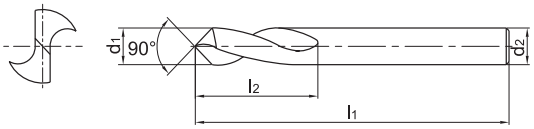
Technical Information C82-87
Technische Information

Non-standart tailor made C 89-93
Bestellformular für Sonderwerkzeuge

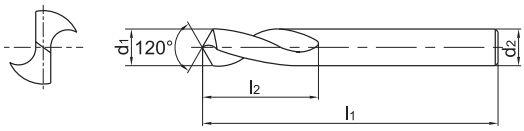
● ex Stock Lager · ab Lager ○ on demand · auf Anfrage

SC series · SC Serie for cast iron & AL alloy · für Grauguss & Alu Legierungen





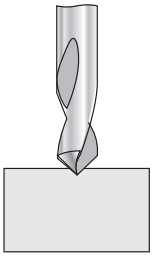




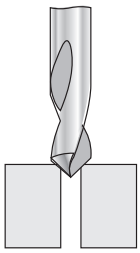
- Suitable for drilling center hole and chamfer.
- Comparing with common centering drills, it possesses more stable centering capability. Even at the slant face, it is also easy to carry out center drilling.
- Für Zentrierbohren und Fasen.
- Die Bohrer sind in ihrer Stabilität höher im Vergleich zu normalen Zentrierbohren.

Drill diameter Bohrer Ø $d_1(h_6)$	Point angle Spitzen-winkel	Cooling mode Kühlmittel.	Shank Schaft	Type · Typ	Basic dimension(mm) · Basis Abmessungen			Grade Sorte
					Shank · Schaft Ø diameter	Overall length Gesamtlänge	Flute length Nutenlänge	
					$d_2(h_6)$	l_1	l_2	YK20F
5	90°	External Extern	Straight shank Zylinder-schaft	**1143SC90-0500**	5.00	62	10	○
	120°			**1143SC120-0500**	5.00	62	10	○
6	90°			**1143SC90-0600**	6.00	66	15	○
	120°			**1143SC120-0600**	6.00	66	15	○
8	90°			**1143SC90-0800**	8.00	79	17	○
	120°			**1143SC120-0800**	8.00	79	17	○
10	90°			**1143SC90-1000**	10.00	89	20	○
	120°			**1143SC120-1000**	10.00	89	20	○
12	90°			**1143SC90-1200**	12.00	102	25	○
	120°			**1143SC120-1200**	12.00	102	25	○
14	90°			**1143SC90-1400**	14.00	107	30	○
	120°			**1143SC120-1400**	14.00	107	30	○
16	90°			**1143SC90-1600**	16.00	115	35	○
	120°			**1143SC120-1600**	16.00	115	35	○
20	90°			**1143SC90-2000**	20.00	131	40	○
	120°			**1143SC120-2000**	20.00	131	40	○

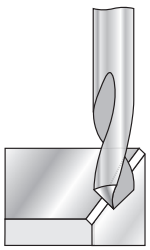
Centering
Zentrieren



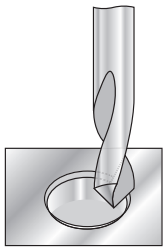
Hole chamfering
Bohrungen anfasen



Chamfering
Fasen



Hole chamfering
größere Bohrungen anfasen



✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

Material Overview · Material Übersicht

Grade Sorte	Workpiece material · Werkstückstoff										
	Mild steel Baustahl HB≤180	Carbon steel, Alloy steel	Hardened steel · gehärteter Stahl			Stainless steel Rostfreier Stahl	Cast iron Gusseisen	Nodular cast iron GGG	Aluminum alloy Alu leg.	Copper alloy Kupfer leg.	Heat resist. alloy warmfest. leg.
			~40HRC	~50HRC	~60HRC						
YK20F							✔	✔	✔		

SU series twist drills · SU Spiralbohrer Serie (External coolant/ Kühlung) 3D 5D

Workpiece material / Werkstück-stoff	Mild steel Baustahl HB≤180		Carbon steel, alloy steel Kohlenstoffstahl leg. Stahl ~30HRC		Pre-hardened steel vergüteter Stahl ~40HRC		Stainless steel Rostfreier Stahl		Cast iron Gusseisen		Nodular cast iron GGG		Aluminum alloy Alu. Legierungen		Heat resistant alloy Warmfeste Legierungen	
Cutting speed	60~120m/min		60~120m/min		40~70m/min		25~40m/min		60~120m/min		50~100m/min		60~140m/min		15~25m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)
2	14000	0.06~0.08	14000	0.06~0.08	9500	0.06~0.08	5500	0.02~0.05	14000	0.06~0.08	11000	0.06~0.08	16000	0.06~0.08	3200	0.02~0.04
3	9500	0.09~0.12	9500	0.09~0.12	6300	0.09~0.12	3700	0.03~0.07	9500	0.09~0.12	7400	0.09~0.12	10600	0.09~0.12	2100	0.03~0.06
4	7000	0.10~0.15	7000	0.10~0.15	4700	0.10~0.15	2700	0.04~0.08	7000	0.10~0.15	5600	0.10~0.15	8000	0.10~0.15	1600	0.04~0.07
5	5700	0.12~0.18	5700	0.12~0.18	3800	0.12~0.18	2200	0.05~0.10	5700	0.12~0.18	4500	0.12~0.18	6400	0.12~0.18	1250	0.05~0.09
6	4700	0.14~0.20	4700	0.14~0.20	3100	0.14~0.20	1850	0.06~0.12	4700	0.14~0.20	3700	0.14~0.20	5300	0.14~0.20	1050	0.06~0.11
8	3600	0.16~0.24	3600	0.16~0.24	2400	0.16~0.24	1400	0.08~0.16	3600	0.16~0.24	2800	0.16~0.24	4000	0.16~0.24	800	0.08~0.14
10	2800	0.18~0.27	2800	0.18~0.27	1900	0.18~0.27	1100	0.10~0.18	2800	0.18~0.27	2200	0.18~0.27	3200	0.18~0.27	600	0.10~0.16
12	2400	0.20~0.30	2400	0.20~0.30	1600	0.20~0.30	930	0.12~0.20	2400	0.20~0.30	1900	0.20~0.30	2700	0.20~0.30	500	0.12~0.18
14	2100	0.22~0.35	2100	0.22~0.35	1400	0.22~0.35	800	0.13~0.22	2100	0.22~0.35	1600	0.22~0.35	2300	0.22~0.35	450	0.13~0.20
16	1800	0.25~0.36	1800	0.25~0.36	1200	0.25~0.36	700	0.14~0.25	1800	0.25~0.36	1400	0.25~0.36	2000	0.25~0.36	400	0.14~0.23
18	1600	0.28~0.38	1600	0.28~0.38	1100	0.28~0.38	620	0.15~0.28	1600	0.28~0.38	1200	0.28~0.38	1800	0.28~0.38	350	0.15~0.25
20	1400	0.30~0.40	1400	0.30~0.40	950	0.30~0.40	550	0.16~0.30	1400	0.30~0.40	1100	0.30~0.40	1600	0.30~0.40	320	0.16~0.28

1.When the tool is used for the first time, please make a test cutting with 90% of cutting speed or 85% feed rate mentioned above. If the cutting conditions remain stable, gradually increase the cutting speed and feed rate.
2.The cutting conditions above are for drilling with emulsion.
3.Use a collet without any defect or dust. The radial run-out of drill must be under 0.02mm.
4.These conditions above are for cutting depth under 5D.

1. Beim ersten Einsatz 90% der empfohlenen Schnittgeschwindigkeit oder 85% des Vorschubes wählen. Bei stabiler Bearbeitung die Schnittdaten entsprechend erhöhen.
2. Die obigen Schnittdatenempfehlung basieren auf dem Einsatz von Emulsion.
3. Keine defekte Werkzeugaufnahme wählen. Die Rundlaufgenauigkeit muss unter 0,02mm liegen.
4. Die obigen Schnittdaten sind für Bohrungstiefen unter 5xD ausgelegt.

SU series twist drills SU Spiralbohrer Serie (Internal coolant/ Kühlung)

3D 5D

Workpiece material / Werkstück-stoff	Mild steel Baustahl HB≤180		Carbon steel, alloy steel Kohlenstoffstahl leg. Stahl ~30HRC		Pre-hardened steel vergüteter Stahl ~40HRC		Stainless steel Rostfreier Stahl		Cast iron Gusseisen		Nodular cast iron GGG		Aluminum alloy Alu. Legierungen		Heat resistant alloy Warmfeste Legierungen	
Cutting speed	80~150m/min		80~150m/min		50~80m/min		50~80m/min		80~150m/min		60~120m/min		100~180m/min		15~25m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)
3	12700	0.09~0.12	12700	0.09~0.12	7400	0.09~0.12	6300	0.03~0.07	12700	0.09~0.12	9500	0.09~0.12	15000	0.09~0.12	2100	0.03~0.06
4	9600	0.10~0.15	9600	0.10~0.15	5600	0.10~0.15	4700	0.04~0.08	9600	0.10~0.15	7000	0.10~0.15	11100	0.10~0.15	1600	0.04~0.07
5	7600	0.12~0.18	7600	0.12~0.18	4500	0.12~0.18	3800	0.05~0.10	7600	0.12~0.18	5700	0.12~0.18	9000	0.12~0.18	1250	0.05~0.09
6	6400	0.14~0.20	6400	0.14~0.20	3700	0.14~0.20	3200	0.06~0.12	6400	0.14~0.20	4700	0.14~0.20	7400	0.14~0.20	1050	0.06~0.11
8	4800	0.16~0.24	4800	0.16~0.24	2800	0.16~0.24	2400	0.08~0.16	4800	0.16~0.24	3600	0.16~0.24	5600	0.16~0.24	800	0.08~0.14
10	3800	0.18~0.27	3800	0.18~0.27	2200	0.18~0.27	1900	0.10~0.18	3800	0.18~0.27	2800	0.18~0.27	4500	0.18~0.27	600	0.10~0.16
12	3200	0.20~0.30	3200	0.20~0.30	1900	0.20~0.30	1600	0.12~0.20	3200	0.20~0.30	2400	0.20~0.30	3700	0.20~0.30	500	0.12~0.18
14	2700	0.22~0.35	2700	0.22~0.35	1600	0.22~0.35	1350	0.13~0.22	2700	0.22~0.35	2100	0.22~0.35	3200	0.22~0.35	450	0.13~0.20
16	2400	0.25~0.36	2400	0.25~0.36	1400	0.25~0.36	1200	0.14~0.25	2400	0.25~0.36	1800	0.25~0.36	2800	0.25~0.36	400	0.14~0.23
18	2100	0.28~0.38	2100	0.28~0.38	1200	0.28~0.38	1050	0.15~0.28	2100	0.28~0.38	1600	0.28~0.38	2500	0.28~0.38	350	0.15~0.25
20	1900	0.30~0.40	1900	0.30~0.40	1100	0.30~0.40	950	0.16~0.30	1900	0.30~0.40	1400	0.30~0.40	2300	0.30~0.40	320	0.16~0.28

1.When the tool is used for the first time, please make a test cutting with 90% of cutting speed or 85% feed rate mentioned above. If the cutting conditions remain stable, gradually increase the cutting speed and feed rate.
2.The cutting conditions above are for drilling with emulsion.
3.Use a collet without any defect or dust. The radial run-out of drill must be under 0.02mm.
4.These conditions above are for cutting depth under 5D.

1. Beim ersten Einsatz 90% der empfohlenen Schnittgeschwindigkeit oder 85% des Vorschubes wählen. Bei stabiler Bearbeitung die Schnittdaten entsprechend erhöhen.
2. Die obigen Schnittdatenempfehlung basieren auf dem Einsatz von Emulsion.
3. Keine defekte Werkzeugaufnahme wählen. Die Rundlaufgenauigkeit muss unter 0,02mm liegen.
4. Die obigen Schnittdaten sind für Bohrungstiefen unter 5xD ausgelegt.

SU series twist drills · SU Spiralbohrer Serie (Internal coolant/ Kühlung)

8D

Workpiece material / Werkstück-stoff	Mild steel Baustahl HB≤180		Carbon steel, alloy steel Kohlenstoffstahl leg. Stahl ~30HRC		Pre-hardened steel vergüteter Stahl ~40HRC		Stainless steel Rostfreier Stahl		Cast iron Gusseisen		Nodular cast iron GGG		Aluminum alloy Alu. Legierungen		Heat resistant alloy Warmfeste Legierungen	
Cutting speed	80~150m/min		80~150m/min		50~80m/min		40~60m/min		80~150m/min		60~120m/min		100~180m/min		15~25m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)
3	12700	0.06~0.10	12700	0.06~0.10	7400	0.06~0.10	5300	0.03~0.07	12700	0.06~0.10	9500	0.06~0.10	15000	0.09~0.12	2100	0.03~0.06
4	9600	0.08~0.12	9600	0.08~0.12	5600	0.08~0.12	4000	0.04~0.08	9600	0.08~0.12	7000	0.08~0.12	11100	0.10~0.15	1600	0.04~0.07
5	7600	0.10~0.14	7600	0.10~0.14	4500	0.10~0.14	3200	0.05~0.10	7600	0.10~0.14	5700	0.10~0.14	9000	0.10~0.14	1250	0.05~0.09
6	6400	0.11~0.16	6400	0.11~0.16	3700	0.11~0.16	2700	0.06~0.12	6400	0.11~0.16	4700	0.11~0.16	7400	0.11~0.16	1050	0.06~0.11
8	4800	0.13~0.19	4800	0.13~0.19	2800	0.13~0.19	2000	0.08~0.16	4800	0.13~0.19	3600	0.13~0.19	5600	0.13~0.19	800	0.08~0.14
10	3800	0.14~0.22	3800	0.14~0.22	2200	0.14~0.22	1600	0.10~0.18	3800	0.14~0.22	2800	0.14~0.22	4500	0.14~0.22	600	0.10~0.16
12	3200	0.16~0.24	3200	0.16~0.24	1900	0.16~0.24	1300	0.12~0.20	3200	0.16~0.24	2400	0.16~0.24	3700	0.16~0.24	500	0.12~0.18
14	2700	0.18~0.28	2700	0.18~0.28	1600	0.18~0.28	1100	0.13~0.22	2700	0.18~0.28	2100	0.18~0.28	3200	0.18~0.28	450	0.13~0.20
16	2400	0.20~0.29	2400	0.20~0.29	1400	0.20~0.29	1000	0.14~0.25	2400	0.20~0.29	1800	0.20~0.29	2800	0.20~0.29	400	0.14~0.23
18	2100	0.24~0.32	2100	0.24~0.32	1200	0.24~0.32	880	0.15~0.28	2100	0.24~0.32	1600	0.24~0.32	2500	0.24~0.32	350	0.15~0.25

1.When the tool is used for the first time, please make a test cutting with 90% of cutting speed or 85% feed rate mentioned above. If the cutting conditions remain stable, gradually increase the cutting speed and feed rate.
2.The cutting conditions above are for drilling with emulsion.
3.Use a collet without any defect or dust. The radial run-out of drill must be under 0.02mm.
4.These conditions above are for cutting depth under 8D.

1. Beim ersten Einsatz 90% der empfohlenen Schnittgeschwindigkeit oder 85% des Vorschubes wählen. Bei stabiler Bearbeitung die Schnittdaten entsprechend erhöhen.
2. Die obigen Schnittdatenempfehlung basieren auf dem Einsatz von Emulsion.
3. Keine defekte Werkzeugaufnahme wählen. Die Rundlaufgenauigkeit muss unter 0,02mm liegen.
4. Die obigen Schnittdaten sind für Bohrungstiefen unter 8xD ausgelegt.

SU series step drills · SU Stufenbohrer Serie (External coolant/ Kühlung)

workpiece material Werkstück-stoff	Mild steel Baustahl HB≤180		Carbon steel, alloy steel Kohlenstoffstahl leg. Stahl ~30HRC		Pre-hardened steel vergüteter Stahl ~40HRC		Stainless steel Rostfreier Stahl		Cast iron Gusseisen		Nodular cast iron GGG		Aluminum alloy Alu. Legierungen		Heat resistant alloy Warmfeste Legierungen	
Cutting speed	50~100m/min		50~100m/min		30~50m/min		25~40m/min		50~100m/min		40~80m/min		60~120m/min		15~25m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)
3.3	5800	0.09~0.12	5800	0.09~0.12	3850	0.09~0.12	2900	0.03~0.07	5800	0.09~0.12	5000	0.09~0.12	10000	0.09~0.12	1600	0.03~0.06
4.2	4550	0.10~0.15	4550	0.10~0.15	3000	0.10~0.15	2300	0.04~0.08	4550	0.10~0.15	3800	0.10~0.15	7600	0.10~0.15	1250	0.04~0.07
5	3800	0.12~0.18	3800	0.12~0.18	2550	0.12~0.18	1900	0.05~0.10	3800	0.12~0.18	3200	0.12~0.18	6400	0.12~0.18	1050	0.05~0.10
6.75	2850	0.14~0.20	2850	0.14~0.20	1900	0.14~0.20	1400	0.06~0.12	2850	0.14~0.20	2400	0.14~0.20	4800	0.14~0.20	800	0.06~0.11
7	2750	0.15~0.22	2750	0.15~0.22	1800	0.15~0.22	1350	0.07~0.14	2750	0.15~0.22	2300	0.15~0.22	4550	0.15~0.22	730	0.07~0.12
8.5	2250	0.16~0.24	2250	0.16~0.24	1500	0.16~0.24	1100	0.08~0.16	2250	0.16~0.24	1800	0.16~0.24	3600	0.16~0.24	600	0.08~0.14
9	2100	0.17~0.25	2100	0.17~0.25	1400	0.17~0.25	1050	0.09~0.17	2100	0.17~0.25	1750	0.17~0.25	3500	0.17~0.25	560	0.09~0.15
10.25	1850	0.18~0.27	1850	0.18~0.27	1250	0.18~0.27	930	0.10~0.18	1850	0.18~0.27	1550	0.18~0.27	3100	0.18~0.27	500	0.10~0.16
10.5	1800	0.19~0.28	1800	0.19~0.28	1200	0.19~0.28	900	0.11~0.19	1800	0.19~0.28	1500	0.19~0.28	3000	0.19~0.28	480	0.11~0.17
12	1600	0.20~0.30	1600	0.20~0.30	1050	0.20~0.30	800	0.12~0.20	1600	0.20~0.30	1300	0.20~0.30	2600	0.20~0.30	450	0.12~0.18
12.5	1550	0.20~0.30	1550	0.20~0.30	1000	0.20~0.30	760	0.12~0.20	1550	0.20~0.30	1250	0.20~0.30	2550	0.20~0.30	410	0.12~0.18
14	1350	0.22~0.35	1350	0.22~0.35	900	0.22~0.35	700	0.14~0.24	1350	0.22~0.35	1150	0.22~0.35	2300	0.22~0.35	370	0.13~0.20
14.5	1300	0.22~0.35	1300	0.22~0.35	880	0.22~0.35	650	0.14~0.24	1300	0.22~0.35	1050	0.22~0.35	2200	0.22~0.35	350	0.13~0.20

1.When the tool is used for the first time, please make a test cutting with 90% of cutting speed or 85% feed rate mentioned above. If the cutting conditions remain stable, gradually increase the cutting speed and feed rate.
2.The cutting conditions above are for drilling with emulsion.
3.Use a collet without any defect or dust. The radial run-out of drill must be under 0.02mm.

1. Beim ersten Einsatz 90% der empfohlenen Schnittgeschwindigkeit oder 85% des Vorschubes wählen. Bei stabiler Bearbeitung die Schnittdaten entsprechend erhöhen.
2. Die obigen Schnittdatenempfehlung basieren auf dem Einsatz von Emulsion.
3. Keine defekte Werkzeugaufnahme wählen. Die Rundlaufgenauigkeit muss unten 0,02mm liegen.

ST series twist drills · ST Spiralbohrer Serie (Internal coolant/ Kühlung)

3D 5D

Workpiece material Werkstück-stoff	Mild steel Baustahl HB≤180		Carbon steel, alloy steel Kohlenstoffstahl leg. Stahl ~30HRC		Stainless steel · Rostfreier Stahl					
					Austenite		Martensite		Ferrite	
Cutting speed	80~150m/min		80~150m/min		40~80 m/min		50~100 m/min		60~120 m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)
3	12700	0.09~0.12	12700	0.09~0.12	6300	0.03~0.07	7400	0.03~0.07	9000	0.03~0.07
4	9600	0.10~0.15	9600	0.10~0.15	4700	0.04~0.08	5600	0.04~0.08	6700	0.04~0.08
5	7600	0.12~0.18	7600	0.12~0.18	3800	0.05~0.10	4500	0.05~0.10	5400	0.05~0.10
6	6400	0.14~0.20	6400	0.14~0.20	3200	0.06~0.12	3700	0.06~0.12	4500	0.06~0.12
8	4800	0.16~0.24	4800	0.16~0.24	2400	0.08~0.16	2800	0.08~0.16	3400	0.08~0.16
10	3800	0.18~0.27	3800	0.18~0.27	1900	0.10~0.18	2200	0.10~0.18	2700	0.10~0.18
12	3200	0.20~0.30	3200	0.20~0.30	1600	0.12~0.20	1900	0.12~0.20	2300	0.12~0.20
14	2700	0.22~0.35	2700	0.22~0.35	1350	0.13~0.22	1600	0.13~0.22	1900	0.13~0.22
16	2400	0.25~0.36	2400	0.25~0.36	1200	0.14~0.25	1400	0.14~0.25	1700	0.14~0.25
18	2100	0.28~0.38	2100	0.28~0.38	1050	0.15~0.28	1200	0.15~0.28	1500	0.15~0.28
20	1900	0.30~0.40	1900	0.30~0.40	950	0.16~0.30	1100	0.16~0.30	1350	0.16~0.30

1.When the tool is used for the first time, please make a test cutting with 90% of cutting speed or 85% feed rate mentioned above. If the cutting conditions remain stable, gradually increase the cutting speed and feed rate.
2.The cutting conditions above are for drilling with emulsion.
3.Use a collet without any defect or dust. The radial run-out of drill must be under 0.02mm.
4.These conditions above are for cutting depth under 5D.

1. Beim ersten Einsatz 90% der empfohlenen Schnittgeschwindigkeit oder 85% des Vorschubes wählen. Bei stabiler Bearbeitung die Schnittdaten entsprechend erhöhen.
2. Die obigen Schnittdatenempfehlung basieren auf dem Einsatz von Emulsion.
3. Keine defekte Werkzeugaufnahme wählen. Die Rundlaufgenauigkeit muss unter 0,02mm liegen.
4. Die obigen Schnittdaten sind für Bohrungstiefen unter 5xD ausgelegt.

SH series step drills SH Spiralbohrer Serie (External coolant/ Kühlung)

3D

Workpiece material Werkstückstoff	Hardened steel · gehärteter Stahl					
	40~50HRC		50~55HRC		55~60HRC	
Cutting speed Schnittgeschw.	20~40m/min		15~30m/min		10~20m/min	
Diameter Ø (mm)	Rotating speed Drehzahl (min^{-1})	Feed rate Vorschub (mm/r)	Rotating speed Drehzahl (min^{-1})	Feed rate Vorschub (mm/r)	Rotating speed Drehzahl (min^{-1})	Feed rate Vorschub (mm/r)
3	3200	0.02~0.03	2100	0.02~0.03	1060	0.015~0.02
4	2400	0.03~0.04	1600	0.03~0.04	800	0.02~0.025
5	1900	0.04~0.05	1250	0.04~0.05	640	0.025~0.03
6	1600	0.05~0.06	1050	0.05~0.06	530	0.03~0.04
8	1200	0.06~0.08	800	0.06~0.07	400	0.04~0.05
10	950	0.08~0.10	640	0.07~0.08	320	0.05~0.06
12	800	0.10~0.12	530	0.08~0.09	270	0.06~0.07
14	680	0.12~0.14	450	0.09~0.10	230	0.07~0.08
16	600	0.14~0.16	400	0.10~0.12	200	0.08~0.10

1.When the tool is used for the first time, please make a test cutting with 90% of cutting speed or 85% feed rate mentioned above. If the cutting conditions remain stable, gradually increase the cutting speed and feed rate.
2.The cutting conditions above are for drilling with emulsion.
3.Use a collet without any defect or dust. The radial run-out of drill must be under 0.02mm.
4. These conditions above are for cutting depth under 3D.

1. Beim ersten Einsatz 90% der empfohlenen Schnittgeschwindigkeit oder 85% des Vorschubes wählen. Bei stabiler Bearbeitung die Schnittdaten entsprechend erhöhen.
2. Die obigen Schnittdatenempfehlung basieren auf dem Einsatz von Emulsion.
3. Keine defekte Werkzeugaufnahme wählen. Die Rundlaufgenauigkeit muss unter 0,02mm liegen.
4. Die obigen Schnittdaten sind für Bohrungstiefen unter 3xD ausgelegt.

SC series twist drills · SC Spiralbohrer Serie (External coolant/ Kühlung) 3D 5D

Workpiece material Werkstückstoff	Cast iron Grauguss		Nodular cast iron GGG		Silicon aluminium alloy Silizium Alu Legierung				Aluminum alloy Alu Legierung	
					Si≤10%		Si>10%			
Cutting speed	50~80m/min		40~70m/min		100~180m/min		80~140m/min		120~200m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)
2	9550	0.06~ 0.08	8000	0.06~ 0.08	20000	0.07~0.16	18000	0.07~0.16	24000	0.07~0.16
3	6400	0.09~ 0.12	5300	0.09~ 0.12	15000	0.09~0.18	12700	0.09~0.18	16000	0.09~0.18
4	4800	0.10~ 0.15	4000	0.10~ 0.15	11000	0.10~0.22	9600	0.10~0.22	12000	0.10~0.22
5	3800	0.12~ 0.18	3200	0.12~ 0.18	9000	0.12~0.25	7600	0.12~0.25	10000	0.12~0.25
6	3100	0.14~ 0.20	2700	0.14~ 0.20	7400	0.14~0.28	6400	0.14~0.28	8500	0.14~0.28
8	2400	0.16~ 0.24	2000	0.16~ 0.24	5600	0.18~0.32	4800	0.18~0.32	6400	0.18~0.32
10	1900	0.18~ 0.27	1600	0.18~ 0.27	4500	0.22~0.36	3800	0.22~0.36	5000	0.22~0.36
12	1600	0.20~ 0.30	1300	0.20~ 0.30	3700	0.25~0.40	3200	0.25~0.40	4200	0.25~0.40
14	1350	0.22~ 0.35	1150	0.22~ 0.35	3200	0.27~0.44	2700	0.27~0.44	3600	0.27~0.44
16	1200	0.25~ 0.36	1000	0.25~ 0.36	2800	0.32~0.48	2400	0.32~0.48	3200	0.32~0.48

1. When the tool is used for the first time, please make a test cutting with 90% of cutting speed or 85% feed rate mentioned above. If the cutting conditions remain stable, gradually increase the cutting speed and feed rate.
2 .The cutting conditions above are for drilling with emulsion.
3.Use a collet without any defect or dust. The radial run-out of drill must be under 0.02mm.
4.These conditions above are for cutting depth under 5D.

1. Beim ersten Einsatz 90% der empfohlenen Schnittgeschwindigkeit oder 85% des Vorschubes wählen. Bei stabiler Bearbeitung die Schnittdaten entsprechend erhöhen.
2. Die obigen Schnittdatenempfehlung basieren auf dem Einsatz von Emulsion.
3. Keine defekte Werkzeugaufnahme wählen. Die Rundlaufgenauigkeit muss unter 0,02mm liegen.
4. Die obigen Schnittdaten sind für Bohrungstiefen unter 5xD ausgelegt.

PA series coated three-lips drills (External coolant/ Kühlung)
PA Serie, beschichtete 3-Lippenbohrer (External coolant/ Kühlung)

3D

Workpiece material Werkstückstoff	Cast iron Grauguss		Nodular cast iron GGG		Silicon aluminium alloy Silizium Alu Legierung				Aluminum alloy Alu Legierung		Heat resistant alloy Warmfeste Legierung	
					Si≤10%		Si>10%					
Cutting speed	60~120m/min		50~100m/min		100~180m/min		80~140m/min		120~200m/min		20~40m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)
3	9500	0.09~0.12	7400	0.09~0.12	14000	0.07~0.16	12700	0.07~0.16	16000	0.07~0.16	3200	0.03~0.06
4	7000	0.10~0.15	5600	0.10~0.15	10000	0.09~0.18	9600	0.09~0.18	12000	0.09~0.18	2400	0.04~0.07
5	5700	0.12~0.18	4500	0.12~0.18	9000	0.10~0.22	7600	0.10~0.22	10000	0.10~0.22	1900	0.05~0.09
6	4700	0.14~0.20	3700	0.14~0.20	7400	0.12~0.25	6400	0.12~0.25	8500	0.12~0.25	1600	0.06~0.11
8	3600	0.16~0.24	2800	0.16~0.24	5600	0.14~0.28	4800	0.14~0.28	6400	0.14~0.28	1200	0.08~0.14
10	2800	0.18~0.27	2200	0.18~0.27	4500	0.18~0.32	3800	0.18~0.32	5000	0.18~0.32	950	0.10~0.16
12	2400	0.20~0.30	1900	0.20~0.30	3700	0.22~0.36	3200	0.22~0.36	4200	0.22~0.36	800	0.12~0.18
14	2100	0.22~0.35	1600	0.22~0.35	3200	0.25~0.40	2700	0.25~0.40	3600	0.25~0.40	700	0.13~0.20
16	1800	0.25~0.36	1400	0.25~0.36	2800	0.27~0.44	2400	0.27~0.44	3200	0.27~0.44	600	0.14~0.23
18	1600	0.28~0.38	1200	0.28~0.38	2500	0.32~0.48	2100	0.32~0.48	2800	0.32~0.48	530	0.15~0.25
20	1400	0.30~0.40	1100	0.30~0.40	2300	0.36~0.54	1900	0.36~0.54	2550	0.36~0.54	480	0.16~0.28

1. When the tool is used for the first time, please make a test cutting with 90% of cutting speed or 85% feed rate mentioned above. If the cutting conditions remain stable, gradually increase the cutting speed and feed rate.
2 .The cutting conditions above are for drilling with emulsion.
3.Use a collet without any defect or dust. The radial run-out of drill must be under 0.02mm.
4.These conditions above are for cutting depth under 3D.

1. Beim ersten Einsatz 90% der empfohlenen Schnittgeschwindigkeit oder 85% des Vorschubes wählen. Bei stabiler Bearbeitung die Schnittdaten entsprechend erhöhen.
2. Die obigen Schnittdatenempfehlung basieren auf dem Einsatz von Emulsion.
3. Keine defekte Werkzeugaufnahme wählen. Die Rundlaufgenauigkeit muss unter 0,02mm liegen.
4. Die obigen Schnittdaten sind für Bohrungstiefen unter 3xD ausgelegt.

PA series uncoated three-lips drills (External coolant/ Kühlung)
PA Serie, unbeschichtete 3-Lippenbohrer (External coolant/ Kühlung)

3D

Workpiece material Werkstückstoff	Cast iron Grauguss		Nodular cast iron GGG		Silicon aluminium alloy Silizium Alu Legierung				Aluminum alloy Alu Legierung		Heat resistant alloy Warmfeste Legierung	
					Si≤10%		Si>10%					
Cutting speed	50~100m/min		40~70m/min		80~160m/min		60~120m/min		100~180m/min		15~25m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)
3	7400	0.09~0.12	5300	0.09~0.12	12700	0.07~0.16	10000	0.07~0.16	15000	0.07~0.16	2100	0.03~0.06
4	5600	0.10~0.15	4000	0.10~0.15	9600	0.09~0.18	8000	0.09~0.18	11000	0.09~0.18	1600	0.04~0.07
5	4500	0.12~0.18	3200	0.12~0.18	7600	0.10~0.22	6300	0.10~0.22	9000	0.10~0.22	1250	0.05~0.09
6	3700	0.14~0.20	2700	0.14~0.20	6400	0.12~0.25	5300	0.12~0.25	7400	0.12~0.25	1050	0.06~0.11
8	2800	0.16~0.24	2000	0.16~0.24	4800	0.14~0.28	4000	0.14~0.28	5600	0.14~0.28	800	0.08~0.14
10	2200	0.18~0.27	1600	0.18~0.27	3800	0.18~0.32	3200	0.18~0.32	4500	0.18~0.32	600	0.10~0.16
12	1900	0.20~0.30	1300	0.20~0.30	3200	0.22~0.36	2700	0.22~0.36	3700	0.22~0.36	500	0.12~0.18
14	1600	0.22~0.35	1100	0.22~0.35	2700	0.25~0.40	2300	0.25~0.40	3200	0.25~0.40	450	0.13~0.20
16	1400	0.25~0.36	1000	0.25~0.36	2400	0.27~0.44	2000	0.27~0.44	2800	0.27~0.44	400	0.14~0.23
18	1200	0.28~0.38	880	0.28~0.38	2100	0.32~0.48	1800	0.32~0.48	2500	0.32~0.48	350	0.15~0.25
20	1100	0.30~0.40	800	0.30~0.40	1900	0.36~0.54	1600	0.36~0.54	2300	0.36~0.54	320	0.16~0.28

1. When the tool is used for the first time, please make a test cutting with 90% of cutting speed or 85% feed rate mentioned above. If the cutting conditions remain stable, gradually increase the cutting speed and feed rate.
2 .The cutting conditions above are for drilling with emulsion.
3.Use a collet without any defect or dust. The radial run-out of drill must be under 0.02mm.
4.These conditions above are for cutting depth under 3D.

1. Beim ersten Einsatz 90% der empfohlenen Schnittgeschwindigkeit oder 85% des Vorschubes wählen. Bei stabiler Bearbeitung die Schnittdaten entsprechend erhöhen.
2. Die obigen Schnittdatenempfehlung basieren auf dem Einsatz von Emulsion.
3. Keine defekte Werkzeugaufnahme wählen. Die Rundlaufgenauigkeit muss unter 0,02mm liegen.
4. Die obigen Schnittdaten sind für Bohrungstiefen unter 3xD ausgelegt.

PC series straight flute drills (External coolant/ Kühlung)
PC gerade genutete Bohrer Serie (External coolant/ Kühlung)

5D

Workpiece material Werkstückstoff	Cast iron Grauguss		Nodular cast iron GGG		Silicon aluminium alloy Silizium Alu Legierung				Aluminum alloy Alu Legierung	
					Si≤10%		Si>10%			
Cutting speed	60~120m/min		50~100m/min		100~200m/min		80~160m/min		120~220m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)
4	7000	0.10~ 0.15	5600	0.10~ 0.15	11000	0.12~ 0.20	9600	0.12~ 0.20	12000	0.12~ 0.20
5	5700	0.12~ 0.18	4500	0.12~ 0.18	9000	0.14~ 0.26	7600	0.14~ 0.26	10000	0.14~ 0.26
6	4700	0.14~ 0.20	3700	0.14~ 0.20	7400	0.16~ 0.28	6400	0.16~ 0.28	8500	0.16~ 0.28
8	3600	0.16~ 0.24	2800	0.16~ 0.24	5500	0.18~ 0.30	4800	0.18~ 0.30	6400	0.18~ 0.30
10	2800	0.18~ 0.27	2200	0.18~ 0.27	4500	0.20~ 0.32	3800	0.20~ 0.32	5000	0.20~ 0.32
12	2400	0.20~ 0.30	1900	0.20~ 0.30	3700	0.24~ 0.36	3200	0.24~ 0.36	4200	0.24~ 0.36
14	2100	0.22~ 0.35	1600	0.22~ 0.35	3200	0.28~ 0.44	2700	0.28~ 0.44	3600	0.28~ 0.44
16	1800	0.25~ 0.36	1400	0.25~ 0.36	2800	0.30~ 0.48	2400	0.30~ 0.48	3200	0.30~ 0.48
18	1600	0.28~0.38	1200	0.28~ 0.38	2500	0.34~ 0.52	2100	0.34~ 0.52	3000	0.34~ 0.52
20	1400	0.30~0.40	1100	0.30~ 0.40	2300	0.40~ 0.63	1900	0.40~ 0.63	2500	0.40~ 0.63

1. When the tool is used for the first time, please make a test cutting with 90% of cutting speed or 85% feed rate mentioned above. If the cutting conditions remain stable, gradually increase the cutting speed and feed rate.
2 .The cutting conditions above are for drilling with emulsion.
3.Use a collet without any defect or dust. The radial run-out of drill must be under 0.02mm.
4.These conditions above are for cutting depth under 5D.

1. Beim ersten Einsatz 90% der empfohlenen Schnittgeschwindigkeit oder 85% des Vorschubes wählen. Bei stabiler Bearbeitung die Schnittdaten entsprechend erhöhen.
2. Die obigen Schnittdatenempfehlung basieren auf dem Einsatz von Emulsion.
3. Keine defekte Werkzeugaufnahme wählen. Die Rundlaufgenauigkeit muss unter 0,02mm liegen.
4. Die obigen Schnittdaten sind für Bohrungstiefen unter 5xD ausgelegt.

PC series straight flute drills (Internal coolant/ Kühlung)
PC Bohrer Serie, gerade genutete (Internal coolant/ Kühlung)

15D

Workpiece material Werkstückstoff	Cast iron Grauguss		Nodular cast iron GGG		Silicon aluminium alloy Silizium Alu Legierung.				Aluminum alloy Alu Legierung	
					Si≤10%		Si>10%			
Cutting speed	60~120m/min		50~100m/min		100~200m/min		80~160m/min		120~220m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)
5	5700	0.08~ 0.14	4500	0.08~ 0.14	9000	0.09~ 0.18	7600	0.09~ 0.18	10000	0.09~ 0.18
6	4700	0.10~ 0.16	3700	0.10~ 0.16	7400	0.12~ 0.20	6400	0.12~ 0.20	8500	0.12~ 0.20
8	3600	0.12~ 0.20	2800	0.12~ 0.20	5500	0.12~ 0.24	4800	0.12~ 0.24	6400	0.12~ 0.24
10	2800	0.14~ 0.23	2200	0.14~ 0.23	4500	0.16~ 0.28	3800	0.16~ 0.28	5000	0.16~ 0.28
12	2400	0.16~ 0.26	1900	0.16~ 0.26	3700	0.18~ 0.32	3200	0.18~ 0.32	4200	0.18~ 0.32
14	2100	0.18~ 0.32	1600	0.18~ 0.32	3200	0.20~ 0.36	2700	0.20~ 0.36	3600	0.20~ 0.36

1. When the tool is used for the first time, please make a test cutting with 90% of cutting speed or 85% feed rate mentioned above. If the cutting conditions remain stable, gradually increase the cutting speed and feed rate.
2 .The cutting conditions above are for drilling with emulsion.
3.Use a collet without any defect or dust. The radial run-out of drill must be under 0.02mm.
4.These conditions above are for cutting depth under 15D.

1. Beim ersten Einsatz 90% der empfohlenen Schnittgeschwindigkeit oder 85% des Vorschubes wählen. Bei stabiler Bearbeitung die Schnittdaten entsprechend erhöhen.
2. Die obigen Schnittdatenempfehlung basieren auf dem Einsatz von Emulsion.
3. Keine defekte Werkzeugaufnahme wählen. Die Rundlaufgenauigkeit muss unter 0,02mm liegen.
4. Die obigen Schnittdaten sind für Bohrungstiefen unter 15xD ausgelegt.

SC series centering drill · SC Serie Zentrierbohrer (External coolant/ Kühlung)

CENTER LOCATING · ZENTRIERBOHREN

Workpiece material Werkstückstoff	Cast iron Grauguss		Nodular cast iron GGG		Silicon aluminium alloy Silizium Alu Legierung				Aluminum alloy Alu Legierung	
					Si≤10%		Si>10%			
Cutting speed	60~120m/min		50~100m/min		100~180m/min		80~140m/min		120~200m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)
5	6400	0.09~0.14	5100	0.09~0.14	9000	0.12~0.25	7600	0.12~0.25	10000	0.12~0.25
6	5300	0.12~0.16	4200	0.12~0.16	7400	0.14~0.28	6400	0.14~0.28	8500	0.14~0.28
8	4000	0.13~0.20	3200	0.13~0.20	5600	0.18~0.32	4800	0.18~0.32	6400	0.18~0.32
10	3200	0.17~0.25	2500	0.17~0.25	4500	0.22~0.36	3800	0.22~0.36	5000	0.22~0.36
12	2700	0.20~0.30	2100	0.20~0.30	3700	0.25~0.40	3200	0.25~0.40	4200	0.25~0.40
14	2400	0.22~0.32	1800	0.22~0.32	3200	0.27~0.44	2700	0.27~0.44	3600	0.27~0.44
16	2000	0.24~0.34	1600	0.24~0.34	2800	0.32~0.48	2400	0.32~0.48	3200	0.32~0.48
20	1600	0.28~0. 40	1300	0.28~0. 40	2300	0.40~0.60	1900	0.40~0.60	2550	0.40~0.60

1.The cutting conditions above are applicable for center drilling.
2.When the tool is used for the first time, please make a test cutting with 90% of cutting speed or 85% feed rate mentioned above. If the cutting conditions remain stable, gradually increase the cutting speed and feed rate.
3.The cutting conditions above are for drilling with emulsion.
4.Please reduce the feed speed when center drilling at inclined and curved face.
5.Use a collet without any defect or dust. The radial run-out of drill must be under 0.02mm.

1. Obige Schnittdatenempfehlungen gelten für das Zentrierbohren.
2. Beim ersten Einsatz 90% der empfohlenen Schnittgeschwindigkeit oder 85% des Vorschubes wählen. Bei stabiler Bearbeitung die Schnittdaten entsprechend erhöhen.
3. Die obigen Schnittdatenempfehlung basieren auf dem Einsatz von Emulsion.
4. Beim Bohren in sehr großen schrägen und ungeraden Flächen, Schnittdaten reduzieren.
5. Keine defekte Werkzeugaufnahme wählen. Die Rundlaufgenauigkeit muss unten 0,02mm liegen.

CHAMFERING · FASEN

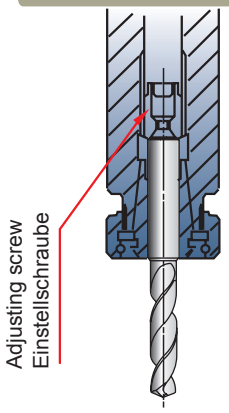
Workpiece material Werkstückstoff	Cast iron Gusseisen		Nodular cast iron GGG		Silicon aluminium alloy				Aluminum alloy Alu. Leg.	
					Si≤10%		Si>10%			
Cutting speed	90~180m/min		70~150m/min		150~270m/min		120~210m/min		180~300m/min	
Diameter (mm)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)	Rotating speed (min^{-1})	Feed rate (mm/r)
5	9600	0.09~0.20	7600	0.09~0.20	13500	0.12~0.30	11500	0.12~0.30	15000	0.12~0.30
6	8000	0.12~0.22	6400	0.12~0.22	11100	0.14~0.34	9600	0.14~0.34	12700	0.14~0.34
8	6000	0.13~0.28	4800	0.13~0.28	8400	0.18~0.40	7200	0.18~0.40	9600	0.18~0.40
10	4800	0.17~0.32	3800	0.17~0.32	6800	0.22~0.44	5700	0.22~0.44	7600	0.22~0.44
12	4000	0.20~0.38	3200	0.20~0.38	5600	0.25~0.50	4800	0.25~0.50	6400	0.25~0.50
14	3600	0.22~0.42	2700	0.22~0.42	4800	0.27~0.56	4000	0.27~0.56	5400	0.27~0.56
16	3000	0.24~0.46	2400	0.24~0.46	4200	0.32~0.60	3600	0.32~0.60	4800	0.32~0.60
20	2400	0.28~0.58	1900	0.28~0.58	3500	0.40~0.76	2850	0.40~0.76	3800	0.40~0.76

1.When the tool is used for the first time, please make a test cutting with 90% of cutting speed or 85% feed rate mentioned above. If the cutting conditions remain stable, gradually increase the cutting speed and feed rate.
2.The cutting conditions above are applicable for chamfer drilling.
3.The cutting conditions above are for drilling with emulsion.
4.Use a collet without any defect or dust. The radial run-out of drill must be under 0.02mm.

1. Beim ersten Einsatz 90% der empfohlenen Schnittgeschwindigkeit oder 85% des Vorschubes wählen. Bei stabiler Bearbeitung die Schnittdaten entsprechend erhöhen.
2. Obige Schnittdatenempfehlungen gelten für das Fasen.
3. Die obigen Schnittdatenempfehlung basieren auf dem Einsatz von Emulsion.
4. Keine defekte Werkzeugaufnahme wählen. Die Rundlaufgenauigkeit muss unter 0,02mm liegen.

Application guide of drills · Einsatzhinweise

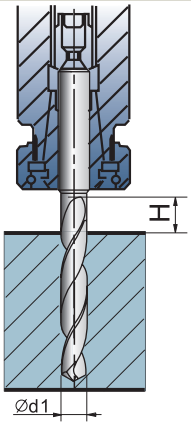
Drill clampling
Bohrer Aufnahme



Guarantee tight clamping by useing thrust bearing Type collet chuck.

Präzisionsspannzangen verwenden.

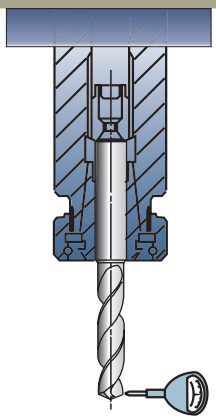
Max. drill length
Max. Bohrtiefe



Ensure the size of H is over 1.5d1

Abstand H =1.5d

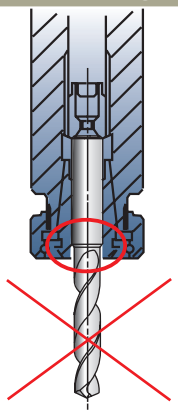
Radial Run-out
Rundlauftoleranz



The Radial Run-out should be under 0.02mm.

Rundlaufabweichung < 0,02mm

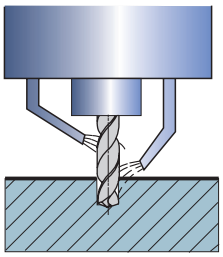
Wrong drill clamping
Ungünstige Bohrer-klemmung



Don't clamp on the drill flutes.

Bitte nicht auf den Nuten spannen

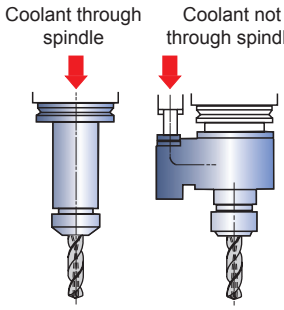
External: coolant method
Extern Kühlmittelzufuhr



The coolant liquid should shoot to the end and the center of drill as shown in the figure.

Zwei Kühlmittelleitungen sind ideal. (Bohrerspitze und Bohrer, wie in der Abb. oben)

Internal; coolant method
Intern Kühlmittelzufuhr



Coolant pressure is about 0.5~1mpa (coolant pressure is 2~3mpa when the diameter is less than Ø5 mm)
Coolant volume is 1.5~4L/min.

Kühlmitteldruck ist ca. 0,5-1 mmpa (bei Durchmesser unter 5mm, Kühlmitteldruck auf 2-3 mpa erhöhen)
Kühlmittelmenge: 1,5-4L/min

Cautions to use coolant
Handling mit Kühlmittel

When using Internal Coolant

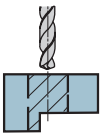
1. The little chip particles and dust will generate jamming in the oil hole. A fine mesh filter should be used to prevent jamming in the oil hole , especially for the small diameter drills.

2. Dirt and dust particles will adhere to the oil hole and lead to unsmooth coolant flow. Coolant change as early as possible is recommended.

1. Kleine Partikel können die Kühlmittelbohrungen verstopfen. Verwenden Sie daher bitte einen Kühlmittelfilter.

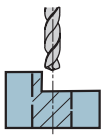
2. Stark verschmutztes Kühlmittel reduziert den Spanfluss. Wir empfehlen ein regelmäßiges Wechseln. Bitte prüfen Sie die einwandfreie Kühlmittelzufuhr.

Interrupted cutting
unterbrochene Bearb.



Reduce the feed rate when drilling interrupted cut.

Reduzieren Sie den Vorschub an der unterbrochenen Stelle.

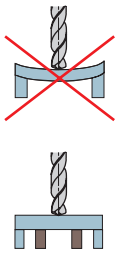


Pre-machining prior drilling
Vorbear-beitung

Machining a countersink with end mill prior to drilling.

Bearbeiten Sie die Fläche vor.

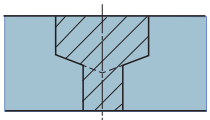
Thin workpiece
Dünne Werkstücke



Bending occurs Add a supporter.

Wenn dünne Werkstücke sich verbiegen, verwenden Sie Hilfsmittel.

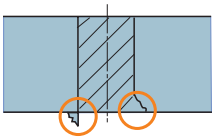
Stepped holes
Stufenbohrung



1.Divided to two drilling processes.
2.Drill the larger diameter hole firstly.
3.Multiple step and chamfer drill can be produced by us.

1. Geteilt in 2 Prozesse
2. Bohren Sie das größere Loch zuerst.
3. Auf Anfrage bieten wir auch Stufenbohrer an, die Stufenbohrungen in einem Prozess herstellen können.

burrs and workpiece chippings on Exit
Gratbildung oder Ausbrüche beim Austritt des Bohrers

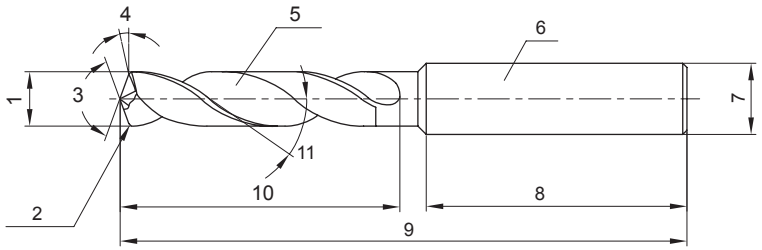


1.Reduce the feed rate at the end time of drilling through
2.Chamfer machined at the exit position.
3.Change the point angle.

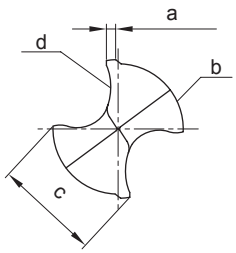
1. Reduzieren Sie den Vorschub um ca. die Hälfte beim Austritt.
2.Schleifen Sie eine Fase an den Bohrer.
3. Tauschen Sie den Spitzenwinkel.

Parts terminology of drill · Terminologie von VHM Bohrern

Version · Ausführung



1. Drilling diameter	1. Bohrdurchmesser
2. Chamfer	2. Fase
3. Point angle	3. Spitzenwinkel
4. Clearance angle	4. Freiwinkel
5. Chip pocket	5. Spanraum
6. Shank	6. Schaft
7. Shank diameter	7. Schaftdurchmesser
8. Shank length	8. Schaftlänge
9. Overall length	9. Gesamtlänge
10. Flute length	10. Schneidenlänge
11. Helical angle	11. Spiralwinkel



a. Margin width	a. Fasenbreite
b. Body clearance	b. Körper Freischliff
c. Land width	c. Primärfasenbreite
d. Primary cutting edge	d. Hauptschneide

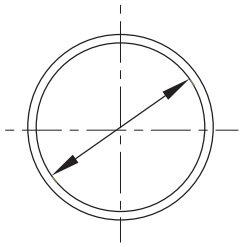
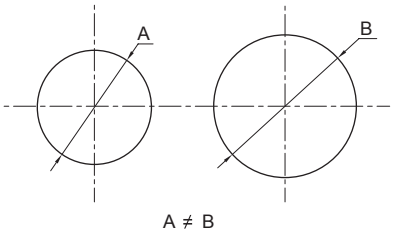
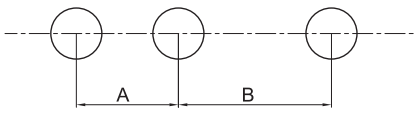
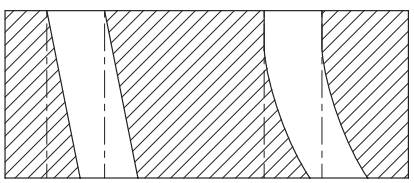
Cutting edge shapes · Schneidkanten- Ausführung

Shape Schneidkanten-ausführung	(Conical · konisch)	(Dual flats · flach)	(Candler · Zentrierspitze)
Features Merkmale	• The flank face is conical and the clearance angel increases toward the center of drill. • Wide applications, commonly used both for soft and hard materials. • Die Flanke ist konisch und der Freiwinkel vergrößert sich zur Bohrermitte. • Gebräuchliche Form für weiche und harte Materialien.	• The flank face is dual flats, to facilitate cutting and initial entering. • often used for small diameter dirlls • Flache Flanke für leichte Zerspanung. • Diese Form ist geeignet für Bohrer mit kleinem Durchmessern.	• This shape has two-stage point angle and perfect centering capability, less burs generate when drilling hole. • It is the first choice for drilling thin plate. • Diese Form hat 2 Winkelpunkte, für bessere Zentrierung und Reduzierung der Gratbildung. • Geeignet für Stahlrahmen- und Blechbearbeitung.

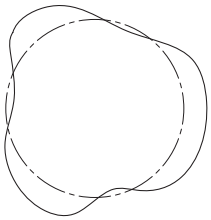
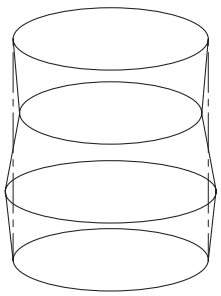
Structure specification and cutting characteristics · Bohrerspezifikation und Schnittwerte

Chip pocket **Spanraum**	The function of chip pocket is to remove the chips out of the hole. The larger the cross-sectional area is, the chips is easier to remove out. Durch den Spanraum werden die Späne während der Bearbeitung aus der Bohrung geleitet.
Helical angle **Spiral-winkel**	The helical angle is the inclined angle of flute at the axial direction of a drill. It varies according to the different position of cutting edge. It decreases greatly as the periphery toward the center. Spiralwinkel beschreibt die Steigung der Spiralnute. Der Spiralwinkel wird entsprechend dem zu bearbeitenden Material ausgelegt. High hardness material — Small ⟵ Helical angle ⟶ Large — soft material Hochvergütetes Material — klein ⟵ Spiralwinkel ⟶ groß — weiches Material
Flute length **Schneiden-länge bzw. Spirallänge**	It is determined by depth of hole, guide bush length and regrinding allowance. The longer the flute is, the worse the drill rigidity is. Since it greatly influences on the tool life, to minimize it as much as possible when other requirements are met. The minimal flute length generally is hole depth plus the 1.5 times of hole diameter. Die Schneidenlänge muss die Bohrungstiefe, die Führungsbuchsenlänge und die Gesamtnachschleiflänge berücksichtigen. Je länger der Spiralwinkel, desto geringer die Bohrerstabilität. Da hierdurch die Standzeit stark beeinflusst wird, sollte sie so kurz wie möglich gewählt werden. Die empfohlene minimale Spirallänge sollte: Bohrungstiefe +1,5 x Durchmesser sein
Point angle **Spitzen-winkel**	Generally the angle is 140°, it is set differently as per various applications. der Spitzenwinkel beträgt normalerweise 140°, er kann jedoch je nach Anwendung unterschiedlich sein. Soft material easy to cut — Small ⟵ Point angle ⟶ Large — for hard materials and high-efficiency machining klein ⟵ Spitzenwinkel ⟶ hohe Axialkraft, hohe Stabilität, gehärtetes Material und Hochleistungsbohren
Core **Kerndurch-messer**	It is an important factor that influence the rigidity and chip control of a drill. It is set according to applications. Low axial cutting force, Low rigidity, Materials easy to cut — thin ⟵ core ⟶ thick — Large axial cutting force, High rigidity, High hardness materials, cross hole drilling etc. Ist ein wichtiger Faktor und hat Einfluß auf die Stabilität und Spankontrolle: geringe Axialkraft, geringe Stabilität, leicht zu zerspanendes Material — klein ⟵ Seele ⟶ groß — hohe Axialkraft, hohe Stabilität, gehärtetes Material oder Querbohrungen.
Margin **Fasen-breite**	As a drill guide during drilling process. The margin width need to take the hole friction into consideration. small ⟵ margin width ⟶ large Fasenbreite beeinflußt die Führung und Friktion des Bohrers während der Bearbeitung. klein ⟵ Fasenbreite ⟶ groß niedrige Friktion und Bohrer Führung ⟵ Fasenbreite ⟶ hohe Friktion und gute Bohrerführung
Back taper Bohrer-durchmesser-winkel	To decrease the friction with inside wall of the drilled hole, there is a back taper slightly from tool nose to shank. The degree is usually represented by the quantity decreasing in the diameter per 100 mm flute length. Zur Reduzierung der Reibung während der Bearbeitung wird der Bohrerdurchmesser von der Schneide bis zum Schaft leicht reduziert.
Body clearance Körperfrei-schliff	It is the part formed on the clearance face after margin, mainly to reduce the friction between inside wall of hole and drill periphery Beschreibt den Bohrer hinter der Fasenbreite. Der Freischliff ist notwendig, um die Reibung des Bohrers während der Bearbeitung zu reduzieren.

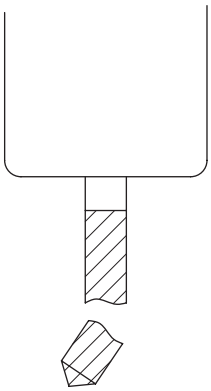
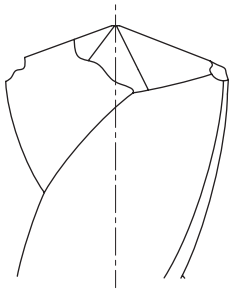
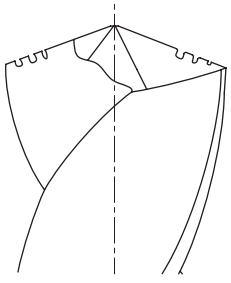
Common problems and solutions · Allgemeine Fehlerbehebungen

	Problem · Fehler	Cause · Ursache	Solution · Lösung
Hole · Bohrung	Oversize holes Bohrung zu groß 	Poor clamping Large run-out around spindle Ungenügende Werkstück bzw. Werkzeug Klemmung. großer Rundlauffehler Querschneide ist außer Mitte	Select a holder and chuck with high precision Calibrating spindle Check and adjust after clamping drill Präzisions-Klemmung verwenden. Spindelspiel reduzieren. Bohrer im geklemmten Zustand prüfen und justieren.
		Non-symmetric point angle Large run-out Chisel edge is off center Kein semetrischer Spitzenwinkel, großer Rundlauffehler Querschneide ist außer Mitte.	Regrind drill Check the precision after regrinding Bohrer nachschleifen, Nachschliff prüfen
	Irregular hole size Ungleichmäßiger Bohrungsmaße  A ≠ B	Non-symmetric point angle Large run-out Chisel edge is off center Excessive margin wear Kein semetrischer Spitzenwinkel, großer Rundlauffehler Querschneide ist außer Mitte. Hoher Verschleiß	Select the holder and chuck with high precision Calibrating the spindle Check and adjust after clamping drill Präzisions-Klemmung verwenden. Spindelspiel reduzieren. Bohrer im geklemmten Zustand prüfen und justieren.
		Poor clamping Large spindle run-out Workpiece is unfirmly hold. Ungenügende Werkstück/Werkzeug-Klemmung. großer Rundlauffehler Querschneide ist außer Mitte Hoher Verschleiß	Select the holder and chuck with high precision Calibrating spindle Check and adjust after clamping drill Präzisions-Klemmung verwenden. Spindelspiel reduzieren. Bohrer im geklemmten Zustand prüfen und justieren.
		Feed rate is too high Vorschub zu hoch	Reduce the feed speed Vorschub reduzieren
		Coolant is not enough Kühlmittel nicht ausreichend	Change the coolant supply method, or increase coolant volume. Kühlmittelmenge erhöhen
	Low position accuracy schlechte Bohrer Positionierung  A ≠ B	Poor re-positioning precision of spindle.Poor clamping Large run-out with spindle Unzureichende Klemmung sowie Spindel Positionierung. Großer Rundlaufabweichung der Spindel.	Improve the re-positioning precision of machine Select the holder and chuck with high precision Calibrating the spindle Check and adjust after clamping drill Positionierung der Maschine verbessern Präzisions-Klemmung verwenden. Spindel kalibrieren, Bohrer im geklemmten Zustand prüfen und justieren.
		The feed direction is not vertical to the workpiece surface Die Vorschubrichtung ist nicht vertikal zur Werkstückfläche	Adjust the feed direction vertical to the workpiece. Vorschubrichtung vertikal zur Werkstückoberfläche einstellen.
		Top center not align with the spindle center (lathe) Werkzeugmitte nicht auf Spindelmitte ausgerichtet (Drehmaschine)	Check and adjust alignment carefully before drilling Werkzeugmitte ausrichten
	Bad linearity Bad perpendicularity Schlechter Bohrungsverlauf 	Excessive tool wear hoher Werkzeugverschleiß	Regrind Nachschleifen
		Poor center hole accuracy schlechte Bohrungsgenauigkeit	Increase the position accuracy of hole Bohrungspositionierung verbessern
		Non-symmetric point angle Large run-out Chisel edge is off center Kein semetrischer Spitzenwinkel, großer Rundlauffehler Querschneide ist außer Mitte.	Regrind drill Check the precision after regrinding Bohrer nachschleifen, Nachschliff prüfen
		Insufficient drill rigidity Unzureichende Bohrerstabilität	Increase drill rigidity Bohrerstabilität verbessern
		Uneven workpiece surface Top center ders not align with the spindle center (lathe) Unebene Werkstückoberfläche Werkzeugmitte nicht auf Spindelmitte ausgerichtet (Drehmaschinen)	The workpiece must be horizontal or pre-machined to horizontal before drilling Pre-drill a center hole Das Werkstück muss vor dem Bohren horizontal ausgerichtet bzw. vorbearbeitet werden.

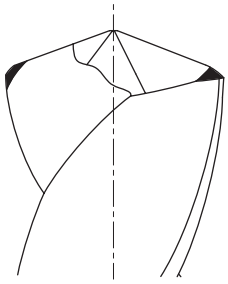
Common problems and solutions· Allgemeine Fehlerbehebungen

	Problem · Fehler	Cause · Ursache	Solution · Lösung
Hole Bohrung	Poor roundness Ungenaue Bohrung (Rundheit) 	Non-symmetric point angle Large drill run-out Chisel edge is off center Kein semetrischer Spitzenwinkel, großer Rundlauffehler, Zentrumschneide ist außer Mitte. Hoher Verschleiß	Regrind drill Check the precision after regrinding Bohrer nachschleifen, Nachschliff prüfen
		Poor clamping Large spindle run-out Workpiece is unfirmly hold Unzureichende Klemmung (Werkstück, Werkzeug).Großer Rundlaufabweichung der Spindel.	Select the holder and chuck with high precision Calibrating the spindle Check run-out and adjust after clamping drill Präzisions-Klemmung verwenden. Spindel kalibrieren, Bohrer im geklemmten Zusand auf Rundlauf prüfen und justieren.
		Clearance angle is too large Freiwinkel zu groß	Regrind drill Bohrer nachschleifen
		Insufficient drill rigidity Ungenügende Bohrerstabilität	Increase drill rigidity Bohrerstabilität verbessern
	Poor workpiece surface quality Schlechte Werkstückoberflächenqualität	Incorrect regrinding Schlechter Bohrer Nachschliff	Regrind calibration Nachschliff verbessern
		Insufficient coolant or unsuitable coolant Type Ungenügende Kühlmittelmenge bzw. Methode.	Change coolant supply method, increase coolant volume Select the cutting oil with good lubricating property Kühlmittelzuführungsmethode ändern Kühlmittelmenge erhöhen.
		Poor clamping Large spindle run-out Unzureichende Klemmung, großer Spiralrundlauffehler.	Select the holder and chuck with high precision Calibrating the spindle Präzisions-Klemmung verwenden. Spindel kalibrieren
		Feed rate is too high Vorschub zu hoch	Decrease the feed rate Vorschub verringern
		Excessive wear on cutting edge Excessive build-up on margin Großer Schneiden Verschleiß, große Aufbauschneidenbildung	Regrind drill Select a coated drill Bohrer nachschleifen, beschichtete Bohrer verwenden.
		Chip jamming Schlechte Spanabfuhr	Select a suitable drill (considering flute geometry , helical angle etc) Change the cutting method (adjust feed rate, use step feed etc) Einen geeigneten Bohrer wählen (mit entsprechender Spannute, Spiralwinkel etc.) Schnittgeschw. anpassen (Vorschub verringern usw.)
	Poor cylindricity Schlechte Zylindrizität 	Non-symmetric point angle Large drill run-out Chisel edge is off center Excessive margin wear Kein semetrischer Spitzenwinkel, großer Rundlauffehler (Bohren) Zentrumschneide ist außer Mitte. großer Schneidenverschleiß	Regrind drill Check the precision after regrinding Bohrer nachschleifen, Nachschliff prüfen
		Feed speed is too low Vorschub zu gering	Increase the feed speed Vorschub erhöhen

Common problems and solutions · Allgemeine Fehlerbehebungen

	Problem · Fehler	Cause · Ursache	Solution · Lösung
Drill Bohrer	Drill breakage Bruch des Bohrers 	In sufficient clamping of tool and/or workpiece Nicht ausreichende Spannung des Werkzeuges und/oder Werkstückes.	Increase the rigidity of drill, machine, workpiece and clamp Stabilität des Werkzeuges sowie Spannung des Werkzeuges bzw. Werkstückes verbessern
		Clearance angle is too small Freiwinkel zu klein	Use drill will bigger clearance angle or regrind. Bohrer mit größerem Freiwinkel verwenden oder nachschleifen
		Feed rate is too high Vorschub zu hoch	Decrease the feed rate Vorschub verringern
		Excessive drill wear Großer Verschleiß	Regrind drill Bohrer nachschleifen
		Chip jamming Spänestau	Select a suitable drill (considering flute geometry , helical angle etc) Change the cutting method (adjust feed rate, use step feed etc) Einen geeigneten Bohrer wählen (mit entsprechender Spannute, Spiralwinkel etc.) Schnittgeschw. anpassen (Vorschub verringern, Bohrer lüften usw.)
		Difficult entering the workpiece Schwieriges Anbohren	Increase the rigidity of drill and machine Increase rigidity of workpiece and clamping. Select the drill with a sharp point for easy entry Pre-drill a centre hole. Adjust the level of workpiece or pre-machined to horizontal before drilling. Use guide bush or bush plate Stabilität des Werkzeuges sowie Spannung der Maschine und Werkstückes verbessern. Bohrer mit scharfer Zentrierschneide. Pilotbohrung setzten. Anbohrwinkel korrigieren oder gerade Fläche fräsen. Einsatz einer Führungsbuchse.
	Chipping on the cutting corner Ausbröcklung am Bohrer 	Hard skin or porons spot Harte Oberfläche oder Lunker	Analyse the workpiece or select a suitable grade Change the cutting parameters(cutting speed , feed rate or machining method) Werkstoff prüfen und entsprechende Sorte auswählen. Schnittbedingungen ändern (Schnittgeschw., Vorschub oder Bearbeitungsmethode)
		Feed rate is too high Vorschub zu hoch	Decrease the feed rate Vorschub verringern
		Insufficient coolant Zu wenig Kühlmittel	Change coolant supply method, increase coolant volume Kühlmittelzufuhr verbessern/ erhöhen
	Chipping on cutting edge Ausbröcklung an der Schneide 	Poor clamping Large spindle run-out schlechte Spannung großer Spiralrundlauf	Select the holder and chuck with high precision Calibrating the spindle Spanmittel mit höhere Präzision verwenden. Spindel neu ausrichten.
		Cutting speed and feed speed are too high Decrease the feed rate Schnittgeschwindigkeit und Vorschub zu hoch	Reduce the cutting speed and feed speed. Schnittgeschwindigkeit und Vorschub reduzieren.
		Clearance angle is too large Freiwinkel zu groß	Regrind calibration Bohrer mit kleinerem Freiwinkel verwenden oder nachschleifen

Common problems and solutions · Allgemeine Fehlerbehebungen

	Problem · Fehler	Cause · Ursache	Solution · Lösung
Drill Bohrer	Abnormal wear on cutting corner Übermäßiger Verschleiß 	Delay to regrind Überfälliger Nachschliff	Regrind in time Frühzeitiger Nachschliff
		Drill point does not align with the spindle center (lathe) Bohrerspitze steht nicht mittig	Check and adjust alignment carefully before drilling Bohrerposition auf Spindelmitte justieren.
		Cutting speed is too high Schnittgeschwindigkeit zu hoch	Reduce cutting speed Schnittgeschwindigkeit reduzieren
		Cutting edge shape is inappropriate Schneidwinkel nicht geeignet	Select correct cutting edge shape Richtigen Schneidwinkel wählen.
		Unsuitable drill material Schneidstoff ungeeignet	Select the suitable drill material Geeigneten Schneidstoff wählen
		Incorrect coolant Type Unzureichende Kühlung	Change coolant Ausreichende Kühlung verwenden
	Wear and chipping on chisel edge Verschleiß und Ausbrüche an Querschneide	Feed speed is too high Vorschub zu hoch	Reduce feed speed Vorschub reduzieren
		Cutting edge shape is inappropriate Schneidwinkel nicht geeignet	Select correct cutting edge shape Richtigen Schneidwinkel wählen.
		Unsuitable drill material Freiwinkel zu gering	Select the suitable drill material Geeigneten Schneidstoff wählen.
		Clearance angle is too small Freiwinkel zu gering	Regrind drill Bohrer nachschleifen
	Breakage on margin Bruch der Führungsfase	The size of guide bush or drill bush is too large Führungsbuchse zu groß	Select another bush with correct size Führungsbuchse austauschen
	Margin build-up Aufbauschneide an der Führungsfase	Excessive wear on cutting edge generates high heat Hoher Verschleiß und Hitze	Regrind drill Bohrer nachschleifen
		Insufficient coolant Unzureichende Kühlung	Change coolant supply method, increase coolant volume Kühlmittelzufuhr-Methode ändern
		Incorrect coolant Type falscher Kühlmittelschmierstoff	Change coolant Kühlschmierstoff ändern
		Workpiece material is too soft Ungünstig zu zerspanendes Material	Change drill or machining method Bohrer mit kleineren Freiwinkel wählen
	High vibration Hohe Vibrationen	Clearance angle is too large Freiwinkel zu groß	Regrind drill Bohrer nachschleifen
		Drill rigidity is not enough Bohrerstabilität zu gering	Increase drill rigidity Stabilität verbessern
	Chips roll around the drill Spänewickel	Long chips Chip removal is not fluent Lange Späne, Abfuhr unzureichend	Change the drill and adjust machining method and cutting parameters Schnittdaten optimieren, evt. Bohrer wechseln oder Maschine neu justieren
	One-side wear Einseitiger Verschleiß	Drill point does not align with the spindle center (lathe) Bohrerspitze steht nicht mittig	Check and adjust the alignment carefully before drilling Bohrerposition auf Spindelmitte justieren.
		Poor clamping Schlechte Spannung	Fix drill carefully, control the radial run-out Bohrerklemmung verbessern, Rundlauf kontrollieren.

NOTIZEN:

Non-standard Taylor made · Sonderwerkzeuge

Name:

Firma/Company:

Fax:

Tel:

E-MAIL:

Heltorfer Straße 12
40472 Düsseldorf Germany
Fax: +49-(0)211-989240-111
E-Mail:info@zccct-europe.com

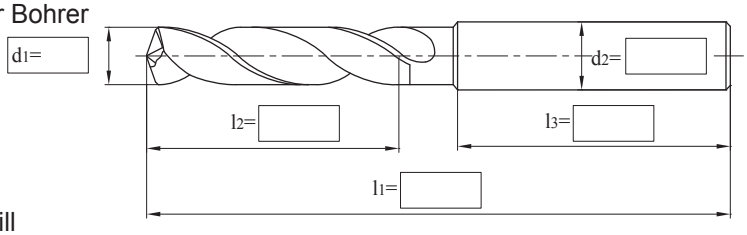
When the diameter or length of sample can't meet with your requirements, we will provide more specialized and precision non-standard making; Please fill the parameter, which you need, in the form.

Wenn die Standardabmessungen nicht reichen, bieten wir Ihnen Sonderausführungen nach Wunsch an. Bitte füllen Sie das entsprechende Formular aus.

Diameter Bohrer Ø	External Cooling	Ø0.3～Ø20.0mm
	Internal Cooling	Ø3.0～Ø20.0mm

Cooling/Kühlung
☐ External Cooling
☐ Internal Cooling

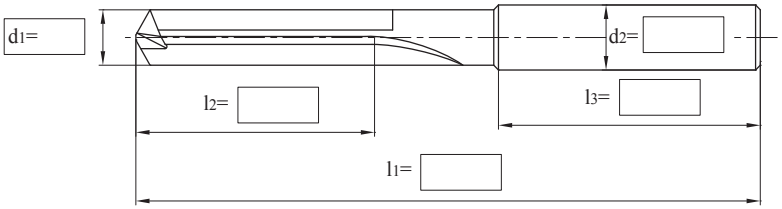
Twist drill
Spiral genuteter Bohrer



Selection of twist drill series
Spiralbohrerserie

☐ SU ☐ SH
☐ ST ☐ SC

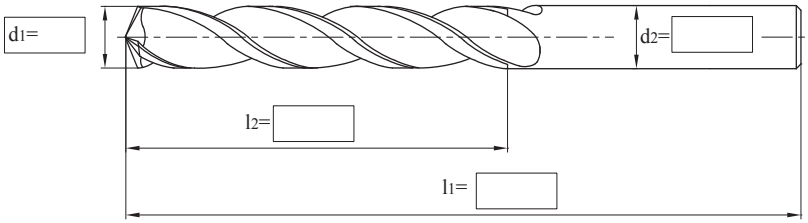
Straight-flute drill
gerade genuteter Bohrer



Selection of straight-flute drill series
Gerade genutete Bohrerserie

☐ PC

Three lips drill
drei Schneiden Bohrer



Selection of three-lips drill series
Drei Schneiden Bohrerserie

☐ PA

Remarks:
Bemerkungen:

Order quantity: piece
Auftragsmenge: Stück

Expected delivery date:
Ewartetes Lieferdatum:

Date · Datum:

Confirmation · Unterschrift:

Non-standard Taylor made · Sonderwerkzeuge

Name:

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E-Mail:info@zccct-europe.com

Machining information and Workpiece Material • Bearbeitungsinfo. und Werkstück Material

Size of machined hole Bohrungsdurchmesser ____ mm

Tolerance of machined hole Toleranz der Bohrung ____

Depth of machined hole Bohrtiefe ____ mm

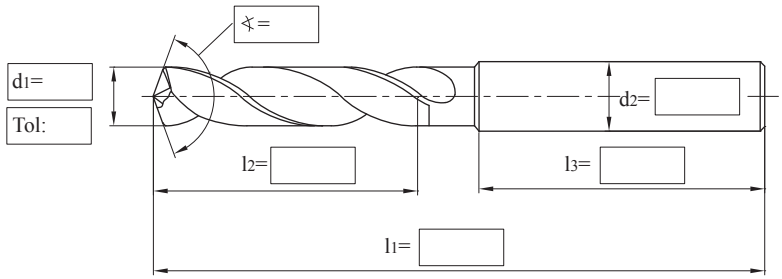
- ☐ Carbon steel Kohlenstoffstahl
- ☐ Alloy steel legierter Stahl
- ☐ Prehardened steel vergüteter Stahl
- ☐ Harden steel gehärteter Stahl
- ☐ Stainless steel rostfreier Stahl
- ☐ Grey cast iron GGG
- ☐ Nodular cast iron GGG
- ☐ Cooper alloy Kupferlegierung
- ☐ Alumium alloy / Alu leg.
- ☐ Titanium alloy Titanlegierung
- ☐ Heat resistance alloy/ Warmfeste leg.

Machined material trademark
Spezieller Werkstückstoff: ____

Tensile strength · Zugfestigkeit = ____ N/mm²

Hardness= Härte ____
unit: (HRC,HB etc.)

Tool information • Werkzeug Information:



Cooling/ Kühlung	
☐	External Cooling
☐	Internal Cooling

Coating/ Beschichtung	
☐	Yes/ Ja
☐	No/ Nein

DIN6535

Shank • Schaft

- ☐ Form HA
- ☐ Form HB
- ☐ Form HE
- ☐ Straight shank/ Zylinders.
- ☐ Shank with tang DIN 1809
- ☐ Morse taper shank ☐
- Special type

Remarks:
Bemerkungen:

Order quantity: piece
Auftragsmenge: Stück

Expected delivery date:
Ewartetes Lieferdatum:

Date · Datum:

Confirmation · Unterschrift:

Non-standard Taylor made · Sonderwerkzeuge

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Machining information and Workpiece Material • Bearbeitungsinfo. und Werkstück Material

Machined hole ☐ ☐

Size of small machined hole	mm	Ø kleine Bohrung
Tolerance of small machined hole		Toleranz der kleinen Bohrung
Size of big machined hole	mm	Ø große Bohrung
Tolerance of big machined hole		Ø Toleranz der großen Bohrung
Depth of machined hole	mm	Tiefe der großen Bohrung

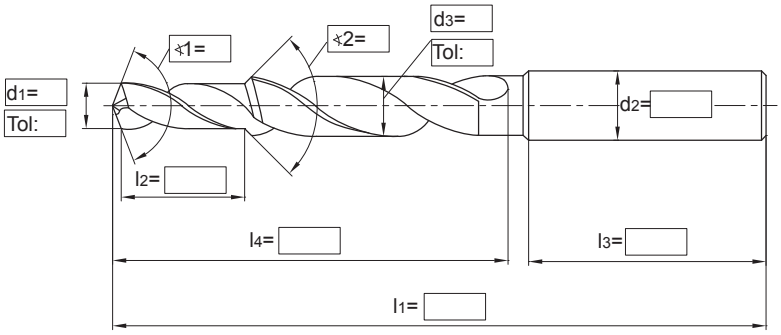
- ☐ Carbon steel / Kohlenstoffstahl
- ☐ Alloy steel / legierter Stahl
- ☐ Prehardend steel / vergüteter Stahl
- ☐ Harden steel / gehärteter Stahl
- ☐ Stainless steel / rostfreier Stahl
- ☐ Grey cast iron / Grauguss
- ☐ Nodular cast iron / GGG
- ☐ Cooper alloy / Kupferlegierung
- ☐ Alumium alloy / Alu leg.
- ☐ Titanium alloy / Titanlegierung
- ☐ Heat resistance alloy/ Warmfeste leg.

Machined material trademark
Spezieller Werkstoff:

Tensile Strength · Zugfestigkeit = N/mm²

Hardness= Härte
unit: (HRC,HB etc.)

Tool information • Werkzeug Information



Cooling/ Kühlung	Coating/ Beschichtung
☐ External Cooling	☐ Yes/ Ja
☐ Internal Cooling	☐ No/ Nein

DIN6535 — Shank • Schaft

- ☐ Form HA
- ☐ Form HB
- ☐ Form HE
- ☐ Straight shank/ Zylinders.
- ☐ Shank with tang DIN 1809
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- Special type

Remarks:
Bemerkungen:

Order quantity: piece
Auftragsmenge: Stück

Expected delivery date:
Ewartetes Lieferdatum:

Date · Datum:

Confirmation · Unterschrift:

Non-standard Taylor made · Sonderwerkzeuge

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Machining information and Workpiece Material • Bearbeitungsinfo. und Werkstück Material

Size of machined hole
Bohrungsdurchmesser ____ mm

Tolerance of machined hole
Toleranz der Bohrung ____

Depth of machined hole
Bohrtiefe ____ mm

- ☐ Grey cast iron
  Grauguss
- ☐ Nodular cast iron
  GGG
- ☐ Aluminium alloy
  Alu leg.
- ☐ Si Al alloy Si＜10%
  Si Alu leg.
- ☐ Si Al alloy Si≥10%
  Si Alu legierung

Machined material trademark
Spezieller Werkstoff:

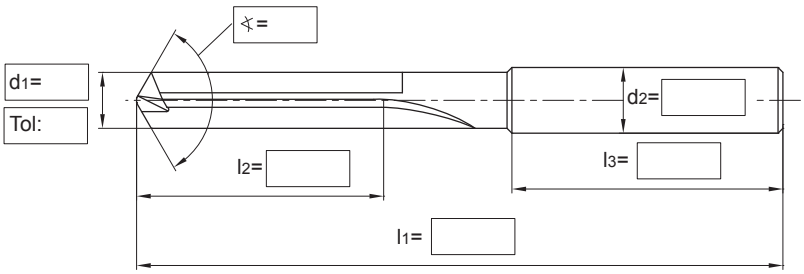
Tensile Strength · Zugfestigkeit:
N/mm²

Hardness · Härte:

The straight-flute drill is widely used for cutting short ship materials from cast iron and common Al alloy to high Si Al alloy

Gerade genutete Bohrer werden weitesgehend für die Bearbeitung von Gusseisen und Alu leg. bis Si Alu Leg. eingesetzt.

Tool information • Werkzeug Information:



Cooling/ Kühlung	
☐	External Cooling
☐	Internal Cooling

Coating/ Beschichtung	
☐	Yes/ Ja
☐	No/ Nein

Shank • Schaft

DIN6535

- ☐ Form HA
- ☐ Form HB
- ☐ Form HE
- ☐ Straight shank/ Zylinders.
- ☐ Shank with tang DIN 1809
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- Special type

Remarks:
Bemerkungen:

Order quantity: piece
Auftragsmenge: Stück

Expected delivery date:
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Non-standard Taylor made · Sonderwerkzeuge

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Fax: +49-(0)211-989240-111
E-Mail:info@zccct-europe.com

Machining information and Workpiece Material • Bearbeitungsinfo. und Werkstück Material

Machined hole
Bohrung ☐ ☐

Size of small machined hole kleiner Lochdurchmesser		mm
Tolerance of small machined hole Toleranz der Bohrung (klein)		
Size of big machined hole großer Lochdurchmesser		mm
Tolerance of big machined hole Toleranz der Bohrung (groß)		
Depth of machined hole Bohrtiefe		mm

☐ Grey cast iron
Grauguss
☐ Nodular cast iron
GGG
☐ Aluminium alloy
Alu leg.
☐ Si Al alloy Si＜10%
Si Alu leg.
☐ Si Al alloy Si≥10%
Si Alu legierung

Machined material
Spezieller Werkstoff:

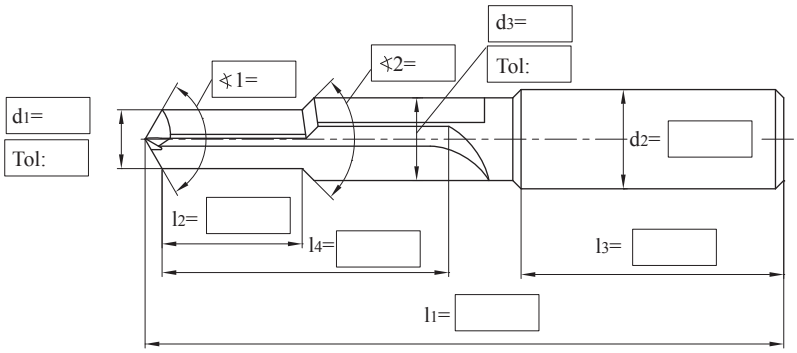
Tensile Strength · Zugfestigkeit:
N/mm ^{2}

Hardness · Härte:

The straight-flute drill is widely used for cutting short materials from cast iron and common Al alloy to high Si Al alloy

Gerade genutete Bohrer werden weites gehend für die Bearbeitung von Gusseisen und Alu leg. bis Si-Alu-Leg. eingesetzt.

Tool information • Werkzeug Information:



Cooling/ Kühlung	
☐	External Cooling
☐	Internal Cooling

Coating/ Beschichtung	
☐	Yes/ Ja
☐	No/ Nein

DIN6535

Shank • Schaft

☐ Form HA
☐ Form HB
☐ Form HE
☐ Straight shank/ Zylinders.
☐ Shank with tang DIN 1809
☐ Morse taper shank ☐
Special type

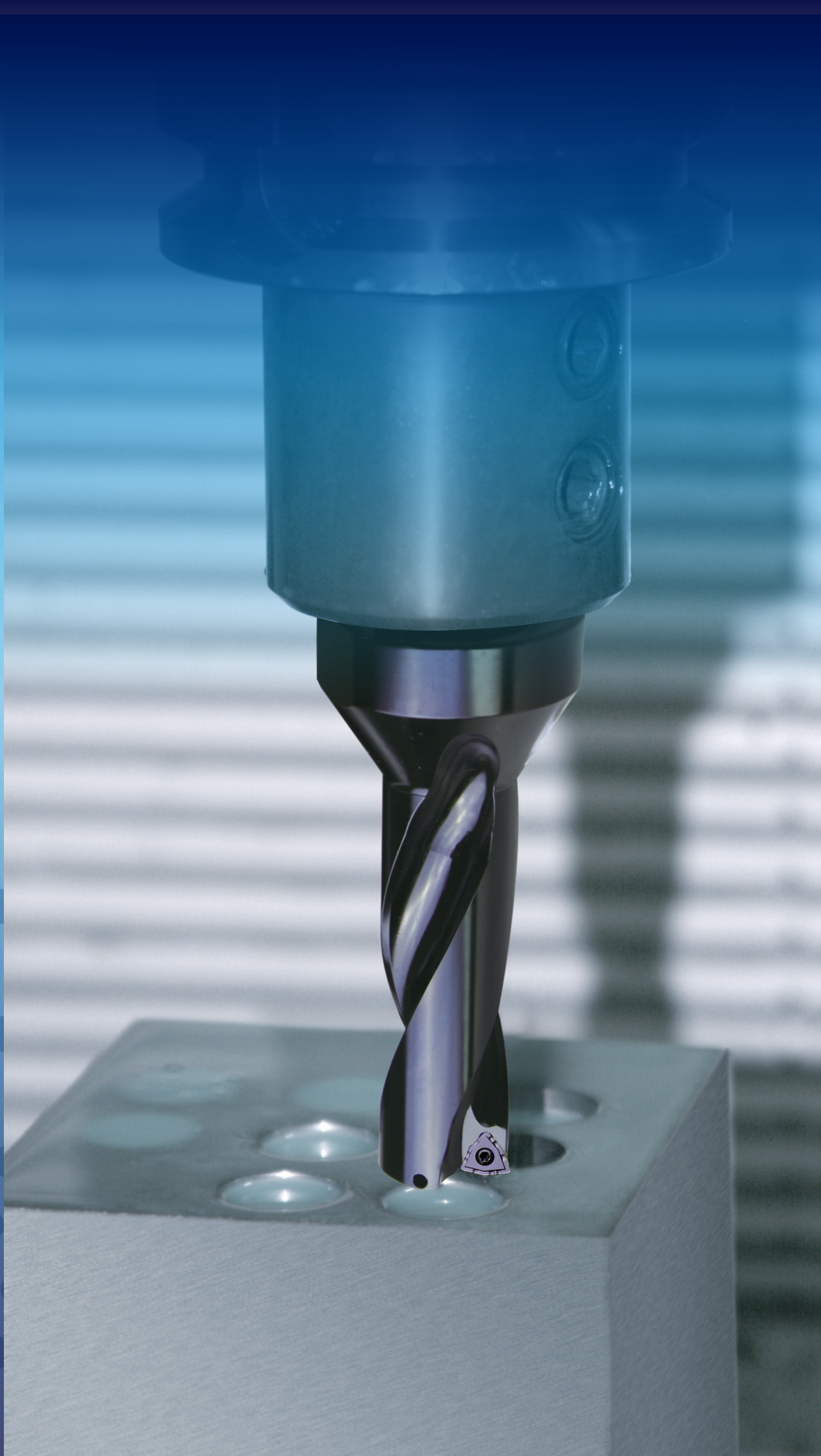
Remarks:
Bemerkungen:

Order quantity: piece
Auftragsmenge: Stück

Expected delivery date:
Lieferdatum:

Date · Datum:

confirmation · Unterschrift:



Indexable drill Code Key · ISO Kennzeichnung WSP-Bohrern

The ratio of length and diameter L zu D Verhältnis

02	03	04	05

Diameter Durchmesser

Range	160-580
	16mm-58mm

Insert shape WSP Form

W	
S	

Insert clearance angle WSP Freiwinkel

C	7°
P	11°

Cutting edge length Schneiden-länge (mm)

Code	Length Länge	
	W	S
03	3.8	
04	4.3	
05	5.4	
06	6.5	6.35
08	8.7	8.0
09		9.525
12		12.7

ZD-03300-XP-32WC05-02

Tool Type Werkzeugtyp

Code	Description
ZD	Indexable drill

Coupling structure and Type Kupplungsart

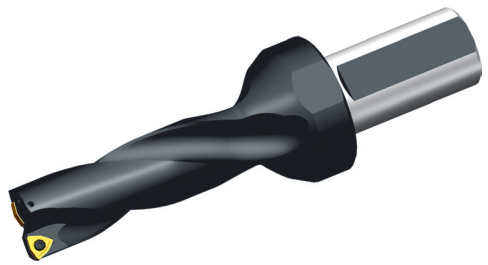
Code	Description
XP	Weldon shank

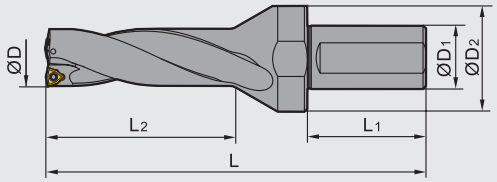
Coupling size(mm) Kupplungsgröße

25	32	40

Number of teeth Anzahl der Zähne

Indexable drill · WSP-Bohrer



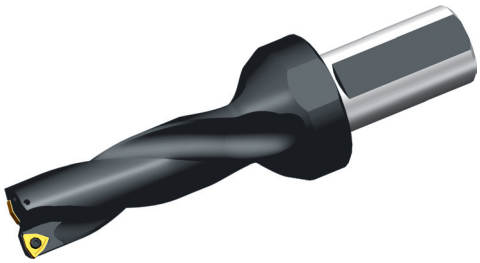


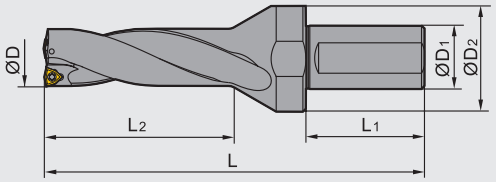
Type · Typ	Stock Lager	Basic dimension(mm) · Abmessungen						Inserts WSP	Screw Schraube	Wrench Schlüssel
		D	D1	D2	L1	L2	L			
ZD03-160-XP25-WC03-02	●	16	25	32	56	52	129	WCMX030208	I60M2.5×6.5	WT07IP
ZD03-170-XP25-WC03-02	●	17	25	32	56	55	133	WCMX030208	I60M2.5×6.5	WT07IP
ZD03-180-XP25-WC03-02	●	18	25	32	56	58	137	WCMX030208	I60M2.5×6.5	WT07IP
ZD03-190-XP25-WC03-02	●	19	25	32	56	61	140	WCMX030208	I60M2.5×6.5	WT07IP
ZD03-200-XP25-WC03-02	●	20	25	32	56	64	143	WCMX030208	I60M2.5×6.5	WT07IP
ZD03-210-XP25-WC04-02	●	21	25	45	56	67	153	WCMX040208	I60M2.5×6.5T	WT08IP
ZD03-220-XP25-WC04-02	●	22	25	45	56	70	156	WCMX040208	I60M2.5×6.5T	WT08IP
ZD03-230-XP25-WC04-02	●	23	25	45	56	73	159	WCMX040208	I60M2.5×6.5T	WT08IP
ZD03-240-XP25-WC04-02	●	24	25	45	56	76	162	WCMX040208	I60M2.5×6.5T	WT08IP
ZD03-250-XP25-WC04-02	●	25	25	45	56	79	165	WCMX040208	I60M2.5×6.5T	WT08IP
ZD03-260-XP32-WC05-02	●	26	32	55	60	83	176	WCMX050308	I60M3×7	WT09IP
ZD03-270-XP32-WC05-02	●	27	32	55	60	86	180	WCMX050308	I60M3×7	WT09IP
ZD03-280-XP32-WC05-02	●	28	32	55	60	89	184	WCMX050308	I60M3×7	WT09IP
ZD03-290-XP32-WC05-02	●	29	32	55	60	92	188	WCMX050308	I60M3×7	WT09IP
ZD03-300-XP32-WC05-02	●	30	32	55	60	95	192	WCMX050308	I60M3×7	WT09IP
ZD03-310-XP40-WC06-02	●	31	40	60	70	98	203	WCMX06T308	I60M3×7	WT09IP
ZD03-320-XP40-WC06-02	●	32	40	60	70	101	206	WCMX06T308	I60M3×7	WT09IP
ZD03-330-XP40-WC06-02	●	33	40	60	70	104	209	WCMX06T308	I60M3×7	WT09IP
ZD03-340-XP40-WC06-02	●	34	40	60	70	107	212	WCMX06T308	I60M3×7	WT09IP
ZD03-350-XP40-WC06-02	●	35	40	60	70	110	215	WCMX06T308	I60M3×7	WT09IP
ZD03-360-XP40-WC06-02	●	36	40	60	70	113	218	WCMX06T308	I60M3×7	WT09IP
ZD03-370-XP40-WC06-02	●	37	40	60	70	116	221	WCMX06T308	I60M3×7	WT09IP
ZD03-380-XP40-WC06-02	●	38	40	60	70	119	225	WCMX06T308	I60M3×7	WT09IP
ZD03-390-XP40-WC06-02	●	39	40	60	70	122	228	WCMX06T308	I60M3×7	WT09IP

● Ex Stock / ab Lager ○ On demand / auf Anfrage

● Ex Stock / ab Lager ○ On demand / auf Anfrage

Indexable drill · WSP-Bohrer





Type · Typ	Stock Lager	Basic dimension(mm) · Abmessungen						Inserts WSP	Screw Schraube	Wrench Schlüssel
		D	D1	D2	L1	L2	L			
ZD03-400-XP40-WC06-02	●	40	40	60	70	125	231	WCMX06T308	I60M3×7	WT09IP
ZD03-410-XP40-WC06-02	●	41	40	60	70	128	234	WCMX06T308	I60M3×7	WT09IP
ZD03-420-XP40-WC08-02	●	42	40	60	70	131	239	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-430-XP40-WC08-02	●	43	40	60	70	134	242	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-440-XP40-WC08-02	●	44	40	60	70	137	245	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-450-XP40-WC08-02	●	45	40	60	70	140	248	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-460-XP40-WC08-02	●	46	40	60	70	143	251	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-470-XP40-WC08-02	●	47	40	60	70	146	253	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-480-XP40-WC08-02	●	48	40	70	70	149	255	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-490-XP40-WC08-02	●	49	40	70	70	152	257	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-500-XP40-WC08-02	●	50	40	70	70	155	259	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-510-XP40-WC08-02	●	51	40	70	70	158	261	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-520-XP40-WC08-02	●	52	40	70	70	161	263	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-530-XP40-WC08-02	●	53	40	70	70	164	265	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-540-XP40-WC08-02	●	54	40	70	70	167	267	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-550-XP40-WC08-02	●	55	40	70	70	170	269	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-560-XP40-WC08-02	●	56	40	70	70	173	271	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-570-XP40-WC08-02	●	57	40	70	70	176	273	WCMX080412	I60M3.5×10.4	WT15IP
ZD03-580-XP40-WC08-02	●	58	40	70	70	179	275	WCMX080412	I60M3.5×10.4	WT15IP

● Ex Stock / ab Lager ○ On demand / auf Anfrage

Code key C98-99
ISO Kennzeichen

Cutting data 69-81
Schnittdaten

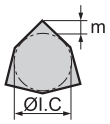
Technical Information C103-104
Technische Information.

Inserts rills Code Key · ISO Kennzeichnung Wendeschneidplatten

Insert shape · Plattenform

Code	Insert shap
S	
W	

Tolerance · Toleranz

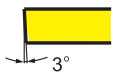
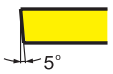
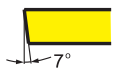
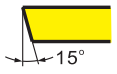
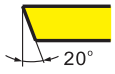
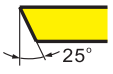
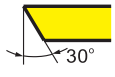
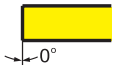
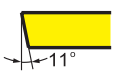




Code	Nose Height m Tolerance(mm)	Inscribed Circle ØI.C Tolerance(mm)	Thickness S Tolerance(mm)	Code	Nose Height m Tolerance(mm)	Inscribed Circle ØI.C Tolerance(mm)	Thickness S Tolerance(mm)
A	±0.005	±0.025	±0.025	J	±0.005	±0.05-±0.13	±0.025
F	±0.005	±0.013	±0.025	K	±0.013	±0.05-±0.13	±0.025
C	±0.013	±0.025	±0.025	L	±0.025	±0.05-±0.13	±0.025
H	±0.013	±0.013	±0.025	M	±0.08-±0.18	±0.05-±0.13	±0.13
E	±0.025	±0.025	±0.025	N	±0.08-±0.18	±0.05-±0.13	±0.025
G	±0.025	±0.025	±0.13	U	±0.13-±0.38	±0.08-±0.25	±0.13

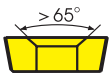
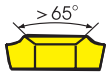
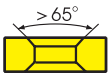
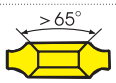
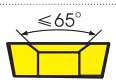
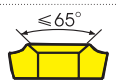
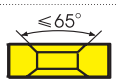
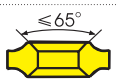
W C M X

Clearance angle of main cutting edge
Freiwinkel der Hauptschneide

Code	Clearance angle	Code	Clearance angle
A		B	
C		D	
E		F	
G		N	
P		O	Other clearance angle andere

Chipbreaker and clamping system
Spanformstufen und Klemmung

Metric · Metrisch

Code	With/Without hole/ Loch	With/Without chipbreaker	Section plane of Insert	Code	With/Without hole/ Loch	With/Without chipbreaker	Section plane of Insert
B	✔	-		N	-	-	
H	✔	Single-side Einseitig		R	-	Single-side Einseitig	
C	✔	-		F	-	Double-side Doppelseitig	
J	✔	Double-side Doppelseitig		A	✔	-	
W	✔	-		M	-	Single-side Einseitig	
T	✔	Single-side Einseitig		G	✔	Double-side Doppelseitig	
Q	✔	-		X	---	---	Special
U	✔	Double-side Doppelseitig					

Length of cutting edge
Schneidenlänge

Code	Length	
	W	S
03	3.8	
04	4.3	
05	5.4	
06	6.5	6.35
08	8.7	8.0
09		9.525
12		12.7

Insert thickness
Dicke



Thickness is defined as height from bottom of insert to the highest part of cutting edge

Code	Insert thickness WSP dick.(mm)	Code	Insert thickness WSP Breit.(mm)
00	0.79	**05**	5.96
T0	0.99	**T5**	5.95
01	1.59	**06**	6.35
T1	1.98	**T6**	6.75
02	2.38	**07**	7.94
T2	2.58	**09**	9.52
03	3.18	**T9**	9.72
T3	3.97	**11**	11.11
04	4.76	**12**	12.70
T4	4.96		

08 04 12 R – PG

Nose radius
Schneidenradius

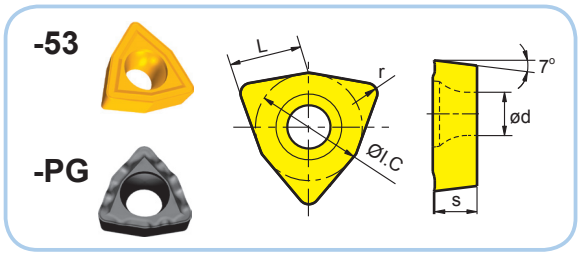
Code	Description
04	0.4mm
08	0.8mm
12	1.2mm

Cutting direction
Vorschubsrichtung

Code	Description
R	Right hand/ Rechts
L	Left hand/ Links
N	Neutral

Chipbreaker code
Spanformstufe

Indexable inserts for drilling · WSP zum Bohren



Ideal Machining Condition
Gute Bearbeitungsbedingungen

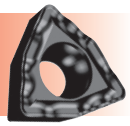
Normal Machining Condition
Normale Bearbeitungsbedingungen

Unfavorable Machining Condition
Ungünstige Bearbeitungsbedingungen

Workpiece Material Werkstoffe							
P	Steel/Stahl	◔	◔	◔	◔	◔	
M	Stainless Steel Rostfreier Stahl	◔	◔			◔	
K	Cast Iron Gusseisen	◔	◔	◔	◔	◔	
N	Non-ferrite material Ne Metalle						◔
S	Heat-resistant steel Warmfester Stahl	◔					

Type · Typ	Basic dimension(mm) · Basis Abmessungen					Grade · Sorte					
	L	I.C	s	d	r	YBG202	YBG205	YBG201	YBD252	YBG40	YD201
WCMX030208R-53	3.8	5.56	2.38	2.8	0.8	○		●	○	○	○
WCMX040208R-53	4.3	6.35	2.38	3.1	0.8	○		●	○	○	●
WCMX050308R-53	5.4	7.94	3.18	3.2	0.8	○		●	○	○	●
WCMX06T308R-53	6.5	9.525	3.97	3.7	0.8	○		●	○	○	●
WCMX080412R-53	8.7	12.7	4.76	4.3	1.2	○		●	○	○	●
WCMX030208-D	3.8	5.56	2.38	2.8	0.8				○	○	
WCMX040208-D	4.3	6.35	2.38	3.1	0.8				○	○	
WCMX050308-D	5.4	7.94	3.18	3.2	0.8				○	○	
WCMX06T308-D	6.5	9.525	3.97	3.7	0.8				○	○	
WCMX080412-D	8.7	12.7	4.76	4.3	1.2				○	○	
WCMX030208R-PG	3.8	5.56	2.38	2.8	0.8	●	○		○		
WCMX040208R-PG	4.3	6.35	2.38	3.1	0.8	●	○		○		
WCMX050308R-PG	5.4	7.94	3.18	3.2	0.8	●	○		○		
WCMX06T308R-PG	6.5	9.525	3.97	3.7	0.8	●	○		○		
WCMX080412R-PG	8.7	12.7	4.76	4.3	1.2	●	○		○		

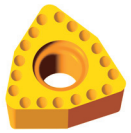
-PG chipbreaker
-PG Spanbrecher



Unique design of waveform edge ensure high edge strength and good chip breaking performance for machining carbon steel and alloy steel.

Wellenförmige Schneide mit hoher Stabilität und Spankontrolle zur Bearbeitung von Kohlenstoffstahl, legiertem Stahl und Guss

-D chipbreaker
-D Spanbrecher



Inserts for outer positioning with optimized chipbreaker geometriy. And good chip breaking performance for machining,steel, stainless steel, cast iron for common cutting speed .

Optimierte Geometrie als Außenschneide einsetzbar. Gute Spankontrolle bei Stahl, rostfreiem Stahl, Grauguss bei mittleren Schnittgeschwindigkeiten.

-53 chipbreaker
-53 Spanbrecher



Sharp cutting edge benefits to achieve low roughness surface, mainly applicable for low load cutting of aluminum alloy, mild steel, stainless steel and cast iron.

Scharfe Schneidkante zur Erziehlung exclusiver Oberflächen. Zur Bearbeitung von Alu-Legierungen, Baustahl, rostfreiem Stahl und Grauguss.

● Ex Stock / ab Lager ○ On demand / auf Anfrage

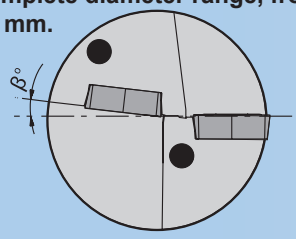
Comparison table for drilling Insert - Grades
Bohrwendeplatten Übersichtstabelle - Sorten

Workpiece material	ISO	Coating · Beschichtung		Cermet	Cemented Carbide	PCBN & PCD PCBN &PKD
		CVD	PVD			
P Steel · Stahl	P01					
	P10	YBD252	YBG202, YBG205			
	P20					
	P30					
	P40					
M Stainless Steel Rostfreier Stahl	M01					
	M10		YBG202, YBG205			
	M20					
	M30					
	M40					
K Cast iron · Grauguss	K01					
	K10	YBD252	YBG202, YBG205			
	K20					
	K30					
	K40					
N Hardened material Gehärtete Werkstoffe	N01					
	N10					
	N20				YD201	
	N30					
S Heat-resistant steel Warmfester Stahl	S01					
	S10		YBG202, YBG205			
	S20					
	S30					
H Non-ferrite materials Ne Metalle	H01					
	H10					
	H20					
	H30					

Features of drill · Merkmale der WSP-Bohrer

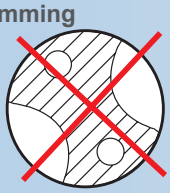
- Perfect insert assembling angle makes balanced cutting force, low vibration in machining process, thus achieve excellent surface quality.
- Advanced flute design possesses large chip pocket for chip removal.
- Complete diameter range, from 16 mm to 58 mm.

- Perfekte WSP Positionierung für ausgewogene Schnittkraftverteilung. Zur Erzielung guter Oberflächen.
- Fortschrittlicher großer Spanraum für eine gute Spanabfuhr.
- kompletter Durchmesserbereich von 16 mm-58mm



Small chip pocket
Easy to generate chips jamming

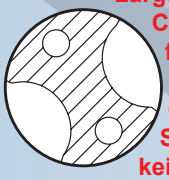
kleiner Spanraum, Spanstau.



Competitor
Wettbewerber

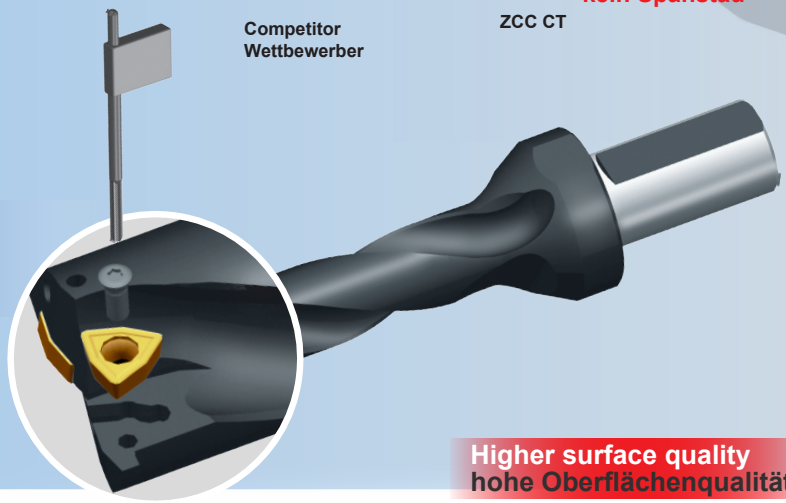
Large chip pocket
Chip jamming free

Großer Spanraum kein Spanstau

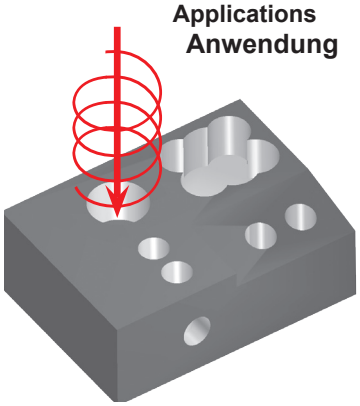


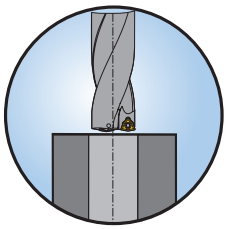
ZCC CT

Insert assembling
WSP Wechsel

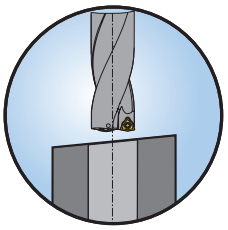


Applications
Anwendung

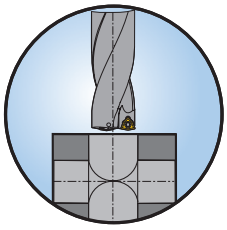




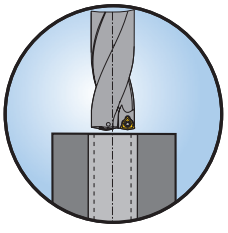
1. Common drilling
Normalbohren



2. Slant face drilling
Schrägbohren

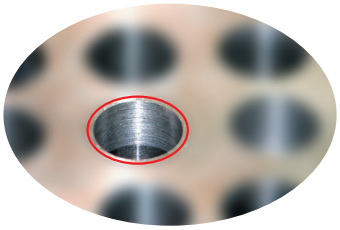


3. Cross-hole drilling
Bohren bei Querbohrungen



4. Counterboring
Aufbohren

Higher surface quality
hohe Oberflächenqualität



Better chip breaking performance
Gute Spankontrolle

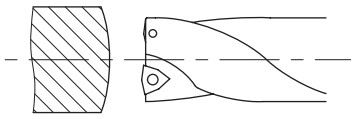
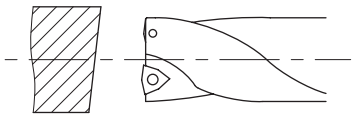
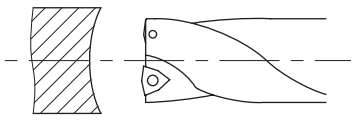
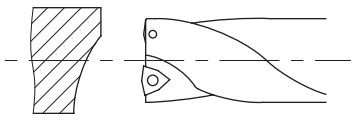
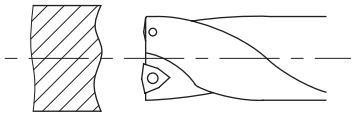


Technical information for shallo drills · Technische Informationen über WSP-Bohrer

■ initial drill penetration · Das Anbohren

Initial drill penetration is an important factor for successful drilling. One way of ensuring good hole quality is to make sure the penetration surface of the workpiece is vertical to the drill centre axis. In addition, an indexable drill can carry out initial penetration of convex, concave, inclined and irregular surfaces when accompanied with an adjustment of feed rates.

Das Anbohren ist ein wichtiger bzw. entscheidener Faktor für das erfolgreiche Bohren. Eine gute Bohrungsqualität und Standzeit erzielt man bei einer ebenen Anbohrfläche vertikal zur Bohrerachse. Beim Anbohren in konkaven, konvexen und unebenen Flächen soll der Vorschub entsprechend reduziert werden.

Workpiece surface Werkstück Oberflächen	Countermeasures Maßnahmen
	For a convex surface, the conditions are relatively good and the centre of the drill ideally makes contact with the workpiece first, thus can adopt normal feed. Bei konvexen Anbohrflächen ist die Bearbeitungsituation realtiv gut. Der erste Kontakt des Bohrers geschieht über die Zentrumsschneide, so daß normale Vorschübe gewählt werden können.
	When penetrating an inclined surface, the cutting edges will be unevenly loaded which may result in the premature drill wear. If the angle of the inclined surface is larger than two degrees, the feed should be reduced to 1/3 of that recommended for the drill. Bei Schrägflächen wird der Bohrer aus dem Zentrum gedrückt. Dadurch wird der Bohrerverschleiß erhöht. Bei einem Winkel von über 2° sollte der Vorschub auf 1/3 der empfohlenen Werte reduziert werden.
	When drilling into concave surface, drill center axis normally tends to off-center, the feed should be reduced to 1/3 of that recommended for the drill. Beim Anbohren in konkaven Flächen kann der Bohrer aus dem Zentrum gedrückt werden. Vorschub auf 1/3 reduzieren.
	When drilling into non-symmetric curved surfaces, the drill tends to deviate from the centre because of penetrating against an inclined surface. The feed should be reduced to lower than that recommended for the initial penetration of concave surfaces. Beim Bohren in asymetrischen Flächen sollte der Vorschub entsprechend reduziert werden. Eventuell unter den Werten die konkaven Flächen.
	When drilling into irregular surface, there is a risk of the inserts chipping and this may also occur when drilling through the workpiece. Therefore the feed rate should be reduced. Beim Bohren in stark asymetrischen Flächen können beim Anbohren und beim Austritt des Bohrens aus dem Werkstück Ausbrüche an der Wendeschneidplatte entstehen. Auch hier den Vorschub entsprechend reduzieren.

Calculations for shallow drilling · Berechnungsbeispiele für WSP-Bohrer

• Cutting speed · Schnittgeschwindigkeit (Vc)

$$Vc = \frac{Dc \times \pi \times n}{1000}$$

Vc (m/min): cutting speed · Schnittgeschwindigkeit
Dc (mm): drill diameter · Bohrerdurchm. Ø
n (rev/min): rotating speed · Umdrehungen
π ~ 3,14

○ Example · Beispiel

Spindle speed is1600 rev/min, drill diameter is 20mm, thus cutting speed is:
Spindelumdrehung beträgt 1600 u/min, Bohrerdurchmesser ist 20mm, dadurch ist die Schnittgeschw.:

$$Vc = \frac{Dc \times \pi \times n}{1000} = \frac{20 \times 3.14 \times 1600}{1000} = 100\ (m/min)$$

• Feed speed · Vorschub

$$Vf = fr \times n\ (mm/min)$$

Vf (mm/min): feed speed · Schnittgeschwindigkeit
fr (mm/rev): feed rate per revolution · Vorschub pro Umdreh.
n (rev/min): spindle speed · Umdrehungen

○ Example · Beispiel

Spindle speed is1500 rev/min, feed rate per revolution is 0.1mm/rev, thus feed speed is:
Spindelumdrehung beträgt 1500 u/min, Vorschub pro Umdrehung= 0,1mm/rev:

$$Vf = fr \times n = 0.1 \times 1500 = 150\ (mm/min)$$

• Machining time · Bearbeitungszeit

$$Tc = \frac{Id \times i}{n \times f}$$

Tc (min): machining time · Bearbeitungszeit
fr (mm/rev): feed rate per revolution · Vorschub pro Umdreh.
i: number of holes · i: Anzahl der Bohrung.
Id (mm): drilling depth · Bohrtiefe
n (rev/min): spindle speed · Drehzahl

○ Example · Beispiel

Calculate the drilling time, with following formular:

drill diameter 20mm, depth 40mm
cutting speed 100m/min
feed rate 0,1/rev

$$n = \frac{Vc \times 1000}{Dc \times \pi} = \frac{100 \times 1000}{20 \times 3.14} = 1600\ (rev/min)$$

Berechnen Sie die Bohrzeit, mit folgender Formel:

Bohrdurchm. 20mm, Bohrtiefe 40mm
Schnittgeschwindigk. 100m/min
Vorschub pro Umdrehung 0,1re

$$Tc = \frac{Id \times i}{n \times fr} = \frac{40 \times 1}{1600 \times 0.1} = 0.25\ (min)$$

• Metal removal rate · Zerspanungsvolumen

$$Q = \frac{Vf \times \pi \times Dc^2}{4 \times 1000}$$

Q (cm3/min): metal removal rate · Q (cm3/min): Zerspanungsvolumen
Dc(mm): drill diameter · Dc(mm): Bohrerdurchmesser
Vf (mm/min): feed speed · Vorschub
π ~ 3,14

○ Example · Beispiel

Drill diameter is 20mm, feed speed is 160mm/min, thus metal removal rate is:
Bohrdurchmesser20mm, Vorschub ist 160mm/min, dadurch liegt das Zerspanungsvolumen bei:

$$Q = \frac{Vf \times \pi \times Dc^2}{4 \times 1000} = \frac{160 \times 3.14 \times 20^2}{4 \times 1000} = 50.24\ (cm^3/min)$$

Recommended cutting data for shallow drills · Empfohlene Schnittdaten für WSP-Bohrern

ISO	Material	Hardness HB Härte HB	Diameter Dc Durchmesser mm Ø	Feed rate Vorschub fn [mm/r]	Cutting speed Schnittgeschwindigk.Vc [m/min]
P	Carbon steel Kohlenstoff-stahl	80-200	16.0-23.0 24.0-30.0 31.0-38.0 39.0-46.0 47.0-58.0	0.05-0.09 0.05-0.09 0.06-0.10 0.07-0.11 0.08-0.12	200(170-240)
	Low alloy steel Niedrigleg. Stahl	150-260	16.0-23.0 24.0-30.0 31.0-38.0 39.0-46.0 47.0-58.0	0.05-0.09 0.05-0.12 0.06-0.14 0.08-0.16 0.10-0.20	170(140-220)
	High alloy steel Hochleg. Stahl	150-320	16.0-23.0 24.0-30.0 31.0-38.0 39.0-46.0 47.0-58.0	0.05-0.09 0.05-0.12 0.06-0.16 0.08-0.18 0.10-0.22	150(120-180)
	Cast steel Gussstahl	180-250	16.0-23.0 24.0-30.0 31.0-38.0 39.0-46.0 47.0-58.0	0.05-0.08 0.05-0.08 0.06-0.10 0.07-0.11 0.07-0.12	140(120-170)
M	Stainless steel Ferrite Martensite Rostfreier Stahl	150-270	16.0-23.0 24.0-30.0 31.0-38.0 39.0-46.0 47.0-58.0	0.05-0.09 0.05-0.12 0.06-0.16 0.08-0.18 0.10-0.22	160(110-230)
	Austenite	150-275	16.0-23.0 24.0-30.0 31.0-38.0 39.0-46.0 47.0-58.0	0.05-0.09 0.05-0.11 0.06-0.13 0.08-0.14 0.10-0.16	140(110-220)
K	Malleable cast iron Temperguss	150-230	16.0-23.0 24.0-30.0 31.0-38.0 39.0-46.0 47.0-58.0	0.05-0.10 0.05-0.14 0.08-0.16 0.10-0.20 0.12-0.24	160(120-220)
	Gray cast iron Grauguss	150-220	16.0-23.0 24.0-30.0 31.0-38.0 39.0-46.0 47.0-58.0	0.05-0.10 0.05-0.14 0.08-0.16 0.10-0.20 0.12-0.24	200(170-240)
	Nodular cast iron GGG	160-250	16.0-23.0 24.0-30.0 31.0-38.0 39.0-46.0 47.0-58.0	0.05-0.09 0.05-0.12 0.06-0.14 0.08-0.16 0.10-0.20	160(130-200)
N	Al alloy Alu-Leg.	60-110	16.0-23.0 24.0-30.0 31.0-38.0 39.0-46.0 47.0-58.0	0.05-0.10 0.05-0.14 0.08-0.16 0.10-0.20 0.12-0.24	300(250-350)

Reaming · Reiben

Reamers · Reibahlen

Solid carbide reamers overview	**C107**	**VHM Reibahlen Übersicht**
Graphics identification	**C107**	Graphische Werkzeugbeschreibung
Code Key	**C108**	ISO Kennzeichnung
Solid carbide reamer program	**C109-C111**	**VHM Reibahlen Programm**
Recommended cutting datas	**C112**	Empfohlene Schnittdaten
Technical information	**C113-115**	**Technische Informationen**
Order form for non-standard products	**C116**	Bestellformular für Sonderwerkzeuge

Solid carbide reamers overview · VHM Reibahlen Übersicht

Name	Type · Typ	Shape Ausführung	Diameter range Ø	Workpiece material Werkstück Material							Page Seite	
				P	M	K	N		S	H		
				Carbon steel Alloy steel Kohlenst. Stahl Leg. Stahl	Stainless steel Rostfreier Stahl	Cast iron Gusseisen	Aluminum alloy Alu leg.	Copper alloy Kupfer leg.	Heat resist. alloy Warmfeste leg.	High hard. steel Gehärteter Stahl	Specification Spezifikation	Cutting datas Schnittdaten
Right helical flute rechts gedrallt	**3101H7**		Ø4-Ø20			✔	✔	✔			C109	C112
Straight flute gerade genutet	**3102H7**		Ø4-Ø20			✔	✔	✔			C110	C112
Left helical flute links gedrallt	**3103H7**		Ø4-Ø20			✔	✔	✔			C111	C112

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

Solid carbide reamers icons information · VHM Reibahlen Grafische Beschreib.

Precision class of reamed hole
Bohrungstoleranzklasse

H7

The precision class of reamed hole reaches H7 specified in GB/T1800-1804

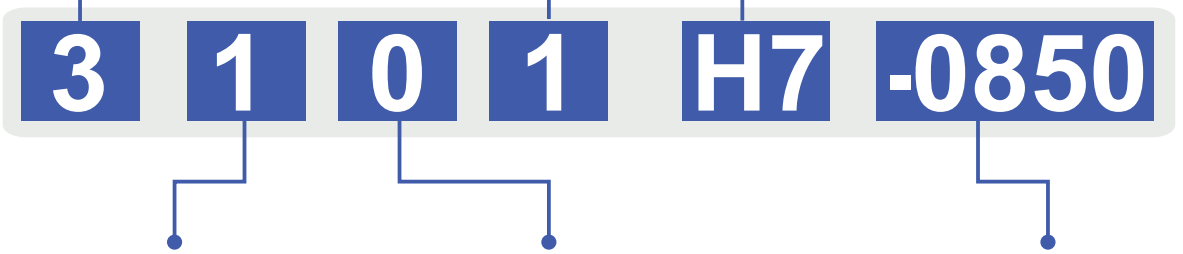
Toleranzklasse H7 angegeben in GB/T1800-1804

Shank · Schaft



Straight shank
Zylinderschaft

Solid carbide reamer Code Key · VHM Reibahlen ISO Kennzeichnung



Tool Type · Werkzeugtyp	
Code	Description / *Beschreibung*
3	Reamer Reibahle

Chip flute · Spannut	
Code	Description · Beschreibung
1	Right chip flute Spannut Rechtsdrall
2	Straight flute Spannut gerade genutet
3	Left chip flute Spannut Linksdrall

Precision class of reamed hole Toleranzklasse	
Code	Description · Beschreibung
H7	The precision class of reamed hole reaches H7 specified in GB/T1800-1804 Die Toleranzklasse der geriebenen Bohrung entspricht H7

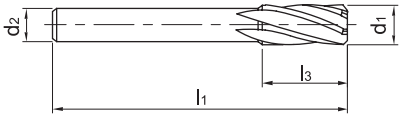
Shank type Schaftausführung	
Code	Description · Beschreibung
1	Parallel shank Zylinderschaft
2	Square Straight shank Zylinderschaft DIN10 Zylinderschaft DIN10
5	Straight shank Zylinderschaft as per DIN 6535HA Zylinderschaft DIN6535HA
9	Taper shank MK-Schaft

Mode of cooling Kühlung	
Code	Description · Beschreibung
0	External Außenkühlung
1	Internal Innenkühlung

Diameter Durchmesser	
Code	Description · Beschreibung
0850	Diameter is 8.5mm Durchmesser is 8.5mm

3101H7 with Straight shank and rigth helical flute · mit Zylindersch. und rechtsgedrallte Spannute





H7

Type · Typ	Basic dimension(mm) · Basis Abmessungen				Number of teeth Zähnezahl	Grade · Sorte
	d_1	$d_{2(h7)}$	l_1	l_3		YK10F
3101H7-0400	4.0	3.55	56	20	4	○
3101H7-0450	4.5	4.00	63	22	6	○
3101H7-0500	5.0	4.00	63	22	6	○
3101H7-0550	5.5	5.00	63	22	6	○
3101H7-0600	6.0	5.00	63	22	6	○
3101H7-0650	6.5	5.00	63	22	6	○
3101H7-0700	7.0	6.30	71	25	6	○
3101H7-0750	7.5	6.30	71	25	6	○
3101H7-0800	8.0	6.30	71	25	6	○
3101H7-0850	8.5	8.00	71	25	6	○
3101H7-0900	9.0	8.00	71	25	6	○
3101H7-0950	9.5	8.00	71	25	6	○
3101H7-1000	10.0	8.00	71	25	6	○
3101H7-1050	10.5	8.00	71	25	6	○
3101H7-1100	11.0	10.00	80	28	6	○
3101H7-1150	11.5	10.00	80	28	6	○
3101H7-1200	12.0	10.00	80	28	6	○
3101H7-1250	12.5	10.00	80	28	6	○
3101H7-1300	13.0	10.00	80	28	6	○
3101H7-1350	13.5	12.5	90	32	6	○
3101H7-1400	14.0	12.5	90	32	6	○
3101H7-1450	14.5	12.5	90	32	6	○
3101H7-1500	15.0	12.5	90	32	6	○
3101H7-1550	15.5	12.5	90	32	6	○
3101H7-1600	16.0	12.5	90	32	6	○
3101H7-1700	17.0	12.5	90	32	6	○
3101H7-1800	18.0	16.00	100	36	6	○
3101H7-1900	19.0	16.00	100	36	6	○
3101H7-2000	20.0	16.00	100	36	6	○

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

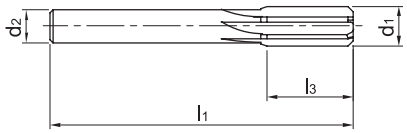
Grade	Workpiece material · Werkstückstoff										
	Mild steel Baustahl HB≤180	Carbon steel, Alloy steel	Hardened steel · gehärteter Stahl ~40HRC	~50HRC	~60HRC	Stainless steel Rostfreier Stahl	Cast iron Gusseisen	Nodular cast iron GGG	Aluminum alloy Alu-leg.	Copper alloy Kupfer leg.	Heat resist. alloy warmfest. leg.
YK10F							✔	✔	✔	✔	

● Ex Stock / ab Lager ○ On demand / auf Anfrage

Code key C108
ISO Kennzeichen
Cutting data C112
Schnittdaten
Technical Information C113-115
Technische Information.
Non-standart tailor made C 116
Bestellformular für Sonderwerkzeuge

3102H7 with Straight shank and flute · mit Zylinderschaft und rechtsgedrallte Spannute





H7

Type · Typ	Basic dimension(mm) · Basis Abmessungen				Number of teeth Zähnezahl	Grade · Sorte
	d_1	$d_2(h_7)$	l_1	l_3		YK10F
3102H7-0400	4.0	3.55	56	20	4	○
3102H7-0450	4.5	4.00	63	22	6	○
3102H7-0500	5.0	4.00	63	22	6	○
3102H7-0550	5.5	5.00	63	22	6	○
3102H7-0600	6.0	5.00	63	22	6	○
3102H7-0650	6.5	5.00	63	22	6	○
3102H7-0700	7.0	6.30	71	25	6	○
3102H7-0750	7.5	6.30	71	25	6	○
3102H7-0800	8.0	6.30	71	25	6	○
3102H7-0850	8.5	8.00	71	25	6	○
3102H7-0900	9.0	8.00	71	25	6	○
3102H7-0950	9.5	8.00	71	25	6	○
3102H7-1000	10.0	8.00	71	25	6	○
3102H7-1050	10.5	8.00	71	25	6	○
3102H7-1100	11.0	10.00	80	28	6	○
3102H7-1150	11.5	10.00	80	28	6	○
3102H7-1200	12.0	10.00	80	28	6	○
3102H7-1250	12.5	10.00	80	28	6	○
3102H7-1300	13.0	10.00	80	28	6	○
3102H7-1350	13.5	12.5	90	32	6	○
3102H7-1400	14.0	12.5	90	32	6	○
3102H7-1450	14.5	12.5	90	32	6	○
3102H7-1500	15.0	12.5	90	32	6	○
3102H7-1550	15.5	12.5	90	32	6	○
3102H7-1600	16.0	12.5	90	32	6	○
3102H7-1700	17.0	12.5	90	32	6	○
3102H7-1800	18.0	16.00	100	36	6	○
3102H7-1900	19.0	16.00	100	36	6	○
3102H7-2000	20.0	16.00	100	36	6	○

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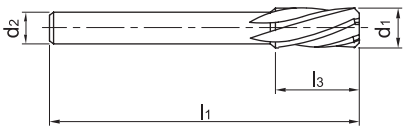
Grade	Workpiece material · Werkstückstoff										
	Mild steel Baustahl HB≤180	Carbon steel, Alloy steel	Hardened steel · gehärteter Stahl ~40HRC	~50HRC	~60HRC	Stainless steel Rostfreier Stahl	Cast iron Gusseisen	Nodular cast iron GGG	Aluminum alloy Alu-leg.	Copper alloy Kupfer leg.	Heat resist. alloy warmfest. leg.
YK10F							✔	✔	✔	✔	

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Code key C108
ISO Kennzeichen
Cutting data C112
Schnittdaten
Technical Information C113-115
Technische Information.
Non-standart tailor made C 116
Bestellformular für Sonderwerkzeuge

3103H7 with Straight shank and left helical flute · mit Zylinderschaft und linksgedrallte Spannute





H7

Type · Typ	Basic dimension(mm) · Basis Abmessungen				Number of teeth Zähnezahl	Grade · Sorte
	d_1	$d_{2(h7)}$	l_1	l_3		YK10F
3103H7-0400	4.0	3.55	56	20	4	○
3103H7-0450	4.5	4.00	63	22	6	○
3103H7-0500	5.0	4.00	63	22	6	○
3103H7-0550	5.5	5.00	63	22	6	○
3103H7-0600	6.0	5.00	63	22	6	○
3103H7-0650	6.5	5.00	63	22	6	○
3103H7-0700	7.0	6.30	71	25	6	○
3103H7-0750	7.5	6.30	71	25	6	○
3103H7-0800	8.0	6.30	71	25	6	○
3103H7-0850	8.5	8.00	71	25	6	○
3103H7-0900	9.0	8.00	71	25	6	○
3103H7-0950	9.5	8.00	71	25	6	○
3103H7-1000	10.0	8.00	71	25	6	○
3103H7-1050	10.5	8.00	71	25	6	○
3103H7-1100	11.0	10.00	80	28	6	○
3103H7-1150	11.5	10.00	80	28	6	○
3103H7-1200	12.0	10.00	80	28	6	○
3103H7-1250	12.5	10.00	80	28	6	○
3103H7-1300	13.0	10.00	80	28	6	○
3103H7-1350	13.5	12.5	90	32	6	○
3103H7-1400	14.0	12.5	90	32	6	○
3103H7-1450	14.5	12.5	90	32	6	○
3103H7-1500	15.0	12.5	90	32	6	○
3103H7-1550	15.5	12.5	90	32	6	○
3103H7-1600	16.0	12.5	90	32	6	○
3103H7-1700	17.0	12.5	90	32	6	○
3103H7-1800	18.0	16.00	100	36	6	○
3103H7-1900	19.0	16.00	100	36	6	○
3103H7-2000	20.0	16.00	100	36	6	○

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Grade	Workpiece material · Werkstückstoff										
	Mild steel Baustahl HB≤180	Carbon steel, Alloy steel	Hardened steel · gehärteter Stahl ~40HRC	~50HRC	~60HRC	Stainless steel Rostfreier Stahl	Cast iron	Nodular cast iron GGG	Aluminum alloy Alu-leg.	Copper alloy Kupfer leg.	Heat resist. alloy warmfest. leg.
YK10F							✔	✔	✔	✔	

Code key C108 ISO Kennzeichen
Cutting data C112 Schnittdaten
Technical Information C113-115 Technische Information.
Non-standart tailor made C 116 Bestellformular für Sonderwerkzeuge

3101H7 / 3102H7 / 3103H7

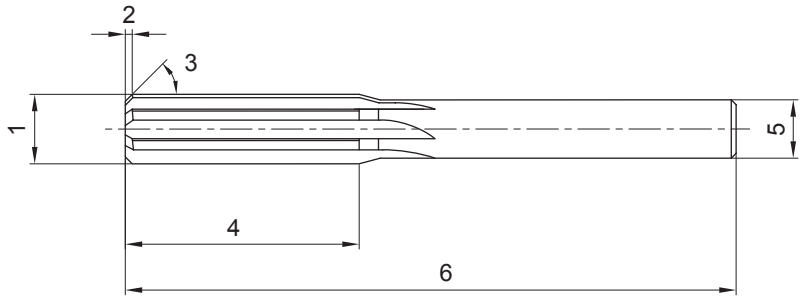
Workpiece material Werkstück-stoff	Cast iron Nodular cast iron Gusseisen · GGG			Copper alloy Kupfer leg.			Aluminium alloy Alu leg.		
Cutting speed Schnittgesch.	8~16m/min			10~25m/min			15~30 m/min		
Diameter Ø (mm)	Rotating speed Umdrehung (min^{-1})	Feed Speed Vorschub (mm/r)	Toleranz Allowance (mm)	Rotating speed Umdrehung (min^{-1})	Feed Speed Vorschub (mm/r)	Toleranz Allowance (mm)	Rotating speed Umdrehung (min^{-1})	Feed Speed Vorschub (mm/r)	Toleranz Allowance (mm)
4	950	0.04~0.06	0.1~0.2	1600	0.04~0.06	0.1~0.2	2000	0.04~0.06	0.1~0.2
5	760	0.05~0.09	0.1~0.2	1300	0.05~0.09	0.1~0.2	1600	0.05~0.09	0.1~0.2
6	640	0.06~0.12	0.1~0.2	1050	0.06~0.12	0.1~0.2	1300	0.06~0.12	0.1~0.2
7	550	0.07~0.14	0.1~0.2	910	0.07~0.14	0.1~0.2	1150	0.07~0.14	0.1~0.2
8	480	0.08~0.16	0.1~0.2	800	0.08~0.16	0.1~0.2	1000	0.08~0.16	0.1~0.2
9	430	0.09~0.18	0.1~0.2	710	0.09~0.18	0.1~0.2	890	0.09~0.18	0.1~0.2
10	380	0.10~0.20	0.1~0.2	640	0.10~0.20	0.1~0.2	800	0.10~0.20	0.1~0.2
11	350	0.11~0.22	0.1~0.2	580	0.11~0.22	0.1~0.2	720	0.11~0.22	0.1~0.2
12	320	0.12~0.24	0.1~0.2	530	0.12~0.24	0.1~0.2	660	0.12~0.24	0.1~0.2
13	290	0.13~0.26	0.1~0.2	490	0.13~0.26	0.1~0.2	610	0.13~0.26	0.1~0.2
14	270	0.14~0.28	0.1~0.2	460	0.14~0.28	0.1~0.2	570	0.14~0.28	0.1~0.2
15	250	0.15~0.30	0.1~0.2	430	0.15~0.30	0.1~0.2	530	0.15~0.30	0.1~0.2
16	240	0.16~0.32	0.1~0.2	400	0.16~0.32	0.1~0.2	500	0.16~0.32	0.1~0.2
17	225	0.18~0.34	0.1~0.2	380	0.18~0.34	0.1~0.2	470	0.18~0.34	0.1~0.2
18	210	0.20~0.36	0.1~0.2	350	0.20~0.36	0.1~0.2	440	0.20~0.36	0.1~0.2
19	200	0.22~0.38	0.1~0.2	340	0.22~0.38	0.1~0.2	420	0.22~0.38	0.1~0.2
20	190	0.24~0.40	0.1~0.2	320	0.24~0.40	0.1~0.2	400	0.24~0.40	0.1~0.2

1.Please select the holder with high rigidity and precision.
2.Make sure supply sufficient coolant.
3.Please adjust cutting parameters according to workpiece and machine rigidity.

1. Bitte wählen Sie einen Halter mit hoher Stabilität und Genauigkeit.
2. Stellen Sie sicher, dass ausreichend Kühlmittel bereit gestellt wird.
3. Bitte stimmen Sie die Schnittdaten mit dem Werkstück und der Stabilität der Maschine ab.

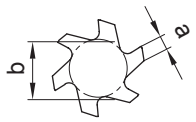
Terminology of reamer · Terminology von Reibahlen

● Version · Ausführung



1. Cutting diameter
2. Cutting chamfer length
3. Approach angle
4. Cutting edge length
5. Shank diameter
6. Overall length

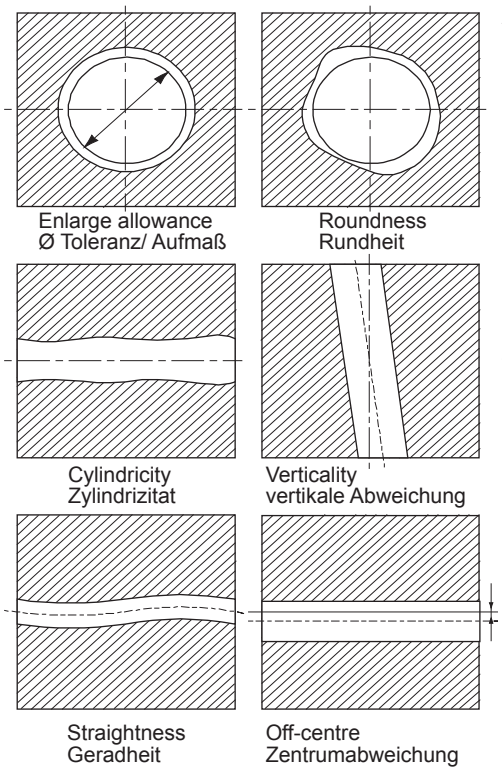
1. Schneidendurchmesser
2. Schneidenfasenlänge
3. Einstellwinkel
4. Schneidenlänge
5. Schaftdurchmesser
6. Gesamtlänge



a. Margin width
b. Core diameter

a. Schneidenstärke
b. Kerndurchmesser

Reaming is the semi-finishing and finishing of an existing hole to achieve precise size, high surface quality, perfect roundness and cylindricity etc.
In order to achieve precise hole in reaming process, it must to determine the reamer diameter correctly. Therefore, it is need to consider allowance determined by workpiece material and machining conditions. In addition, it is also need to select the cutting conditions correctly except using high precision reamer to achieve good surface quality.
The reaming precision is mainly decided by diameter and radial run-out. With respect to cutting condition, it is better to select low speed cutting considering to improve machining precision, but it also must take upper limit of machining efficiency into consideration.



Als Reiben bezeichnet man die Vor- oder Fertigbearbeitung einer vorhandenen Bohrung innerhalb einer engen Toleranz, mit hoher Oberflächenqualität, perfekte Rundheit, Zylindrizität etc.
Um eine exakte Bohrung durch Reiben zu erzielen kommt es, auf die Auswahl der Reibahle und des Reibahlendurchmessers an.
Zusätzlich sind die Bohrungstoleranzen, die Werkstückstoffe und die Maschinenbedingungen zu berücksichtigen.
Die Bohrungsqualität wird darüber hinaus stark von dem Rundlauf des Werkzeuges beeinflusst. Die Schnittdaten sollten zur Erzielung einer präzisen Bohrung eher etwas niedriger gewählt werden, ohne allerdings die Wirtschaftlichkeit unberücksichtigt zu lassen.

Common problems Fehler	Solutions	Lösungen
Oversize holes Bohrung zu groß	1. Reduce diameter of reamer. 2.The center of reamer is not in alignment with hole center, adjust the concentricity of hole and reamer. 3. Large radial run-out of reamer, good radial run-out is a Key Keil to successful reaming 4. Scratches on reamer shank. 5. Select a suitable coolant. 6. Adjust cutting parameters.	1. Reibahlendurchmesser reduzieren. 2. Zentrizität von Reibahle und Bohrung prüfen. 3. Rundlaufgenauigkeit der Reibahle prüfen. 4. Reibahlenschaft auf Kratzer oder Verletzungen prüfen. 5. Richtige Kühlmittel verwenden. 6. Schnittdaten anpassen.
Smaller holes Bohrung zu klein	1.Increase diameter of reamer. 2.Reduce rotating speed. 3.Reduce the margin width. 4.Excessive tool wear, please conduct cutting after regrinding. 5.Thermal expansion coefficient of workpiece is too large, please keep it cooled enough.	1. Reibahlendurchmesser erhöhen. 2. Schnittgeschwindigkeit reduzieren. 3. Aufmaß reduzieren. 4. zu goßer Werkzeugverschleiß. (Reibahle nachschleifen oder neu) 5. Der thermische Ausdehnungskoeffizient des Werkstückstoffes ist zu groß. Für ausreichende Kühlung sorgen.
Poor hole roundness & straightness Bohrung unrund & verlaufen	1.Ensure better roundness of reamer chamfer. 2.Low rigidity make the overhang as short as possible if no inference. 3.Check radial run-out after clamping reamer. 4.Adjust the concentricity of hole and reamer. 5.Ensure reaming allowance equality.	1. Rundlaufgenauigkeit der Reibahlenfase sicherstellen. 2. Geringe Stabilität; Überhang reduzieren. 3. Rundlaufgenauigkeit der Reibahle im geklemmten Zustand prüfen. 4. Konzentrizität zwischen Reibahle und Bohrung justieren. 5. Bohrergeometrie prüfen und sicherstellen.
Poor hole surface quality schlechte Oberflächenqualität	1. The hole surface roughness of entering part is bad. 2. Reduce rotating speed. 3. Ensure correct reaming allowance, too large or too small both will result bad surface roughness. 4. Select the reamer with large chip pocket, avoid chip jamming. 5. Increase clearance angle of reamer entering part . 6.Check whether there are built-up on chamfer and margin land. 7. Increase the rigidity of machine, holder and reamer . 8. Ensure whether the Type of reamer head is suitable for the workpiece. 9. Increase the margin width and land width appropriately.	1. Die Oberflächenqualität im Anschnittbereich prüfen und gegenfalls verbessern. 2. Schnittgeschwindigkeit reduzieren. 3. Richtiges Reibaufmaß versichern. Zu gering oder zu groß bringt schlechte Oberflächen. 4. Reibahlen mit ausreichend großem Spanraum verwenden. 5. Freiwinkel im Anschnitt der Reibahle vergrößern. 6. Anschnittfase der Reibahle auf Verschleiß oder Aufbauschneide prüfen. 7. Stabilität, der Maschine, Aufnahme und Reibahle gewährleisten. 8. Richtige Auswahl der Reibahle für den entsprechenden Einsatz prüfen. 9. Bohrungsaufmaß prüfen.
Hole precision is worse Geringe Bohrungsqualität	1. In return pass, the reamer should be pulled out of hole when rotating as the same direction before. Opposite rotation must be prohibited. 2. Reduce rotating speed. 3. Select the reamer with more lips. 4. Increase the margin width appropriately, enhance its guiding performance and extrusion effect. 5. Improve reamer lubricating property by surface treatment. 6. Select a suitable coolant.	1. Reibahle in Schnittrichtung zurück ziehen. 2. Schnittgeschwindigkeit reduzieren 3. Reibahlen mit mehr schneiden einsetzen. 4. Schneidenausführung und Rundlauffase Bohrerführung verbessern. Auf Zentrizität und Rundlauf prüfen. 5. Kühlmittelzuführung verbessern. 6. Auswahl des optimalen richtigen Kühlmittelschmierstoffes.

Common problems Fehler	Solutions	Lösungen
Reamer breakage, thermal damage Reibahlenbruch und termische Verformung	1.The guiding hole is defective before reaming, such as linearity in not good. 2.Adjust machining allowance to avoid tool breakage caused by too large allowance. 3.If the chip removal is not fluent, select a reamer with larger chip pocket. 4.Ensure supply insufficient coolant. 5.Adjust rotating speed and feed speed appropriately. 6.Increase the rigidity of machine, holder and reamer . 7.Improve the sharpness of reamer, make cutting light and fast. 8.Excessive wear on cutting edge, reach or surpass tool life, recommend to change tool or regrind.	1. Die Führungsbohrung ist qualitativ unzureichend. Bohrer und Bohrungsachse prüfen. 2. Bearbeitungsaufmaß nicht zu groß wählen. 3. Reibahlen mit ausreichend großen Spanraum wählen. 4. Ausreichende Kühlmittelmenge sicherstellen. 5. Richtige Schnittgeschwindigkeit und Vorschübe einstellen. 6. Stabilität der Maschine, Aufnahme und Werkzeug verbessern. 7. Schneidenschärfe der Reibahle verbessern. 8. Bei zu hohem Schneidenverschleiß, das Werkzeug wechseln oder Nachschleifen.
Damage on reamer shank Reibahlenschaft Beschädigung	1.Check whether the shank hardness is enough, too low hardness will cause deformation, too high hardness may cause breakage. 2.Check the conjunction of holder and bush, don't use the defective holder.	1. Die vorgegebene Härte des Schaftes prüfen. 2. Spannhülse und Halter auf Beschädigung prüfen.
short tool life Kurze Standzeit	1.Enhance reamer's cutting edge hardness. 2.Check the coolant. 3. Change the straight flute to helical flute. 4. Check all factors affecting machining precision.	1. Reibahlen mit verschleißfesteren Schneiden wählen. 2. Kühlmittelzufuhr prüfen. 3. Wechsel von gerade- zu spiralgenuteten Reibahlen. 4. Prüfen Sie die Faktoren, die die Bearbeitungspräzision beeinflussen.
Scratches on hole surface Zerkratzte Bohrungsoberfläche	1.Check no built-up on reamer surface. 2.Improve workpiece holding.	1. Schneide auf Aufbauschneidenbildung untersuchen und gegebenenfalls Schnittdaten korrigieren. 2. Werkstückspannung verbessern.
Trumpet-shaped entry hole Bohrungseintrittsbereich zu groß	1. Improve workpiece holding. 2. Check radial run-out after clamping reamer. 3. The center of reamer is not in alignment with hole center, adjust the concentricity of hole and reamer.	1. Werkstückspannung verbessern. 2. Rundlauf der Reibahle im geklemmten Zustand prüfen. 3. Das Zentrum des Werkzeuges stimmt nicht mit dem Zentrum der Bohrung überein. Zentrizität justieren.

Non-standard Taylor made · Sonderwerkzeuge

Name:

Firma/Company:

Fax:

Tel:

E-MAIL:

ZCC·CT
Heltorfer Straße 12
40472 Düsseldorf Germany
Fax: +49-(0)211-989240-111
E-Mail:info@zccct-europe.com

Machining information and Workpiece Material • Bearbeitungsinfo. und Werkstück Material

Machined hole
Bohrung

☐ Through-hole
Durchgangs-bohrung

☐ Blind-hole
Sackbohrung

Size of machined hole
Lochdurchmesser ____ mm

Tolerance of machined hole
Toleranz der Bohrung ____

Depth of machined hole
Bohrtiefe ____ mm

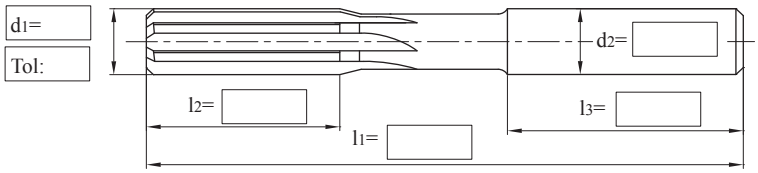
☐ Grey cast iron
Grauguss
☐ Nodular cast iron
GGG
☐ Aluminium alloy
Alu leg.
☐ Si Al alloy Si＜10%
Si Alu leg.
☐ Si Al alloy Si≥10%
Si Alu legierung

Machined material trademark
Spezieller Werkstoffstück: ____

Tensile strength · Zugfestigkeit: ____ N/mm²

Hardness · Härte: ____

Tool information • Werkzeug Information:

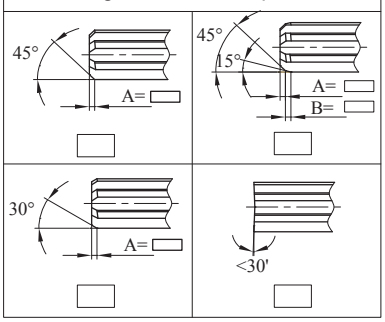


DIN6535

Shank • Schaft

☐ Form HA
☐ Form HB
☐ Form HE
☐ Straight shank/ Zylinders.
☐ Shank with tang DIN 1809
☐ Morse taper shank ☐
Special type

approach angle
Winkelangabe an der Hauptschneide



Cutter rotating direction · Drehrichtung	
Right rotating rechts gedreht	☐
Straight flute gerade genutet	☐
Left rotating links gedreht	☐

Cooling/ Kühlung	
☐	External Cooling
☐	Internal Cooling

Coating/ Beschichtung	
☐	Yes/ Ja
☐	No/ Nein

Remarks:
Bemerkungen:

Order quantity: piece
Auftragsmenge: Stück

Expected delivery date:
Lieferart:

Date · Datum:

confirmation · Unterschrift:

NOTIZEN:

Threading · Gewinde

Threading tools · Gewindewerkzeuge

Threading tools overview	**C119**	**Gewindewerkzeuge Übersicht**
Graphics identification	**C119**	**Graphische Werkzeugbeschreibung**
Threading tools Code Key	**C120**	**ISO Kennzeichnung**
Detail information	**C121-C128**	**Detaillierte Informationen**
Solid carbide threading tools	C121-C124	VHM Gewindebohrer
Solid carbide threading end mills	C125	VHM Gewindefräser
Recommended cutting datas	C126	Empfohlene Schnittdaten
Technical information	**C127**	**Technische Information**
Order form for non-standard products	C128	Bestellformular für Sonderwerkzeuge

Threading tool overview · VHM-Gewindebohrer, -fräser Übersicht

Name	Type · Typ	Shape Ausführung	Diameter range Ø	Workpiece material Werkstückstoff								Page · Seite	
				P		M	K	N		S	H		
				Carbon steel alloy steel	Kohlenst. Stahl Leg. Stahl	Stainless steel Rostfreier Stahl	Cast iron Gusseisen	Aluminum alloy Alu leg.	Copper alloy Kupfer leg,	Heat resist. alloy warmfeste leg.	High hard. steel gehärteter Stahl	Specification Spezifikation	Cutting datas Schnittdaten
Helical-flute tap spiral genutet	**4201C**		M4-M10				✔					C121	C126
Helical-flute tap spiral genutet	**4201A**		M4-M10					✔				C122	C126
Straight-flute tap gerade genutet	**4202C**		M4-M10				✔					C123	C126
Straight-flute tap gerade genutet	**4202A**		M4-M10					✔				C124	C126
Threading end mills Gewindefräser	**4111**		M5-M20	✔	✔		✔	✔				C125	C126

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

Graphics identification · Graphische Werkzeugbeschreibung

Shank · Schaft



Straight shank
Zylinderschaft



Square Straight shank as per DIN10
DIN 10 Schaft

Thread profile angle of tap
Winkel des Gewindeprofils



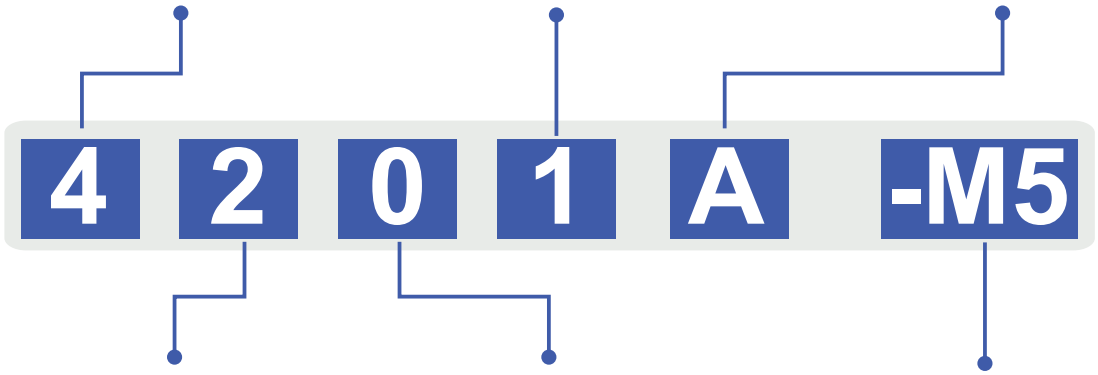
Indicate 60°

Precision class of screw thread
Prezisionsklasse des Gewindes



screw thread
Schraubengewinde

Threading taps and cutter Code Key · ISO Kennzeichnung Gewindefräser, -bohrer



Tool Type Werkzeugtyp

Code	Description · Beschreibung
4	Threading cutter Gewinde-Bearbeitungs-Werkzeug

Chip flute Spannut

Code	Description · Beschreibung
1	Right chip flute · Spannut Rechtsdrall
2	Straight flute · Spannut gerade
3	Left chip flute · Spannut Linksdrall

material Material

Code	Description · Beschreibung
A	Aluminum alloy Aluminum Legierung
C	Cast iron Grauguß

Shank Schaftausführung

Code	Description · Beschreibung
1	Straight shank / Zylinderschaft
2	Square Straight shank as per DIN10 Zylinderschaft DIN10
5	Straight shank as per DIN 6535HA Zylinderschaft DIN6535HA
9	Tapered shank Konischer Schaft

Typ of function Art der Bearbeitung

Code	Description · Beschreibung
0	Tap Gewindebohrer
1	Thread milling cutter Gewindefräser

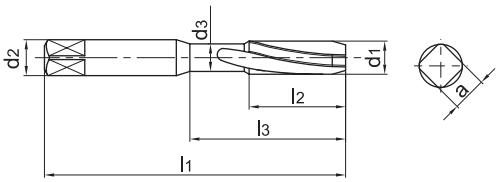
Specification Spezifikation

Code	Description · Beschreibung
M5	Nominal diameter of standard threading cutters is M5 der angegebene Durchmesser ist M 5

4201C

with right helical-flute taps with square head and straight shank
Gewindebohrer mit rechtsgedrallter Spannute und 4 Kant-Mitnahme und Zylinderschaft





60° ISO 2 (6H)

Type · Typ	Basic dimension(mm) · Basis Abmessungen									Number of teeth Zähne-anzahl	Grade · Sorte	
	d_1	P	d_2	d_3	l_1	l_2	l_3	a×a	Thread profile		KTG202	YK20F
4201C -M4	M4	0.7	4.5	3.1	63	13	21	3.4	60°	3	○	●
4201C –M5	M5	0.8	6.0	4.0	70	16	25	4.9	60°	3	○	●
4201C –M6	M6	1.0	6.0	4.7	80	19	30	4.9	60°	3	○	●
4201C –M8	M8	1.25	8.0	6.4	90	22	35	6.2	60°	3	○	●
4201C –M10	M10	1.5	10.0	8.1	100	24	39	8.0	60°	3	○	●

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

Grade	Workpiece material · Werkstückstoff										
	Mild steel Baustahl HB≤180	Carbon steel, Alloy steel	Hardened steel · gehärteter Stahl ~40HRC	~50HRC	~60HRC	Stainless steel Rostfreier Stahl	Cast iron Gusseisen	Nodular cast iron GGG	Aluminum alloy Alu leg.	Copper alloy Kupfer leg.	Heat resist. alloy warmfest. leg.
KTG202							✔	✔			
YK20F							✔	✔			

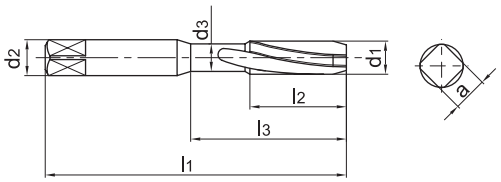
Code key C 120 ISO Kennzeichen
Cutting data C126 Schnittdaten
Technical Information C127 Technische Information.
Non-standart tailor made C 128 Bestellformular für Sonderwerkzeuge

● Ex Stock / ab Lager ○ On demand / auf Anfrage

4201A

with right helical-flute taps with square head and straight shank
Gewindebohrer mit rechtsgedrallter Spannute und 4 Kant-Mitnahme und Zylinderschaft





60° ISO 2 (6H)

Type · Typ	Basic dimension(mm) · Basis Abmessungen									Number of teeth Zähne-anzahl	Grade · Sorte
	d_1	P	d_2	d_3	l_1	l_2	l_3	a×a	Thread profile		YK20F
4201A -M4	M4	0.7	4.5	3.1	63	13	21	3.4	60°	3	●
4201A –M5	M5	0.8	6.0	4.0	70	16	25	4.9	60°	3	●
4201A –M6	M6	1.0	6.0	4.7	80	19	30	4.9	60°	3	●
4201A –M8	M8	1.25	8.0	6.4	90	22	35	6.2	60°	3	●
4201A –M10	M10	1.5	10.0	8.1	100	24	39	8.0	60°	3	●

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

Grade Sorte	Workpiece material · Werkstückstoff										
	Mild steel Baustahl HB≤180	Carbon steel, Alloy steel	Hardened steel · gehärteter Stahl ~40HRC	~50HRC	~60HRC	Stainless steel Rostfreier Stahl	Cast iron Gusseisen	Nodular cast iron GGG	Aluminum alloy Alu leg.	Copper alloy Kupfer leg.	Heat resist. alloy warmfest. leg.
YK20F									✔		

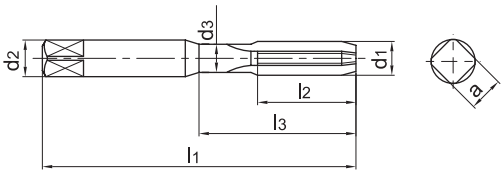
● Ex Stock / ab Lager ○ On demand / auf Anfrage

Code key C 120 ISO Kennzeichen
Cutting data C126 Schnittdaten
Technical Information C127 Technische Information.
Non-standart tailor made C 128 Bestellformular für Sonderwerkzeuge

4202C

with right straight-flute taps with square head and straight shank
Gewindebohrer mit gerader Spannute und 4 Kant-Mitnahme und Zylinderschaft





60° ISO 2 (6H)

Type · Typ	Basic dimension(mm) · Basis Abmessungen									Number of teeth Zähne-anzahl	Grade · Sorte	
	d_1	P	d_2	d_3	l_1	l_2	l_3	a×a	Thread profile		KTG202	YK20F
4202C -M4	M4	0.7	4.5	3.1	63	13	21	3.4	60°	3	○	●
4202C –M5	M5	0.8	6.0	4.0	70	16	25	4.9	60°	3	○	●
4202C –M6	M6	1.0	6.0	4.7	80	19	30	4.9	60°	3	○	●
4202C –M8	M8	1.25	8.0	6.4	90	22	35	6.2	60°	3	○	●
4202C –M10	M10	1.5	10.0	8.1	100	24	39	8.0	60°	3	○	●

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

Grade	Workpiece material · Werkstückstoff										
	Mild steel Baustahl HB≤180	Carbon steel, Alloy steel	Hardened steel · gehärteter Stahl ~40HRC	~50HRC	~60HRC	Stainless steel Rostfreier Stahl	Cast iron Gusseisen	Nodular cast iron GGG	Aluminum alloy Alu-leg.	Copper alloy Kupfer leg.	Heat resist. alloy warmfest. leg.
KTG202							✔	✔			
YK20F							✔	✔			

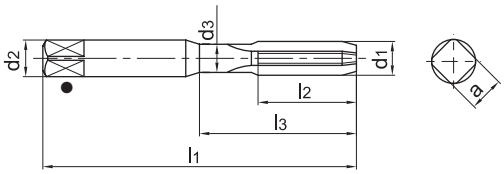
● Ex Stock / ab Lager ○ On demand / auf Anfrage

Code key C 120 ISO Kennzeichen
Cutting data C126 Schnittdaten
Technical Information C127 Technische Information.
Non-standart tailor made C 128 Bestellformular für Sonderwerkzeuge

4202A

Straight-flute taps with square head and Straight shank
Gewindebohrer mit gerader Spannute mit 4 Kant-Mitnahme und Zylinders.







Type · Typ	Basic dimension(mm) · Basis Abmessungen									Number of teeth Zähne-anzahl	Grade · Sorte
	d_1	P	d_2	d_3	l_1	l_2	l_3	a×a	Thread profile		YK20F
4202A -M4	M4	0.7	4.5	3.1	63	13	21	3.4	60°	3	●
4202A –M5	M5	0.8	6.0	4	70	16	25	4.9	60°	3	●
4202A –M6	M6	1.0	6.0	4.7	80	19	30	4.9	60°	3	●
4202A –M8	M8	1.25	8.0	6.4	90	22	35	6.2	60°	3	●
4202A –M10	M10	1.5	10.0	8.1	100	24	39	8.0	60°	3	●

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

Grade	Workpiece material · Werkstückstoff										
	Mild steel Baustahl HB≤180	Carbon steel, Alloy steel	Hardened steel · gehärteter Stahl			Stainless steel Rostfreier Stahl	Cast iron Gusseisen	Nodular cast iron GGG	Aluminum alloy Alu-leg.	Copper alloy Kupfer leg.	Heat resist. alloy warmfest. leg.
			~40HRC	~50HRC	~60HRC						
YK20F									✔		

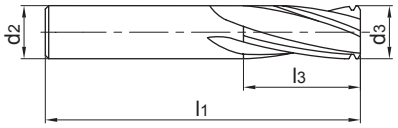
● Ex Stock / ab Lager ○ On demand / auf Anfrage

Code key C 120
ISO Kennzeichen
Cutting data C126
Schnittdaten
Technical Information C127
Technische Information.
Non-standart tailor made C 128
Bestellformular für Sonderwerkzeuge

4111

Thread milling cutter with straigth shank
Gewindefräser mit Zylinderschaft









Type · Typ	Basic dimension (mm) · Basis Abmessungen						Number of teeth Zähnezahl	Grade · Sorte	
	d_1	P	d_2	l_1	l_3	d_3		KTG303	YK30F
4111-M5	M5	0.8	6	42	8.0	3.6	3	○	○
4111-M6	M6	1.0	6	57	9.0	4.0	3	○	○
4111-M8	M8	1.25	6	57	12.5	5.0	3	○	○
4111-M10	M10	1.5	6	57	15.0	5.9	4	○	○
4111-M12	M12	1.75	8	63	19.25	7.9	4	○	○
4111-M16	M16	2.0	10	72	24.0	9.9	4	○	○
4111-M20	M20	2.5	12	83	30.0	11.9	4	○	○

Material Overview · Material Übersicht

✔ = Very suitable · Sehr empfohlen
✔ = Suitable · Empfohlen

Grade Sorte	Workpiece material · Werkstückstoff										
	Mild steel Baustahl HB≤180	Carbon steel, Alloy steel	Hardened steel · gehärteter Stahl ~40HRC	~50HRC	~60HRC	Stainless steel Rostfreier Stahl	Cast iron Gusseisen	Nodular cast iron GGG	Aluminum alloy Alu leg.	Copper alloy Kupfer leg.	Heat resist. alloy warmfest. leg.
KTG303	✔	✔	✔				✔	✔	✔		
YK30F							✔		✔		

● Ex Stock / ab Lager ○ On demand / auf Anfrage

Code key C 120
ISO Kennzeichen
Cutting data C126
Schnittdaten
Technical Information C127
Technische Information.
Non-standart tailor made C 128
Bestellformular für Sonderwerkzeuge

Tap · Gewindebohrer

Workpiece material Werkstückstoff	Cutting speed (m/min) · Schnittgeschwindigkeit		
	4201C 4202C		4201A 4202A
	YK20F	KTG202	YK20F
Cast iron Gusseisen	10~15	20~40	---
Nodular cast iron GGG	7~12	15~30	---
Aluminum alloy Alu-Leg.	---	---	10~25
Casting aluminium alloy≥Si10% gegossene Alu-Leg.	---	---	10~20
Casting aluminium alloy≥Si10% gegossene Alu-Leg.	---	---	10~15

1.Threading is a complex machining, suitable coolant must be used. Using oil coolant is recommended for the cutting conditions above.
2.The table above is a general selecting standard, change it according to various cutting conditions.
3.Please adjust the cutting parameter appropriately according to system rigidity.

1. Beim Gewindeschneiden muss unbedingt, Kühlmittel eingesetzt werden. Die obigen Schnittdaten basieren auf dem Einsatz von Öl.
2. In der obrigen Tabelle sind Standarddaten angegeben.
3. Die Schnittdaten sollten entsprechend der Bearbeitung und Stabilität angepaßt werden.

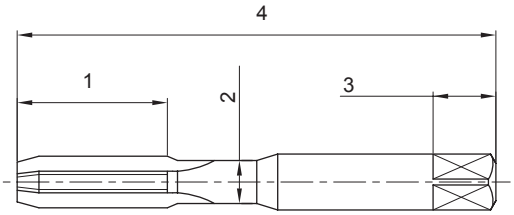
4111 Threading milling cutter · Gewindefräser

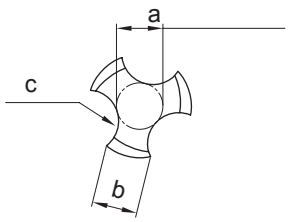
Workpiece material Werkstückstoff	carbon steel Kohlenstoffstahl ~750N/mm²		alloy steel leg. Stahl ~30HRC		Cast iron Nodular cast iron Grauguss, GGG		Aluminum alloy Alu-Leg.		casting aluminium alloy gegossene Alu-Leg.			
									≤Si 10%		≥Si 10%	
Cutting speed Schnittgeschw.	40~80m/min		20~40m/min		40~70m/min		40~80m/min		60~140m/min		60~130m/min	
Diameter Ø (mm)	Rotating speed Drehzahl (min-1)	Feed rate per tooth Vorschub pro Zahn (mm/z)	Rotating speed Drehzahl (min-1)	Feed rate per tooth Vorschub pro Zahn (mm/z)	Rotating speed Drehzahl (min-1)	Feed rate per tooth Vorschub pro Zahn (mm/z)	Rotating speed Drehzahl (min-1)	Feed rate per tooth Vorschub pro Zahn (mm/z)	Rotating speed Drehzahl (min-1)	Feed rate per tooth Vorschub pro Zahn (mm/z)	Rotating speed Drehzahl (min-1)	Feed rate per tooth Vorschub pro Zahn (mm/z)
M5	5300	0.01~0.11	2800	0.01~0.03	5300	0.03~0.10	5300	0.03~0.10	8400	0.03~0.13	7500	0.03~0.10
M6	4800	0.01~0.11	2400	0.01~0.03	4800	0.03~0.10	4800	0.03~0.10	8000	0.03~0.13	7200	0.03~0.10
M8	3850	0.01~0.11	1900	0.01~0.03	3850	0.03~0.10	3850	0.03~0.10	6400	0.03~0.13	5700	0.03~0.10
M10	3200	0.01~0.11	1600	0.01~0.03	3200	0.03~0.10	3200	0.03~0.10	5300	0.03~0.13	4800	0.03~0.10
M12	2400	0.01~0.11	1200	0.01~0.03	2400	0.03~0.10	2400	0.03~0.10	4000	0.03~0.13	3600	0.03~0.10
M16	1900	0.01~0.11	960	0.01~0.03	1900	0.03~0.10	1900	0.03~0.10	3200	0.03~0.13	2900	0.03~0.10
M20	1600	0.01~0.11	800	0.01~0.03	1600	0.03~0.10	1600	0.03~0.10	2650	0.03~0.13	2400	0.03~0.10

1.Water-soluble coolant is recommended for the cutting conditions above.
2.Please adjust the cutting parameter appropriately according to system rigidity.
3.The cutting conditions above is set on the basis of coated grade KTG303. When use uncoated grade YK30F, please reduce the cutting speed and feed rate to the 50%~70% of speed stated above.

1. Bei den obigen Schnittdaten sollte Emulsion eingesetzt werden.
2. Die Schnittdaten sollten entsprechend der Bearbeitungsstabilität angepaßt werden.
3. Die obigen Schnittdaten basieren auf dem Einsatz von VHM Gewindebohrern in der besch. Sorte KMG303. Beim Einsatz der unbeschichteten Hartmetallsorte YK30F sind die Schnittdaten, Schnittgeschw. und Vorschub um 50-70% zu reduzieren.

Terminology of tap · Terminologie von Gewindebohrern



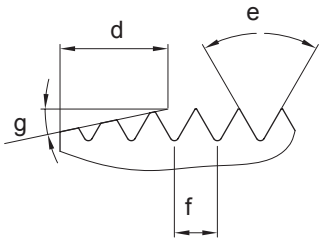


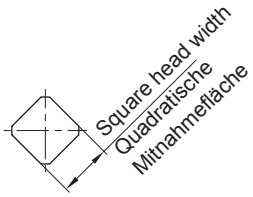
1. Thread length	1. Gewindelänge
2. Neck diameter	2. Hals Durchmesser
3. Square length	3. Schneidenlänge
4. Overall length	4. Gesamtseele

a. Web thickness	a. Kerndurchmesser
b. Margin width	b. Schneidenstärke
c. Chip flute	c. Spanraum

Magnifying chamfer and thread profile

Anschnitt und Gewindeprofil





d. Chamfer length	d. Anschnittlänge
e. Thread profile angle	e. Gewindeprofilwinkel
f. Pitch	f. Steigung
g. Chamfer angle	g. Anschnittwinkel

Different tap's chip flute and features · Spanraum und Anwendung

Type of chip flute Spanraum Typ	Feature Eigenschaften	Application Anwendung
Helical flute tap 	• Helical flute • Tap blind hole to its flat bottom • No chips remain • Good entering performance • Penetrate to pre-hole easily • spiralförmiger Spanraum • Für Sackloch geeignet • Keine Späne in Bohrung • Gute Ausschnittleistung • einfache Zentrierung	• Material generating long curled chips • Blind hole • The hole with axial slot on inner wall • Für langspanende Werkstoffe • Sackloch • Einsatz in Bohrungen mit Nute
Straight flute tap 	• Straight flute • High cutting edge strength • Easy to regrind • Easy selection of chamfer length • gerade genuteter Spanraum • stabile Schneide • leicht nachzuschleifen • Leichte Auswahl (Ausschnitt)	• For machining high hardness material • Material generating powdered form chips • Tap short through and blind hole • Material easy to generate wear • Für Hartbearbeitung • für kurzspanen des Material • für Durchgangs und Sackbohrungen • für verschleißendes Material

Non-standard Taylor made · Sonderwerkzeuge

Name:

Firma/Company:

Fax:

Tel:

E-MAIL:

ZCC-CT
Heltorfer Straße 12
40472 Düsseldorf Germany
Fax: +49-(0)211-989240-111
E-Mail:info@zccct-europe.com

Machining information and Workpiece Material • Bearbeitungsinfo. und Werkstück Material

Hole Shape
Bohrungs-ausführung

☐ Through-hole Durchgangs-bohrung ☐ Blind-hole Sackbohrung

Taper length Gewindelänge ____ mm

Hole tolerance Bohrungstoleranz ____

Status of hole Werkstück Zustand ☐ pre-drill vorbohren ☐ Casting-mold hole gegossene oder geschmiedete Bohrung

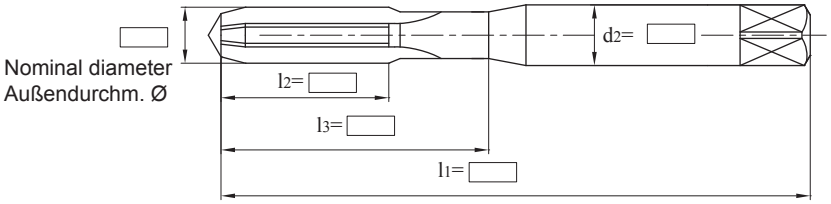
- ☐ Grey cast iron Grauguss
- ☐ Nodular cast iron GGG
- ☐ Aluminium alloy Alu leg.
- ☐ Si Al alloy Si＜10% Si Alu leg.
- ☐ Si Al alloy Si≥10% Si Alu legierung

Machined material trademark
Spezieller Werkstoffstück: ____

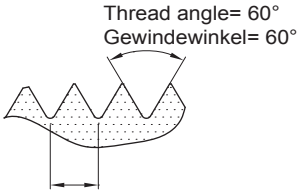
Tensile strength · Zugfestigkeit: ____ N/mm²

Hardness · Härte: ____

Tool information • Werkzeug Information:



thread profil
Gewindeprofil



Pitch ____
Steigung

Tool rotating direction	Drehrichtung
☐	
☐	

Cooling/ Kühlung
☐ External Cooling
☐ Internal Cooling

Coating/ Beschichtung
☐ Yes/ Ja
☐ No/ Nein

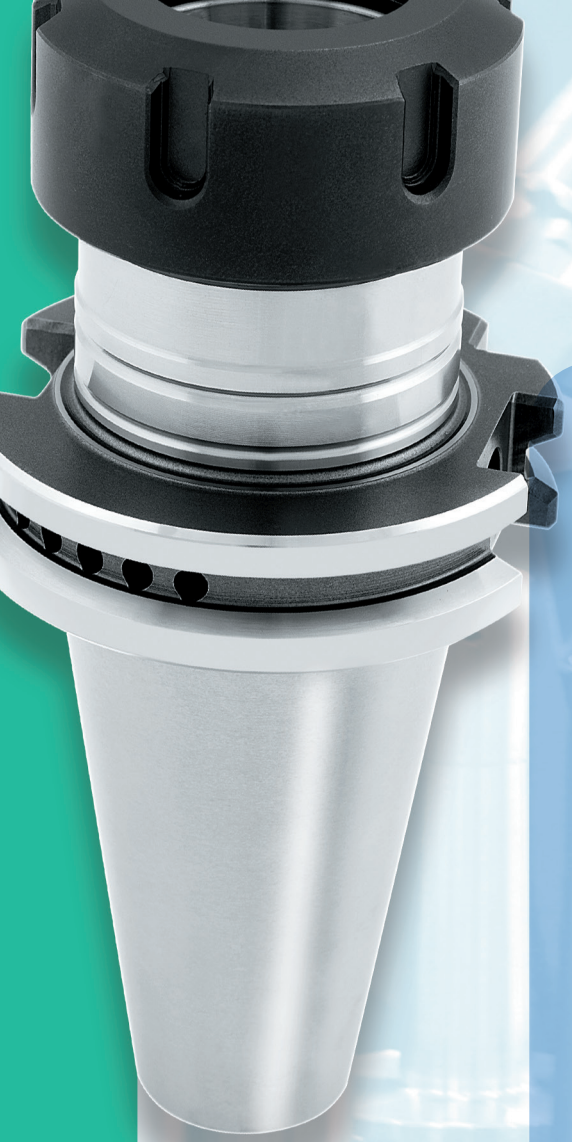
Remarks:
Bemerkungen:

Order quantity: piece
Auftragsmenge: Stück

Expected delivery date:
Lieferdatum:

Date · Datum:

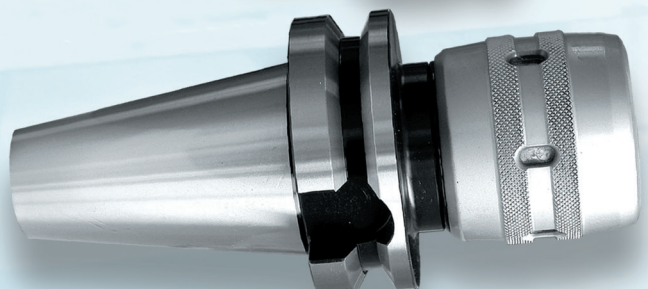
confirmation · Unterschrift:



Tooling systems
Werkzeugsysteme

Tooling systems overview Werkzeugsysteme Übersicht	D 2 - 4
Spring collet chuck Feder Spannzangenaufnahme	D 5 - 7
Collet chuck extension Spannzangenaufnahme (Verlängerung)	D 8
Heavy duty milling collet chuck Stabile Fräseraufnahme mit Spannzange	D 9 - 10
Weldon type chuck Weldon Werkzeugaufnahme	D 11 - 13
Shell mill adapter Fräseraufsteckdorn	D 14 - 18
Adapter for morse taper with flat tail Morsekegelaufnahme mit Austreiblappen	D 19 - 20
Adapter for morse taper without flat tail Morsekegelaufnahme ohne Austreiblappen	D 21 - 22
Side and face milling adapter Scheibenfräseraufnahme	D 23 - 24
Collet Spannzange	D 25 - 29
Spare parts Ersatzteile	D 30 - 31
Technical information Technische Informationen	D 31 - 38





HSK series

HSK-Tooladapter · HSK Werkzeugaufnahme

Spring collet chuck
Feder Spannzangen -aufnahme



D7

Weldon type chuck
Weldon-Aufnahme



D13

Arbor mill adapter
Aufsteckfräser-dorne



D18

JT/BT series

Spring collet chuck
Steilkegel Spannzangenfutter



D5-D6

Heavy duty milling collet chuck
Steilkegel Fräserspannfutter



D9-D10



ER-A ER-UP ER-DM



Collet chuck extension
-optional by your requirement-
Spannzangen Aufnahme (Verlängerung)
-Sonderausführung-



Cylindrical collet for heavy duty milling
ZC-
Hochleistungs-
Fräserspannfutterhülsen
(zylindrisch)



Collet chuck extension
-optional by your requirement-
Spannzangen Aufnahme (Verlängerung)
-Sonderausführung-

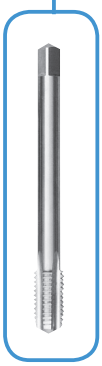


ER-A ER-UP ER-DM ER-GB



ER-A ER-UP ER-DM







JT/BT-Tooladapter · JT/BT Werkzeugaufnahmen

Weldon type chuck
Steilkegel Weldon-Aufnahme



D11-D12

Shell mill adapter
Steilkegel Fräswerkzeug-aufnahme



D14-D17

Morse taper adapter
Steilkegel Morsekegelaufnahmen



D19-D20



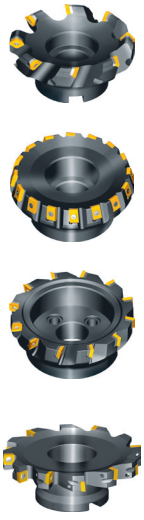
D21-22

Side and face milling adap.
Steilkegel Scheibenfräseraufnahmen



D23-D24









Steilkegel

HSK

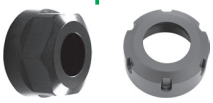
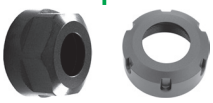
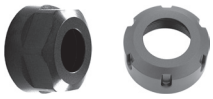
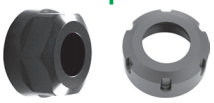
Spring collet chuck
Spannzangenfutter





Spring collet chuck
Feder Spannzangen-aufnahme

Program extensions
Programmerweiterung

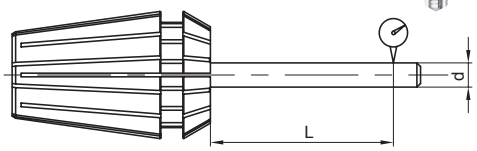
Precise collet Präz. Spannzange	High Precise collet Hoch Präzisions Spannzangen	Mechanical sealed collet (for inner-cooling tools) Mechani. gedichtete Spannz. (für die Innenkühlungszufuhr)	Rigid tapping collet Stabile Spannzange (für Gewindebohrer)
			
ER-A	ER-UP	ER-DM	ER-GB
			
ER11 ER16	ER25 ER32 ER40	ER11 ER16	ER25 ER32 ER40	ER11 ER16	ER25 ER32 ER40	ER11 ER16	ER25 ER32 ER40

Selecting varied collets can enlarge the clamping range. This shank is suitable for drilling, boring ,reaming and part of milling.

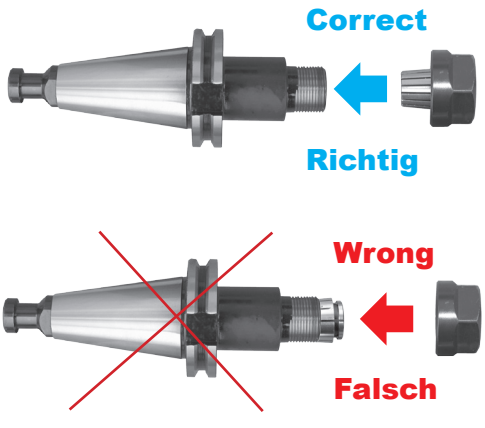


Durch die Auswahl der unterschiedlichen Spannzangen wird das Werkzeugaufnahme-spektrum erweitert.
für Bohrer, Fräser, Reibahlen etc.





Installing method
Montage



ER-A and ER-UP collet run-out comparison table
ER-A und ER-UP Spannzangenrundlauf Abweich.

Clamping range(mm) Spannbereich		Max. Run-out Max. Rundlauf Abweich.(mm)		
d	L	DIN6499/ISO15488 From B	ER-A	ER-UP
1.0~1.6	6.0	0.015	0.010	0.005
1.6~3.0	10.0			
3.0~6.0	16.0			
6.0~10.0	25.0			
10.0~18.0	40.0	0.020	0.010	0.005
18.0~26.0	50.0			
26.0~34.0	60.0	0.025	0.015	0.010

The Max. run-out of ER-A and ER-UP collet both are less than the Max. run-out stated in DIN6499/ISO15488.

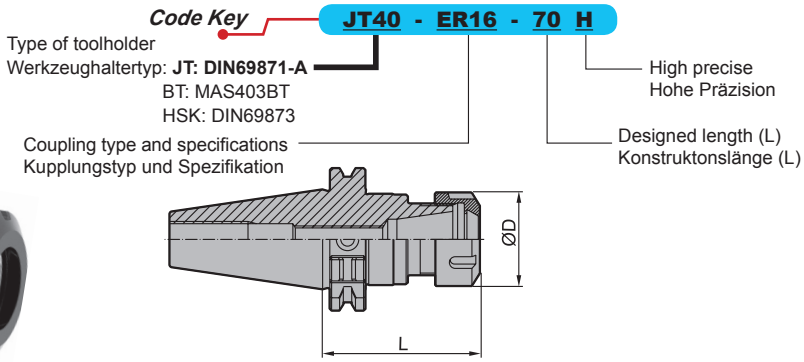
Die max. Rundlaufabweichung ER-A und ER-UP sind geringer als nach DIN6499/ISO15488

JT series

Spring collet chuck

Feder Spannzangenaufnahme





Type · Typ	Taper angle Kegel Winkel	Dimensions (mm) Abmessungen		Nut Mutter	Spare parts · Ersatzteile					Weight Gewicht (kg)
		Ø D	L		Precise collet Präzi. Spannzange	High Precise collet Hoch Präz. Spannz.	Mechanical sealed collet Mech. abgedi. Spannz.	Rigid tapping collet Spannz. Gewindebohr.	Wrench Schlüssel	
JT30-ER16-70H	30	28	70	Hi-Q/ER16	ER16-**A	ER16-**UP	ER16-**DM	ER16-**GB	E16P	0.50
JT30-ER16-100H	30	28	100	Hi-Q/ER16	ER16-**A	ER16-**UP	ER16-**DM	ER16-**GB	E16P	0.61
JT30-ER25-60H	30	42	60	Hi-Q/ER25	ER25-**A	ER25-**UP	ER25-**DM	ER25-**GB	E25	0.51
JT40-ER11-100H	40	19	100	Hi-Q/ER11	ER11-**A	ER11-**UP	ER11-**DM	ER11-**GB	E11P	1.04
JT40-ER16-70H	40	28	70	Hi-Q/ER16	ER16-**A	ER16-**UP	ER16-**DM	ER16-**GB	E16P	1.07
JT40-ER16-100H	40	28	100	Hi-Q/ER16	ER16-**A	ER16-**UP	ER16-**DM	ER16-**GB	E16P	1.18
JT40-ER16-160H	40	28	160	Hi-Q/ER16	ER16-**A	ER16-**UP	ER16-**DM	ER16-**GB	E16P	1.36
JT40-ER25-70H	40	42	70	Hi-Q/ER25	ER25-**A	ER25-**UP	ER25-**DM	ER25-**GB	E25	1.15
JT40-ER25-100H	40	42	100	Hi-Q/ER25	ER25-**A	ER25-**UP	ER25-**DM	ER25-**GB	E25	1.40
JT40-ER25-160H	40	42	160	Hi-Q/ER25	ER25-**A	ER25-**UP	ER25-**DM	ER25-**GB	E25	1.55
JT40-ER32-70H	40	50	70	Hi-Q/ER32	ER32-**A	ER32-**UP	ER32-**DM	ER32-**GB	E32	1.17
JT40-ER32-100H	40	50	100	Hi-Q/ER32	ER32-**A	ER32-**UP	ER32-**DM	ER32-**GB	E32	1.43
JT40-ER32-160H	40	50	160	Hi-Q/ER32	ER32-**A	ER32-**UP	ER32-**DM	ER32-**GB	E32	1.81
JT40-ER40-80H	40	63	80	Hi-Q/ER40	ER40-**A	ER40-**UP	ER40-**DM	ER40-**GB	E40	1.41
JT40-ER40-100H	40	63	100	Hi-Q/ER40	ER40-**A	ER40-**UP	ER40-**DM	ER40-**GB	E40	1.70
JT40-ER40-160H	40	63	160	Hi-Q/ER40	ER40-**A	ER40-**UP	ER40-**DM	ER40-**GB	E40	2.55
JT50-ER16-100H	50	28	100	Hi-Q/ER16	ER16-**A	ER16-**UP	ER16-**DM	ER16-**GB	E16P	3.18
JT50-ER16-160H	50	28	160	Hi-Q/ER16	ER16-**A	ER16-**UP	ER16-**DM	ER16-**GB	E16P	3.47
JT50-ER32-100H	50	50	100	Hi-Q/ER32	ER32-**A	ER32-**UP	ER32-**DM	ER32-**GB	E32	3.36
JT50-ER32-160H	50	50	160	Hi-Q/ER32	ER32-**A	ER32-**UP	ER32-**DM	ER32-**GB	E32	4.25
JT50-ER40-100H	50	63	100	Hi-Q/ER40	ER40-□□A	ER40-**UP	ER40-**DM	ER40-**GB	E40	3.62
JT50-ER40-160H	50	63	160	Hi-Q/ER40	ER40-□□A	ER40-**UP	ER40-□□DM	ER40-**GB	E40	4.20

● Spare parts · Ersatzteile

Name Bezeichnung	Precise collet Präzi. Spannzange	High Precise collet Hoch Präzi. Spannz.	Mechanical sealed collet Mechani. gedicht. Spannz.	Rigid tapping collet stabil für Gewindeb.	Wrench Schlüssel
					
Page · Seite	D25	D26	D27	D28	D30

All products on demand · Alle Produkte auf Anfrage

BT series

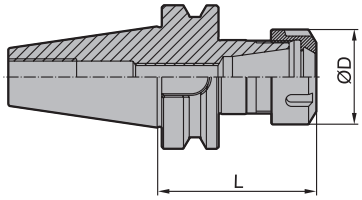
Spring collet chuck

Feder Spannzangenaufnahme

Code Key: **BT40 - ER16 - 70 H**

- Type of toolholder / Werkzeughaltertyp: JT: DIN69871-A; **BT: MAS403BT**; HSK: DIN69873
- Coupling type and specifications / Kupplungstyp und Spezifikation
- Designed length (L) / Konstruktonslänge (L)
- High precise / Hohe Präzision





Type · Typ	Taper angle Kegel Winkel	Dimensions (mm) Abmessungen Ø D	L	Nut Mutter	Spare parts · Ersatzteile: Precise collet Präz. Spannz.	High Precise collet Hoch Präz. Spannz.	Mechanical sealed collet Mech. abgedi. Spannz.	Rigid tapping collet Spannz. Gewindebohr.	Wrench Schlüssel	Weight Gewicht (kg)
BT30-ER16-80H	30	28	80	Hi-Q/ER16	ER16-**A	ER16-**UP	ER16-**DM	ER16-**GB	E16P	0.57
BT30-ER16-100H	30	28	100	Hi-Q/ER16	ER16-**A	ER16-**UP	ER16-**DM	ER16-**GB	E16P	0.67
BT30-ER25-60H	30	42	62.5	Hi-Q/ER25	ER25-**A	ER25-**UP	ER25-**DM	ER25-**GB	E25	0.57
BT30-ER25-100H	30	42	100	Hi-Q/ER25	ER25-**A	ER25-**UP	ER25-**DM	ER25-**GB	E25	0.79
BT40-ER11-100H	40	19	100	Hi-Q/ER11	ER11-**A	ER11-**UP	ER11-**DM	ER11-**GB	E11P	1.16
BT40-ER16-70H	40	28	70	Hi-Q/ER16	ER16-**A	ER16-**UP	ER16-**DM	ER16-**GB	E16P	1.12
BT40-ER16-100H	40	28	100	Hi-Q/ER16	ER16-**A	ER16-**UP	ER16-**DM	ER16-**GB	E16P	1.24
BT40-ER16-160H	40	28	160	Hi-Q/ER16	ER16-**A	ER16-**UP	ER16-**DM	ER16-**GB	E16P	1.33
BT40-ER25-70H	40	42	70	Hi-Q/ER25	ER25-**A	ER25-**UP	ER25-**DM	ER25-**GB	E25	1.20
BT40-ER25-100H	40	42	100	Hi-Q/ER25	ER25-**A	ER25-**UP	ER25-**DM	ER25-**GB	E25	1.49
BT40-ER25-160H	40	42	160	Hi-Q/ER25	ER25-**A	ER25-**UP	ER25-**DM	ER25-**GB	E25	1.54
BT40-ER32-70H	40	50	70	Hi-Q/ER32	ER32-**A	ER32-**UP	ER32-**DM	ER32-**GB	E32	1.25
BT40-ER32-100H	40	50	100	Hi-Q/ER32	ER32-**A	ER32-**UP	ER32-**DM	ER32-**GB	E32	1.53
BT40-ER32-160H	40	50	160	Hi-Q/ER32	ER32-**A	ER32-**UP	ER32-**DM	ER32-**GB	E32	1.74
BT40-ER40-80H	40	63	80	Hi-Q/ER40	ER40-**A	ER40-**UP	ER40-**DM	ER40-**GB	E40	1.46
BT40-ER40-100H	40	63	100	Hi-Q/ER40	ER40-**A	ER40-**UP	ER40-**DM	ER40-**GB	E40	1.79
BT40-ER40-160H	40	63	160	Hi-Q/ER40	ER40-**A	ER40-**UP	ER40-**DM	ER40-**GB	E40	2.66
BT50-ER16-100H	50	28	100	Hi-Q/ER16	ER16-**A	ER16-**UP	ER16-**DM	ER16-**GB	E16P	3.50
BT50-ER16-160H	50	28	160	Hi-Q/ER16	ER16-**A	ER16-**UP	ER16-**DM	ER16-**GB	E16P	4.35
BT50-ER32-100H	50	50	100	Hi-Q/ER32	ER32-**A	ER32-**UP	ER32-**DM	ER32-**GB	E32	4.20
BT50-ER32-160H	50	50	160	Hi-Q/ER32	ER32-**A	ER32-**UP	ER32-**DM	ER32-**GB	E32	4.95
BT50-ER40-100H	50	63	100	Hi-Q/ER40	ER40-**A	ER40-**UP	ER40-**DM	ER40-**GB	E40	4.34
BT50-ER40-160H	50	63	100	Hi-Q/ER40	ER40-**A	ER40-**UP	ER40-**DM	ER40-**GB	E40	5.15

● Spare parts · Ersatzteile

Name Bezeichnung	Precise collet Präzi. Spannzange	High Precise collet Präzi. Spannzange	Mechanical sealed collet Mechani. gedicht. Spannz.	Rigid tapping collet stabil für Gewindeb.	Wrench Schlüssel
					
Page · Seite	D25	D26	D27	D28	D30

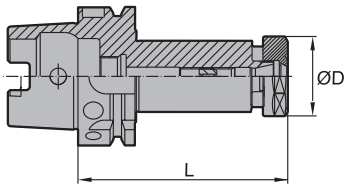
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HSK series

Spring collet chuck

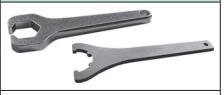
Feder Spannzangenaufnahme





Type · Typ	Dimensions (mm) Abmessungen		Nut Mutter	Spare parts · Ersatzteile					Weight Gewicht (kg)
	Ø D	L		Precise collet Präz. Spannz.	High Precise collet Hoch Präz. Spannz.	Mechanical sealed collet Mech. abgedi. Spannz.	Rigid tapping collet Spannz. Gewindeb.	Wrench Schlüssel	
HSK-A40-ER16-80H	28	80	Hi-Q/ER16	ER16-**A	ER16-**UP	ER16-**DM	ER16-**GB	E16P	0.35
HSK-A40-ER25-80H	42	80	Hi-Q/ER25	ER25-**A	ER25-**UP	ER25-**DM	ER25-**GB	E25	0.51
HSK-A50-ER16-100H	28	100	Hi-Q/ER16	ER16-**A	ER16-**UP	ER16-**DM	ER16-**GB	E16P	0.69
HSK-A50-ER25-80H	42	80	Hi-Q/ER25	ER25-**A	ER25-**UP	ER25-**DM	ER25-**GB	E25	068
HSK-A50-ER32-100H	50	100	Hi-Q/ER32	ER32-**A	ER32-**UP	ER32-**DM	ER32-**GB	E32	0.93
HSK-A63-ER11-100H	19	100	Hi-Q/ER11	ER11-**A	ER11-**UP	ER11-**DM	ER11-**GB	E11P	0.88
HSK-A63-ER16-80H	28	80	Hi-Q/ER16	ER16-**A	ER16-**UP	ER16-**DM	ER16-**GB	E16P	0.87
HSK-A63-ER16-100H	28	100	Hi-Q/ER16	ER16-**A	ER16-**UP	ER16-**DM	ER16-**GB	E16P	0.96
HSK-A63-ER25-80H	42	80	Hi-Q/ER25	ER25-**A	ER25-**UP	ER25-**DM	ER25-**GB	E25	0.93
HSK-A63-ER25-160H	42	160	Hi-Q/ER25	ER25-**A	ER25-**UP	ER25-**DM	ER25-**GB	E25	1.37
HSK-A63-ER32-80H	50	80	Hi-Q/ER32	ER32-**A	ER32-**UP	ER32-**DM	ER32-**GB	E32	1.04
HSK-A63-ER32-100H	50	100	Hi-Q/ER32	ER32-**A	ER32-**UP	ER32-**DM	ER32-**GB	E32	1.19
HSK-A63-ER32-160H	50	160	Hi-Q/ER32	ER32-**A	ER32-**UP	ER32-**DM	ER32-**GB	E32	1.53
HSK-A63-ER40-120H	63	120	Hi-Q/ER40	ER40-**A	ER40-**UP	ER40-**DM	ER40-**GB	E40	1.80
HSK-A63-ER40-160H	63	160	Hi-Q-ER40	ER40-**A	ER40-**UP	ER40-**DM	ER40-**GB	E40	2.26

● Spare parts · Ersatzteile

Name Bezeichnung	Precise collet Präzi. Spannzange	High Precise collet Präzi. Spannzange	Mechanical sealed collet Mechani. gedicht. Spannz.	Rigid tapping collet stabil für Gewindeb.	Wrench Schlüssel
					
Page · Seite	D25	D26	D27	D28	D30

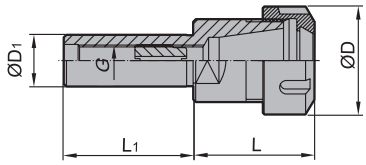
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Collet chuck extension
Spannzangenaufnahme
(Verlängerung)

Code Key G25 - ER25 - 50 H

- Coupling specifications (shank) / Werkzeughaltertyp
- Coupling type and specifications / Kupplungstyp und Spezifikation
- High precise / Hohe Präzision
- Designed length (L) / Konstruktonslänge (L)





Type · Typ	Dimensions(mm) · Abmessungen					Nut Mutter	Spare parts · Ersatzteile	Weight Gewicht (kg)
	ØD	ØD1	L	L1	G		Wrench Schlüssel	
G16-ER16-60H	28	16	36.5	60	M8×1	Hi-Q/ER16	E16P	0.18
G20-ER16-50H	28	20	30.5	50	M12×1	Hi-Q/ER16	E16P	0.18
G20-ER16-100H	28	20	30.5	100	M12×1	Hi-Q/ER16	E16P	0.26
G20-ER25-50H	42	20	47.0	50	M12×1	Hi-Q/ER25	E25	0.33
G20-ER25-100H	42	20	47.0	100	M12×1	Hi-Q/ER25	E25	0.42
G25-ER25-50H	42	25	47.0	50	M18×1	Hi-Q/ER25	E25	0.37
G25-ER25-100H	42	25	47.0	100	M18×1	Hi-Q/ER25	E25	0.47
G25-ER32-50H	50	25	54.0	50	M18×1.5	Hi-Q/ER32	E32	0.51

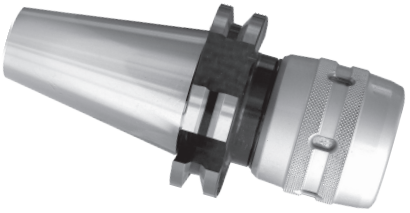
● Spare parts · Ersatzteile

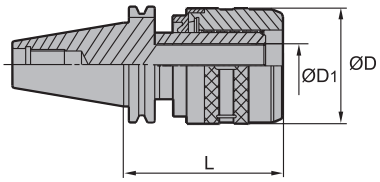
Name Bezeichnung	Precise collet Präzi. Spannzange	High Precise collet Hoch Präzi. Spannz	Mechanical sealed collet Mechani. gedicht. Spannz.	Rigid tapping collet stabil für Gewindeb.	Wrench Schlüssel
					
Page · Seite	D25	D26	D27	D28	D30

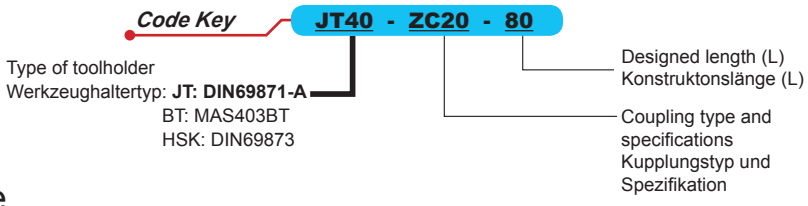
JT series

Heavy duty milling collet chuck

Hochleistungs Fräser Spannzangenaufnahme







Type · Typ	Taper angle Kegelwinkel	Clamping range Spannbereich (mm)	Dimensions(mm)			Spare parts · Ersatzteile		Weight Gewicht (kg)
			ØD	L	ØD1	Cylindrical collet	Wrench Schlüssel	
JT30-ZC20-90	30	6-20	55	90	20	ZC20-	WZC20-J	1.4
JT40-ZC20-85	40	6-20	55	85	20	ZC20-	WZC20-J	2.2
JT40-ZC20-135	40	6-20	55	135	20	ZC20-	WZC20-J	2.6
JT40-ZC32-105	40	6-32	73	105	32	ZC32-	WZC32-J	2.7
JT40-ZC32-150	40	6-32	73	150	32	ZC32-	WZC32-J	3.8
JT50-ZC20-105	50	6-20	55	105	20	ZC20-	WZC20-J	4.5
JT50-ZC32-110	50	6-32	73	110	32	ZC32-	WZC32-J	5.3
JT50-ZC32-165	50	6-32	73	165	32	ZC32-	WZC32-J	6.9

● Spare parts · Ersatzteile

Name Bezeichnung	Cylindrical collet Zylinderbuchse	Wrench Schlüssel
		
Page · Seite	D29	D30

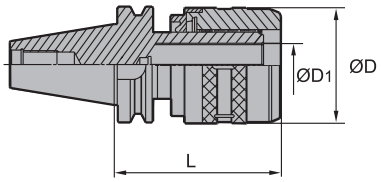
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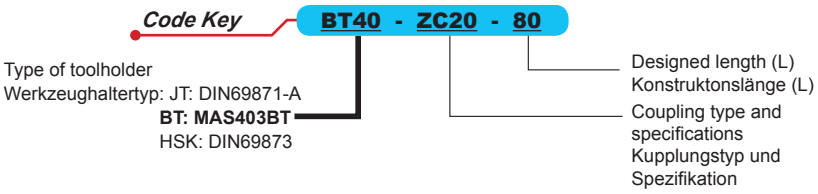
BT series

Heavy duty milling collet chuck

Hochleistungs Fräspannzangenaufnahme



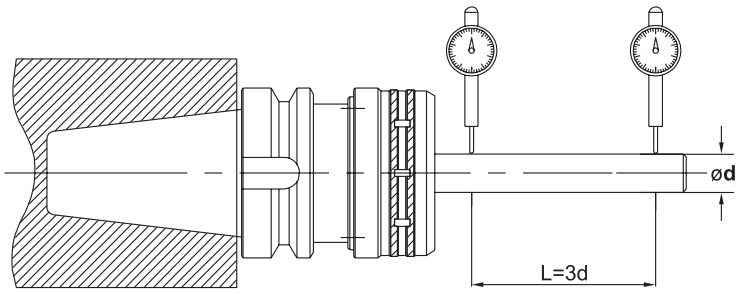




Type · Typ	Taper angle Kegelwinkel	Clamping range (mm)	Dimensions(mm) Abmessungen			Spare parts · Ersatzteile		Weight Gewicht (kg)
			ØD	L	ØD1	Cylindrical collet	Wrench Schlüssel	
BT30-ZC20-90	30	6-20	55	90	20	ZC20-	WZC20-J	1.6
BT40-ZC20-80	40	6-20	55	80	20	ZC20-	WZC20-J	2.4
BT40-ZC20-135	40	6-20	55	135	20	ZC20-	WZC20-J	2.9
BT40-ZC32-105	40	6-32	73	105	32	ZC32-	WZC32-J	3.1
BT40-ZC32-150	40	6-32	73	150	32	ZC32-	WZC32-J	4.1
BT50-ZC20-105	50	6-20	55	105	20	ZC20-	WZC20-J	4.9
BT50-ZC32-110	50	6-32	73	110	32	ZC32-	WZC32-J	5.9
BT50-ZC32-165	50	6-32	73	165	32	ZC32-	WZC32-J	7.8

● Spare parts · Ersatzteile

Name Bezeichnung	Cylindrical collet Zylinderische Buchse	Wrench Schlüssel
		
Page · Seite	D29	D30



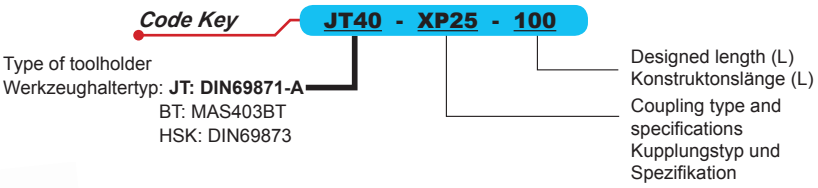
Run-out L=3d≤0.01mm

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JT series

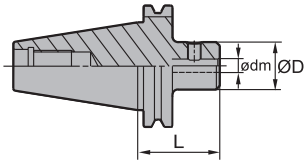
Weldon type chuck

Weldon Werkzeug-aufnahme



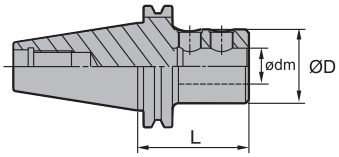
A type





B type





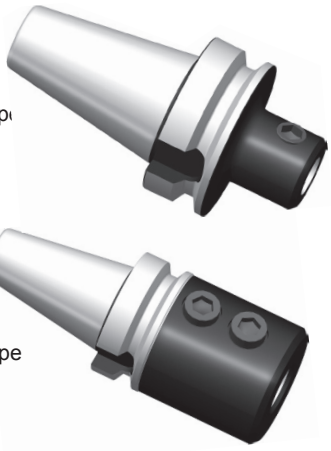
Type · Typ	Taper angle Kegelwinkel	Range of holding Spannbereich ø dm	Dimensions(mm) Abmessungen		Spare parts · Ersatzteile		Type · Typ	Weight Gewicht (kg)
					Screw Schraube	Wrench Schlüssel		
			ØD	L	(GB77-85)			
JT30-XP12-50	30	12	42	50	M12×16	WH60L	A	0.60
JT30-XP16-75	30	16	48	75	M14×16	WH60L	A	0.80
JT30-XP20-75	30	20	52	75	M16×16	WH80L	A	0.98
JT40-XP12-50	40	12	42	50	M12×16	WH60L	A	1.05
JT40-XP16-63	40	16	48	63	M14×16	WH60L	A	1.35
JT40-XP20-70	40	20	52	70	M16×16	WH80L	A	1.40
JT40-XP25-100	40	25	62	100	M18(×2)×20	WH80L	B	2.55
JT40-XP32-110	40	32	72	110	M20(×2)×20	WH80L	B	2.70
JT50-XP12-63	50	12	42	63	M12×16	WH60L	A	2.95
JT50-XP16-80	50	16	48	80	M14×16	WH60L	A	3.25
JT50-XP20-80	50	20	52	80	M16×16	WH80L	A	3.35
JT50-XP25-100	50	25	65	100	M18(×2)×20	WH80L	B	4.15
JT50-XP25-140	50	25	65	140	M18(×2)×20	WH80L	B	4.65
JT50-XP32-105	50	32	72	105	M20(×2)×20	WH80L	B	4.70
JT50-XP32-165	50	32	72	165	M20(×2)×20	WH80L	B	5.85
JT50-XP40-120	50	40	80	120	M20(×2)×20	WH80L	B	6.00

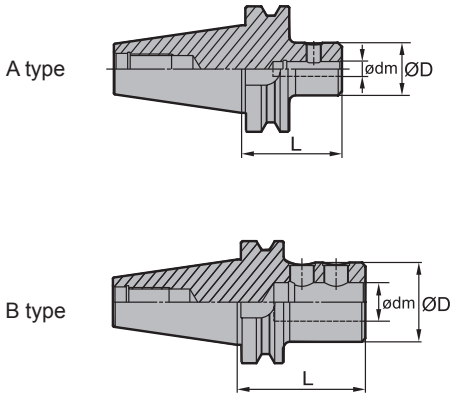
All products on demand · Alle Produkte auf Anfrage

BT series

Weldon type chuck

Weldon Spannzangenfutter





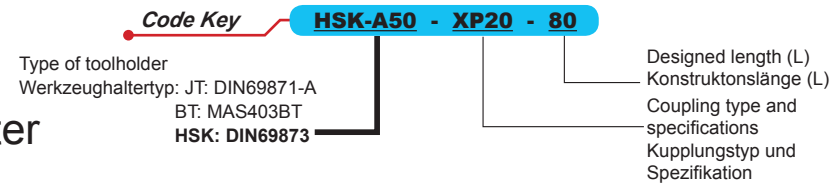
Type · Typ	Taper angle Kegelwinkel	Range of holding Spannbereich ødm	Dimensions(mm) Abmessungen		Spare parts · Ersatzteile		Type · Typ	Weight Gewicht (kg)
			ØD	L	Screw Schraube	Wrench Schlüssel		
					(GB77-85)			
BT30-XP12-50	30	12	42	50	M12×16	WH60L	A	0.67
BT30-XP16-75	30	16	48	75	M14×16	WH60L	A	0.92
BT30-XP20-75	30	20	52	75	M16×16	WH80L	A	1.07
BT40-XP12-63	40	12	42	63	M12×16	WH60L	A	1.22
BT40-XP16-63	40	16	48	63	M14×16	WH60L	A	1.35
BT40-XP20-70	40	20	52	70	M16×16	WH80L	A	1.42
BT40-XP25-90	40	25	62	90	M18(×2)×20	WH80L	B	2.60
BT40-XP32-100	40	32	72	100	M20(×2)×20	WH80L	B	2.75
BT50-XP12-80	50	12	42	80	M12×16	WH60L	A	3.45
BT50-XP16-80	50	16	48	80	M14×16	WH60L	A	4.15
BT50-XP20-80	50	20	52	80	M16×16	WH80L	A	4.25
BT50-XP25-100	50	25	65	100	M18(×2)×20	WH80L	B	4.80
BT50-XP25-165	50	25	65	165	M18(×2)×20	WH80L	B	4.95
BT50-XP32-105	50	32	72	105	M20(×2)×20	WH80L	B	5.10
BT50-XP32-165	50	32	72	165	M20(×2)×20	WH80L	B	6.08
BT50-XP40-120	50	40	80	120	M20(×2)×20	WH80L	B	6.45

All products on demand · Alle Produkte auf Anfrage

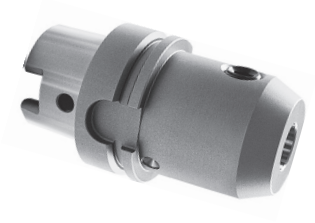
HSK series

Weldon type chuck

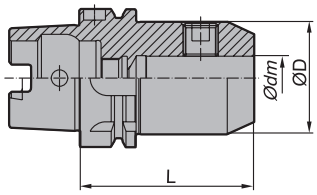
Weldon Spannzangenfutter



A type



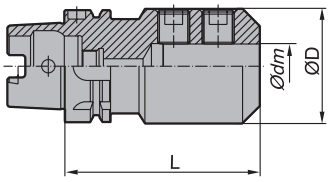
A type



B type



B type

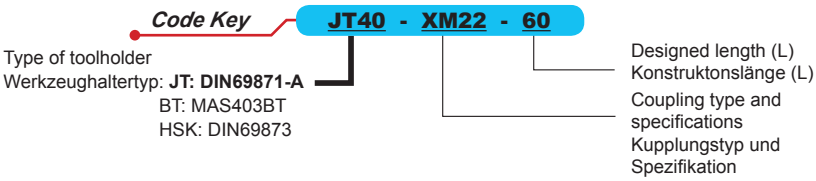


Type · Typ	Range of holding Spannbereich ødm	Dimensions(mm) Abmessungen		Spare parts · Ersatzteile	Type · Typ	Weight Gewicht (kg)
		ØD	L	Wrench Schlüssel		
HSK-A40-XP12-70	12	42	70	WH40L	A	0.61
HSK-A40-XP16-75	16	48	75	WH40L	A	0.64
HSK-A50-XP12-80	12	42	80	WH50L	A	0.90
HSK-A50-XP16-80	16	48	80	WH50L	A	0.97
HSK-A50-XP20-80	20	52	80	WH50L	A	1.68
HSK-A63-XP12-80	12	42	80	WH63L	A	1.15
HSK-A63-XP16-80	16	48	80	WH63L	A	1.29
HSK-A63-XP20-80	20	52	80	WH63L	A	1.36
HSK-A63-XP25-110	25	65	110	WH63L	B	2.29
HSK-A63-XP32-110	32	72	110	WH63L	B	2.58

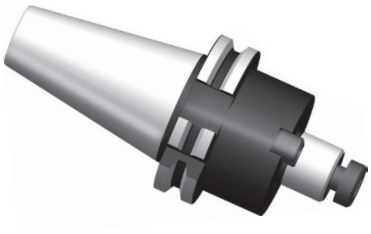
All products on demand · Alle Produkte auf Anfrage

JT series

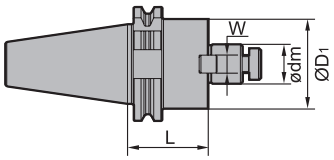
Shell mill abor
Fräseraufsteckdorne



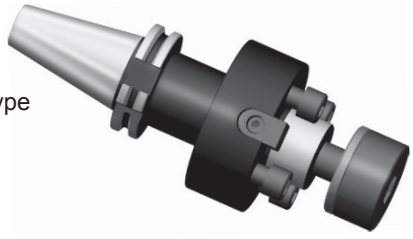
A type



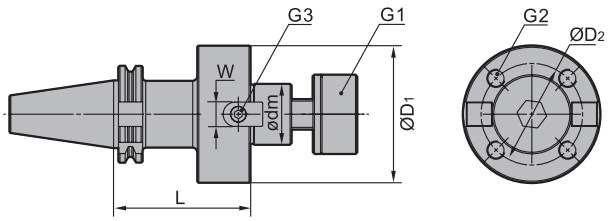
A type



B type



B type



Type · Typ	Taper angle Kegel-winkel	Locating shaft diameter ø dm Schaft Durch-messer	Dimensions(mm) Abmessungen				Spare parts · Ersatzteile						Type Typ	Weight Gewicht (kg)
			Ø D_1	L	Ø D_2	W Key Keil	Screw Schraube G1	Shim Unterlage	Screw Schraube G2 (GB70-85)	Wrench Schlüssel	Key Keil	Screw Schraube G3 (GB70-85)		
														
JT30-XM22-45	30	22	45	45	-	10	LD22	-	-	WH80L	CJ10	M4×10	A	1.20
JT30-XM27-45	30	27	60	45	-	12	LD27	-	-	WH100L	CJ12	M4×10	A	1.23
JT40-XM22-60	40	22	45	60	-	10	LD22	-	-	WH80L	CJ10	M4×10	A	1.25
JT40-XM22-90	40	22	45	90	-	10	LD22	-	-	WH80L	CJ10	M4×10	A	1.30
JT40-XM27-60	40	27	60	60	-	12	LD27	D27	-	WH100L	CJ12	M4×10	A	1.35
JT40-XM27-90	40	27	60	90	-	12	LD27	D27	-	WH100L	CJ12	M4×10	A	1.40
JT40-XM32-75	40	32	70	75	-	14	LD32	D32	-	WH140L	CJ14	M5×12	A	2.00
JT40-XM40-75	40	40	100	75	66.7	16	LD40	D40	M12×40	WH100L WH170L	CJ16	M6×14	B	3.50
JT50-XM22-75	50	22	50	75	-	10	LD22	-	-	WH80L	CJ10	M4×10	A	3.35
JT50-XM27-60	50	27	60	60	-	12	LD27	D27	-	WH100L	CJ12	M4×10	A	3.50
JT50-XM32-75	50	32	70	75	-	14	LD32	D32	-	WH140L	CJ14	M5×12	A	4.00
JT50-XM40-75	50	40	100	75	66.7	16	LD40	D40	M12×40	WH100L WH170L	CJ16	M6×14	B	5.95
JT50-XM60-75	50	60	137	75	101.6	25.4	-	-	M16×45	WH140L	CJ25.4	M8×20	B	7.60

All products on demand · Alle Produkte auf Anfrage

BT series

Shell mill abor
Fräseraufsteckdorne

Code Key **BT40 - XM22 - 60**

Type of toolholder
Werkzeughaltertyp: JT: DIN69871-A
BT: MAS403BT
HSK: DIN69873

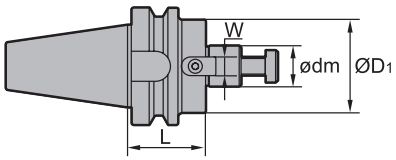
Designed length (L)
Konstruktonslänge (L)

Coupling type and specifications
Kupplungstyp und Spezifikation

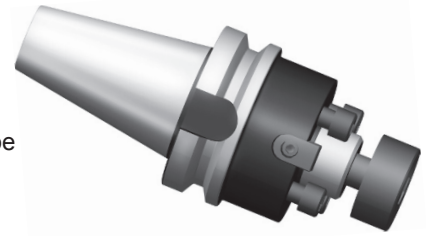
A type



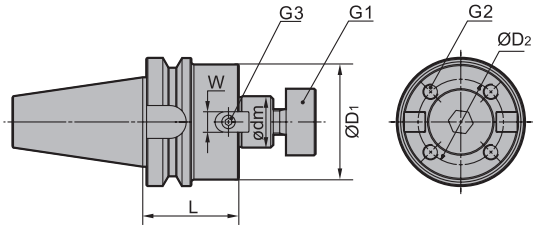
A type



B type



B type



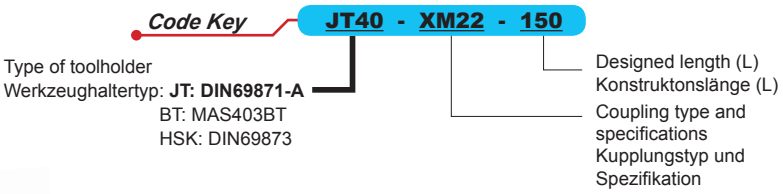
Type · Typ	Taper angle Kegel-winkel	Locating shaft diameter ødm	Dimensions(mm) Abmessungen(mm)				Spare parts · Ersatzteile						Type Typ	Weight Gewicht (kg)
							Screw Schraube G1	Shim	Screw Schraube G2 (GB70-85)	Wrench Schlüssel	Key Keil	Screw G3 (GB70-85)		
			$ØD_1$	L	$ØD_2$	W Key Keil								
BT30-XM22-45	30	22	45	45	-	10	LD22	-	-	WH80L	CJ10	M4×10	A	1.35
BT30-XM27-45	30	27	60	45	-	12	LD27	-	-	WH100L	CJ12	M4×10	A	1.40
BT40-XM22-60	40	22	50	60	-	10	LD22	-	-	WH80L	CJ10	M4×10	A	1.45
BT40-XM22-90	40	22	50	90	-	10	LD22	-	-	WH80L	CJ10	M4×10	A	1.50
BT40-XM27-60	40	27	60	60	-	12	LD27	D27	-	WH100L	CJ12	M4×10	A	1.65
BT40-XM27-90	40	27	60	90	-	12	LD27	D27	-	WH100L	CJ12	M4×10	A	1.79
BT40-XM32-75	40	32	70	75	-	14	LD32	D32	-	WH140L	CJ14	M5×12	A	2.10
BT40-XM40-75	40	40	100	75	66.7	16	LD40	D40	M12×40	WH100L WH170L	CJ16	M6×14	B	3.60
BT50-XM22-75	50	22	50	75	-	10	LD22	-	-	WH80L	CJ10	M4×10	A	4.35
BT50-XM27-60	50	27	60	60	-	12	LD27	D27	-	WH100L	CJ12	M4×10	A	4.50
BT50-XM32-75	50	32	70	75	-	14	LD32	D32	-	WH140L	CJ14	M5×12	A	4.95
BT50-XM40-75	50	40	100	75	66.7	16	LD40	D40	M12×40	WH100L WH170L	CJ16	M6×14	B	6.95
BT50-XM60-75	50	60	137	75	101.6	25.4	-	-	M16×45	WH140L	CJ25.4	M8×20	B	8.60

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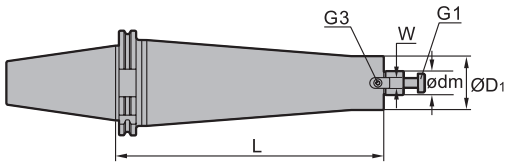
JT series

Extended shell mill abor

Fräseraufsteckdorne (lang)







Type · Typ	Taper angle Kegelwinkel	Locating shaft diameter ø dm Schaft Durch-messer	Dimensions (mm) Abmessungen			Spares · Ersatzteile				Weight Gewicht (kg)
						Screw Schraube G1	Wrench Schlüssel	Key Keil	Screw Schraube G3 (GB70-85)	
			ØD1	L	W Key Keil width					
JT40-XM22-120	40	22	45	120	10	LD22	WH80L	CJ10	M4×10	2.30
JT40-XM22-150	40	22	45	150	10	LD22	WH80L	CJ10	M4×10	2.50
JT40-XM22-200	40	22	45	200	10	LD22	WH80L	CJ10	M4×10	4.35
JT50-XM22-120	50	22	45	120	10	LD22	WH80L	CJ10	M4×10	6.35
JT50-XM22-150	50	22	45	150	10	LD22	WH80L	CJ10	M4×10	6.80
JT50-XM22-200	50	22	45	200	10	LD22	WH80L	CJ10	M4×10	7.45
JT50-XM22-250	50	22	45	250	10	LD22	WH80L	CJ10	M4×10	7.80

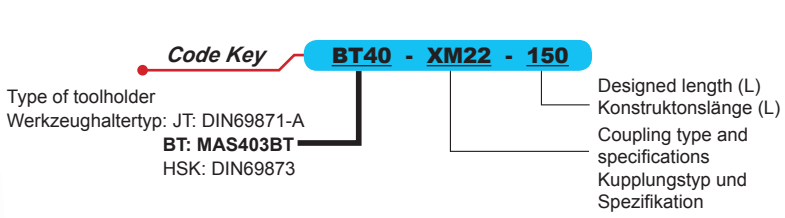
All products on demand · Alle Produkte auf Anfrage

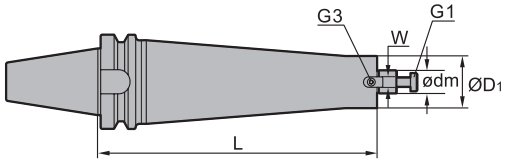
BT series

Extended shell mill abor

Fräseraufsteckdorne (lang)





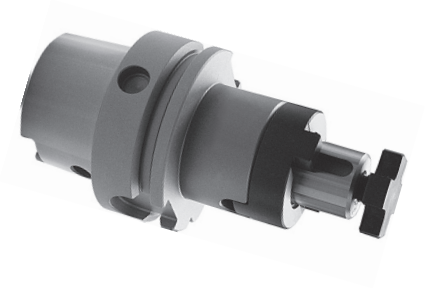


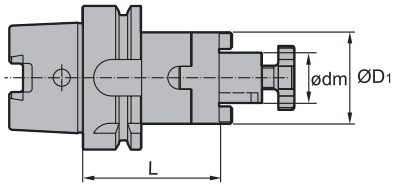
Type · Typ	Taper angle Kegel-winkel	Locating shaft diameter ø dm Schaft Durch-messer	Dimensions(mm) Abmessungen			Spares · Ersatzteile				Weight Gewicht (kg)
						Screw Schraube G1	Wrench Schlüssel	Key Keil	Screw Schraube G3 (GB70-85)	
			ØD1	L	W Key Keil					
BT40-XM22-120	40	22	50	120	10	LD22	WH80L	CJ10	M4×10	2.43
BT40-XM22-150	40	22	50	150	10	LD22	WH80L	CJ10	M4×10	2.65
BT40-XM22-200	40	22	50	200	10	LD22	WH80L	CJ10	M4×10	4.50
BT50-XM22-120	50	22	50	120	10	LD22	WH80L	CJ10	M4×10	6.55
BT50-XM22-150	50	22	50	150	10	LD22	WH80L	CJ10	M4×10	6.90
BT50-XM22-200	50	22	50	200	10	LD22	WH80L	CJ10	M4×10	7.55
BT50-XM22-250	50	22	50	250	10	LD22	WH80L	CJ10	M4×10	8.15

All products on demand · Alle Produkte auf Anfrage

HSK series

Shell mill abor
Fräseraufsteckdorne





Type · Typ	Locating shaft diameter ø dm Schaft Durch-messer	Dimensions (mm) Abmessungen		Spares · Ersatzteile	Weight Gewicht (kg)
		ØD1	L	Wrench Schlüssel	
HSK-A40-XM22-50	22	40	50	FDS22	0.61
HSK-A50-XM22-50	22	40	50	FDS22	0.73
HSK-A50-XM27-65	27	48	65	FDS27	1.03
HSK-A50-XM32-65	32	58	65	FDS32	1.22
HSK-A63-XM22-60	22	40	60	FDS22	1.08
HSK-A63-XM27-60	27	48	60	FDS27	1.28
HSK-A63-XM32-60	32	58	60	FDS32	1.52
HSK-A63-XM40-70	40	70	70	FDS40	2.15

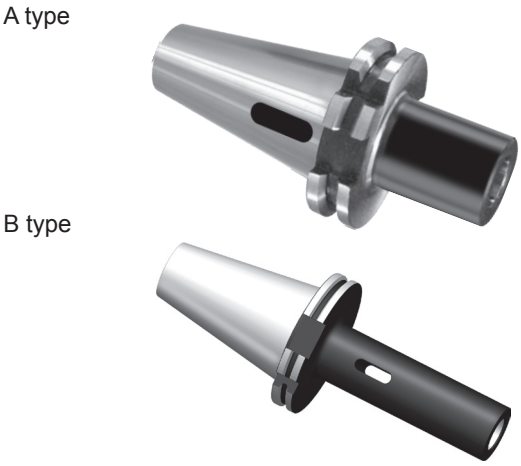
● Spare parts · Ersatzteile

Name Bezeichnung	Wrench Schlüssel
	
Page · Seite	D30

JT series

Adapter for morse taper with flat tail

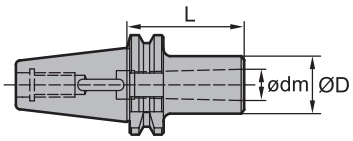
Morsekegelaufnahmen mit Austreiblappen



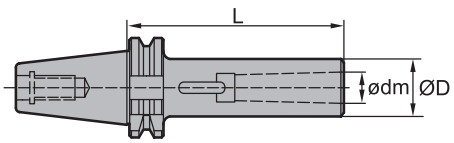
A type

B type

A type



B type



Type · Typ	Taper angle Kegelwinkel	Taper hole Kegelbohr.	Corresponding drill diameter Bohrdurchm. (mm)	Dimensions(mm) Abmessungen			Type · Typ	Weight Gewicht (kg)
				ØD	Ødm	L		
JT40-M1-45	40	MT1	3-14	25	12.065	45	A	0.90
JT40-M1-120	40	MT1	3-14	25	12.065	120	B	1.20
JT40-M2-60	40	MT2	14-23	32	17.780	60	A	0.90
JT40-M2-120	40	MT2	14-23	32	17.780	120	B	1.30
JT40-M3-75	40	MT3	23-32	40	23.825	75	A	1.11
JT40-M3-135	40	MT3	23-32	40	23.825	135	B	1.71
JT40-M4-95	40	MT4	32-50	50	31.267	95	A	1.42
JT40-M4-165	40	MT4	32-50	50	31.267	165	B	2.40
JT50-M1-45	50	MT1	3-14	25	12.065	45	A	2.71
JT50-M1-120	50	MT1	3-14	25	12.065	120	B	3.01
JT50-M1-180	50	MT1	3-14	25	12.065	180	B	3.20
JT50-M2-45	50	MT2	14-23	32	17.780	45	A	2.71
JT50-M2-135	50	MT2	14-23	32	17.780	135	B	3.30
JT50-M2-180	50	MT2	14-23	32	17.780	180	B	3.51
JT50-M3-75	50	MT3	23-32	40	23.825	75	A	2.90
JT50-M3-150	50	MT3	23-32	40	23.825	150	B	3.70
JT50-M3-180	50	MT3	23-32	40	23.825	180	B	4.01
JT50-M4-75	50	MT4	32-50	50	31.267	75	A	2.90
JT50-M4-180	50	MT4	32-50	50	31.267	180	B	4.50
JT50-M5-105	50	MT5	50-75	70	44.399	105	A	3.70

All products on demand · Alle Produkte auf Anfrage

BT series

Adapter for morse taper with flat tail

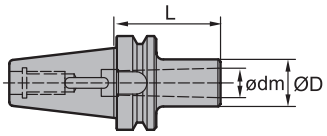
Morsekegelaufnahmen mit Austreiblappen



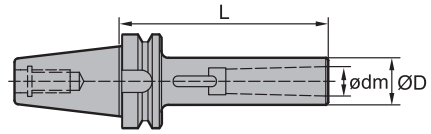
A type

B type

A type



B type



Type · Typ	Taper angle Kegelwinkel	Taper hole Kegelbohr.	Corresponding drill diameter Bohrdurchm. (mm)	Dimensions(mm) Abmessungen			Type Typ	Weight Gewicht (kg)
				ØD	Ødm	L		
BT40-M1-45	40	MT1	3-14	25	12.065	45	A	1.01
BT40-M1-120	40	MT1	3-14	25	12.065	120	B	1.30
BT40-M2-60	40	MT2	14-23	32	17.780	60	A	1.11
BT40-M2-120	40	MT2	14-23	32	17.780	120	B	1.40
BT40-M3-75	40	MT3	23-32	40	23.825	75	A	1.21
BT40-M3-135	40	MT3	23-32	40	23.825	135	B	1.80
BT40-M4-95	40	MT4	32-50	50	31.267	95	A	1.11
BT40-M4-165	40	MT4	32-50	50	31.267	165	B	1.70
BT50-M1-45	50	MT1	3-14	25	12.065	45	A	3.60
BT50-M1-120	50	MT1	3-14	25	12.065	120	B	3.91
BT50-M1-180	50	MT1	3-14	25	12.065	180	B	4.21
BT50-M2-45	50	MT2	14-23	32	17.780	45	A	3.60
BT50-M2-135	50	MT2	14-23	32	17.780	135	B	4.20
BT50-M2-180	50	MT2	14-23	32	17.780	180	B	4.41
BT50-M3-75	50	MT3	23-32	40	23.825	75	A	3.70
BT50-M3-150	50	MT3	23-32	40	23.825	150	B	4.50
BT50-M3-180	50	MT3	23-32	40	23.825	180	B	4.80
BT50-M4-75	50	MT4	32-50	50	31.267	75	A	3.51
BT50-M4-180	50	MT4	32-50	50	31.267	180	B	5.20
BT50-M5-107	50	MT5	50-75	70	44.399	107	A	5.90

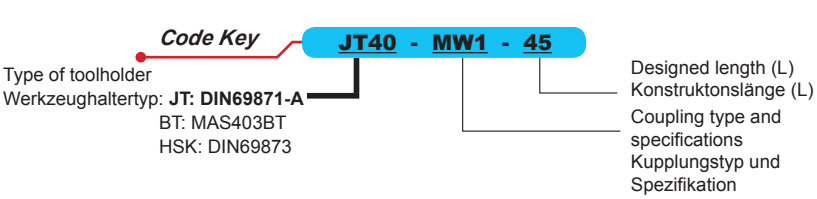
All products on demand · Alle Produkte auf Anfrage

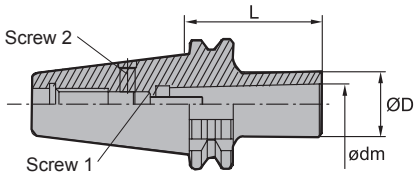
JT series

Adapter for morse taper without flat tail

Morsekegelaufnahmen ohne Austreiblappen







Type · Typ	Taper angle Kegelwinkel	Taper hole Kegel-bohrung	Corresponding drill diameter Bohrdurchm. (mm)	Dimensions(mm) Abmessungen			Spares · Ersatzteile			Weight Gewicht (kg)
							Screw Schraube 1	Wrench Schlüssel	Screw Schraube 2	
				ØD	Ødm	L	 (GB70-85)		 (GB77-85)	
JT40-MW1-45	40	MT1	6-12	27	12.065	45	M6×30	WH50L	-	0.91
JT40-MW2-50	40	MT2	14-20	32	17.780	50	M10×30	WH80L	-	0.91
JT40-MW3-75	40	MT3	22-36	40	23.825	75	M12×40	WH100L	M5×6	1.10
JT40-MW4-95	40	MT4	32-56	50	31.267	95	M16×40T	WH120L	M5×6	1.40
JT50-MW1-45	50	MT1	6-12	27	12.065	45	M6×30	WH50L	-	2.70
JT50-MW2-60	50	MT2	14-20	32	17.780	60	M10×30	WH50L	-	2.81
JT50-MW3-65	50	MT3	22-36	40	23.825	65	M12×40	WH100L	-	2.90
JT50-MW4-75	50	MT4	32-56	50	31.267	75	M16×40	WH140L	M5×12	2.90
JT50-MW5-105	50	MT5	40-63	78	44.399	105	M20×40	WH170L	M5×12	4.41

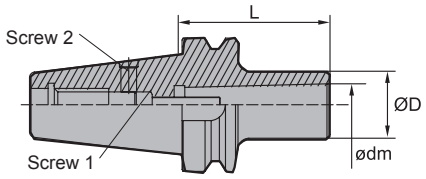
All products on demand · Alle Produkte auf Anfrage

BT series

Adapter for morse taper without flat tail

Morsekegelaufnahmen ohne Austreiblappen





Type · Typ	Taper angle Kegelwinkel	Taper hole Kegelbohr.	Corresponding drill diameter Bohrdurchm. (mm)	Dimensions(mm) Abmessungen			Spares · Ersatzteile			Weight Gewicht (kg)
							Screw Schraube 1	Wrench Schlüssel	Screw Schraube 2	
				ØD	Ødm	L	(GB70-85)		(GB77-85)	
BT40-MW1-50	40	MT1	6-12	27	12.065	50	M6×30	WH50L	-	1.02
BT40-MW2-64	40	MT2	14-20	32	17.780	64	M10×30	WH80L	-	1.08
BT40-MW3-76	40	MT3	22-36	40	23.825	76	M12×40	WH100L	M5×6	1.21
BT40-MW4-103	40	MT4	32-56	50	31.267	103	M16×40T	WH120L	M5×6	1.51
BT50-MW1-45	50	MT1	6-12	27	12.065	45	M6×30	WH50L	-	3.60
BT50-MW2-60	50	MT2	14-20	32	17.780	60	M10×30	WH50L	-	3.70
BT50-MW3-65	50	MT3	22-36	40	23.825	65	M12×40	WH100L	-	3.74
BT50-MW4-75	50	MT4	32-56	50	31.267	75	M16×40	WH140L	M5×12	3.82
BT50-MW5-105	50	MT5	40-63	78	44.399	105	M20×40	WH170L	M5×12	4.72

All products on demand · Alle Produkte auf Anfrage

JT series

Side and face milling adapter

Scheibenfräseraufnahme

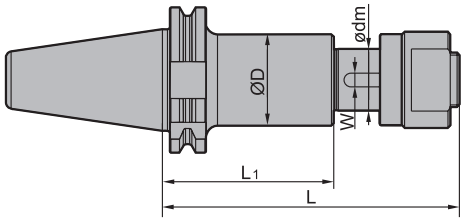


Code Key: **JT40 - XS32 - 90**

Type of toolholder
Werkzeughaltertyp: **JT: DIN69871-A**
BT: MAS403BT
HSK: DIN69873

Designed length (L)
Konstruktonslänge (L)

Coupling type and specifications
Kupplungstyp und Spezifikation



Type · Typ	Taper angle Kegel-winkel	Dimensions (mm) Abmessungen					Spares · Ersatzteile			Weight Gewicht (kg)
		ØD	Ødm	L_1	L	W Key Keil width	Nut Mutter	Key Schlüssel	Shim Unterlage	
JT40-XS27-75	40	40	27	75	130	6	LM24	A6×21	K27	1.79
JT40-XS27-120	40	40	27	120	175	6	LM24	A6×21	K27	2.23
JT40-XS32-90	40	46	32	90	150	8	LM30	A8×22	K32	2.38
JT50-XS27-90	50	40	27	90	145	6	LM24	A6×21	K27	3.85
JT50-XS-27-135	50	40	27	135	190	6	LM24	A6×21	K27	4.29
JT50-XS32-90	50	46	32	90	150	8	LM30	A8×22	K32	4.29
JT50-XS32-135	50	46	32	135	195	8	LM30	A8×22	K32	4.88
JT50-XS40-90	50	55	40	90	156	10	LM36	A10×23	K40	5.00
JT50-XS40-135	50	55	40	135	201	10	LM36	A10×23	K40	5.82
JT50-XS50-100	50	63	50	100	150	12	LM48	A12×23	K50	6.43
JT50-XS50-140	50	63	50	140	210	12	LM48	A12×23	K50	7.50

All products on demand · Alle Produkte auf Anfrage

BT series

Side and face milling adapter

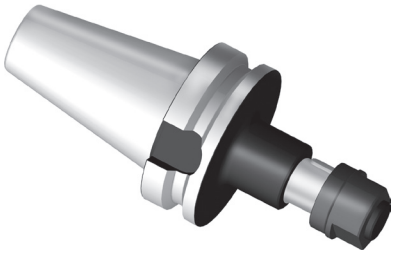
Scheibenfräseraufnahme

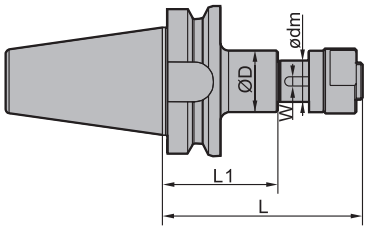
Code Key **BT40 - XS32 - 90**

Type of toolholder
Werkzeughaltertyp: JT: DIN69871-A
BT: MAS403BT
HSK: DIN69873

Designed length (L)
Konstruktonslänge (L)

Coupling type and specifications
Kupplungstyp und Spezifikation





Type · Typ	Taper angle Kegel-winkel	Dimensions(mm) Abmessungen					Spares · Ersatzteile			Weight Gewicht (kg)
		ØD	Ødm	L_1	L	W Key Keil width	Nut Mutter	Key Schlüssel	Shim Unterlage	
BT40-XS27-75	40	40	27	75	130	6	LM24	A6×21	K27	4.49
BT40-XS27-120	40	40	27	120	175	6	LM24	A6×21	K27	4.93
BT40-XS32-90	40	40	32	90	150	8	LM30	A8×22	K32	5.01
BT50-XS27-90	50	40	27	90	145	6	LM24	A6×21	K27	4.66
BT50-XS27-135	50	40	27	135	190	6	LM24	A6×21	K27	5.08
BT50-XS32-90	50	46	32	90	150	8	LM30	A8×22	K32	4.95
BT50-XS32-135	50	46	32	135	195	8	LM30	A8×22	K32	5.59
BT50-XS40-90	50	55	40	90	156	10	LM36	A10×23	K40	5.47
BT50-XS40-135	50	55	40	135	201	10	LM36	A10×23	K40	6.42
BT50-XS50-100	50	63	50	100	150	12	LM48	A12×23	K50	6.94
BT50-XS50-140	50	63	50	140	210	12	LM48	A12×23	K50	8.01

All products on demand · Alle Produkte auf Anfrage

ER-A collet (precise)
ER-A Spannzangen (Präzise)



ER11-**A		ER16-**A		ER25-**A	
Clamping range Spannbereich (mm)	Type · Typ	Clamping range Spannbereich (mm)	Type · Typ	Clamping range Spannbereich (mm)	Type · Typ
1.00-0.50	**ER11-1A**	1.00-0.50	**ER16-1A**	2.00-1.00	**ER25-2A**
2.00-1.50	**ER11-2A**	2.00-1.00	**ER16-2A**	3.00-2.00	**ER25-3A**
3.00-2.50	**ER11-3A**	3.00-2.00	**ER16-3A**	4.00-3.00	**ER25-4A**
4.00-3.50	**ER11-4A**	4.00-3.00	**ER16-4A**	5.00-4.00	**ER25-5A**
5.00-4.50	**ER11-5A**	5.00-4.00	**ER16-5A**	6.00-5.00	**ER25-6A**
6.00-5.50	**ER11-6A**	6.00-5.00	**ER16-6A**	7.00-6.00	**ER25-7A**
7.00-6.50	**ER11-7A**	7.00-6.00	**ER16-7A**	8.00-7.00	**ER25-8A**
		8.00-7.00	**ER16-8A**	9.00-8.00	**ER25-9A**
		9.00-8.00	**ER16-9A**	10.00-9.00	**ER25-10A**
		10.00-9.00	**ER16-10A**	11.00-10.00	**ER25-11A**
				12.00-11.00	**ER25-12A**
				13.00-12.00	**ER25-13A**
				14.00-13.00	**ER25-14A**
				15.00-14.00	**ER25-15A**
				16.00-15.00	**ER25-16A**

ER32-**A							
Clamping range Spannbereich (mm)	Type · Typ	Clamping range Spannbereich (mm)	Type · Typ	Clamping range Spannbereich (mm)	Type · Typ	Clamping range Spannbereich (mm)	Type · Typ
3.00-2.00	**ER32-3A**	8.00-7.00	**ER32-8A**	13.00-12.00	**ER32-13A**	18.00-17.00	**ER32-18A**
4.00-3.00	**ER32-4A**	9.00-8.00	**ER32-9A**	14.00-13.00	**ER32-14A**	19.00-18.00	**ER32-19A**
5.00-4.00	**ER32-5A**	10.00-9.00	**ER32-10A**	15.00-14.00	**ER32-15A**	20.00-19.00	**ER32-20A**
6.00-5.00	**ER32-6A**	11.00-10.00	**ER32-11A**	16.00-15.00	**ER32-16A**		
7.00-6.00	**ER32-7A**	12.00-11.00	**ER32-12A**	17.00-16.00	**ER32-17A**		
ER40-**A							
Clamping range Spannbereich (mm)	Type · Typ	Clamping range Spannbereich (mm)	Type · Typ	Clamping range Spannbereich (mm)	Type · Typ	Clamping range Spannbereich (mm)	Type · Typ
4.00-3.00	**ER40-4A**	10.00-9.00	**ER40-10A**	16.00-15.00	**ER40-16A**	22.00-21.00	**ER40-22A**
5.00-4.00	**ER40-5A**	11.00-10.00	**ER40-11A**	17.00-16.00	**ER40-17A**	23.00-22.00	**ER40-23A**
6.00-5.00	**ER40-6A**	12.00-11.00	**ER40-12A**	18.00-17.00	**ER40-18A**	24.00-23.00	**ER40-24A**
7.00-6.00	**ER40-7A**	13.00-12.00	**ER40-13A**	19.00-18.00	**ER40-19A**	25.00-24.00	**ER40-25A**
8.00-7.00	**ER40-8A**	14.00-13.00	**ER40-14A**	20.00-19.00	**ER40-20A**	26.00-25.00	**ER40-26A**
9.00-8.00	**ER40-9A**	15.00-14.00	**ER40-15A**	21.00-20.00	**ER40-21A**		

All products on demand · Alle Produkte auf Anfrage

ER-UP collet (high precise)
ER-UP Spannzangen (hoch präszise)



ER11-**UP		ER16-**UP		ER25-**UP	
Clamping range Spannbereich (mm)	Type · Typ	Clamping range Spannbereich (mm)	Type · Typ	Clamping range Spannbereich (mm)	Type · Typ
1.00-0.50	**ER11-1UP**	1.00-0.50	**ER16-1UP**	2.00-1.00	**ER25-2UP**
2.00-1.50	**ER11-2UP**	2.00-1.00	**ER16-2UP**	3.00-2.00	**ER25-3UP**
3.00-2.50	**ER11-3UP**	3.00-2.00	**ER16-3UP**	4.00-3.00	**ER25-4UP**
4.00-3.50	**ER11-4UP**	4.00-3.00	**ER16-4UP**	5.00-4.00	**ER25-5UP**
5.00-4.50	**ER11-5UP**	5.00-4.00	**ER16-5UP**	6.00-5.00	**ER25-6UP**
6.00-5.50	**ER11-6UP**	6.00-5.00	**ER16-6UP**	7.00-6.00	**ER25-7UP**
7.00-6.50	**ER11-7UP**	7.00-6.00	**ER16-7UP**	8.00-7.00	**ER25-8UP**
		8.00-7.00	**ER16-8UP**	9.00-8.00	**ER25-9UP**
		9.00-8.00	**ER16-9UP**	10.00-9.00	**ER25-10UP**
		10.00-9.00	**ER16-10UP**	11.00-10.00	**ER25-11UP**
				12.00-11.00	**ER25-12UP**
				13.00-12.00	**ER25-13UP**
				14.00-13.00	**ER25-14UP**
				15.00-14.00	**ER25-15UP**
				16.00-15.00	**ER25-16UP**

ER32-**UP							
Clamping range Spannbereich (mm)	Type · Typ	Clamping range Spannbereich (mm)	Type · Typ	Clamping range Spannbereich (mm)	Type · Typ	Clamping range Spannbereich (mm)	Type · Typ
3.00-2.00	**ER32-3UP**	8.00-7.00	**ER32-8UP**	13.00-12.00	**ER32-13UP**	18.00-17.00	**ER32-18UP**
4.00-3.00	**ER32-4UP**	9.00-8.00	**ER32-9UP**	14.00-13.00	**ER32-14UP**	19.00-18.00	**ER32-19UP**
5.00-4.00	**ER32-5UP**	10.00-9.00	**ER32-10UP**	15.00-14.00	**ER32-15UP**	20.00-19.00	**ER32-20UP**
6.00-5.00	**ER32-6UP**	11.00-10.00	**ER32-11UP**	16.00-15.00	**ER32-16UP**		
7.00-6.00	**ER32-7UP**	12.00-11.00	**ER32-12UP**	17.00-16.00	**ER32-17UP**		
ER40-**UP							
Clamping range Spannbereich (mm)	Type · Typ	Clamping range Spannbereich (mm)	Type · Typ	Clamping range Spannbereich (mm)	Type · Typ	Clamping range Spannbereich (mm)	Type · Typ
4.00-3.00	**ER40-4UP**	10.00-9.00	**ER40-10UP**	16.00-15.00	**ER40-16UP**	22.00-21.00	**ER40-22UP**
5.00-4.00	**ER40-5UP**	11.00-10.00	**ER40-11UP**	17.00-16.00	**ER40-17UP**	23.00-22.00	**ER40-23UP**
6.00-5.00	**ER40-6UP**	12.00-11.00	**ER40-12UP**	18.00-17.00	**ER40-18UP**	24.00-23.00	**ER40-24UP**
7.00-6.00	**ER40-7UP**	13.00-12.00	**ER40-13UP**	19.00-18.00	**ER40-19UP**	25.00-24.00	**ER40-25UP**
8.00-7.00	**ER40-8UP**	14.00-13.00	**ER40-14UP**	20.00-19.00	**ER40-20UP**	26.00-25.00	**ER40-26UP**
9.00-8.00	**ER40-9UP**	15.00-14.00	**ER40-15UP**	21.00-20.00	**ER40-21UP**		

All products on demand · Alle Produkte auf Anfrage

ER-DM Mechanical sealed collet*
ER-DM Mechani. gedicht. Spannzange*



ER16-**DM		ER25-**DM		ER32-**DM	
Clamping range Spannbereich (mm)	Type · Typ	Clamping range Spannbereich (mm)	Type · Typ	Clamping range Spannbereich (mm)	Type · Typ
3.00-2.50	**ER16-3DM**	6.00-5.50	**ER25-6DM**	6.00-5.50	**ER32-6DM**
4.00-3.50	**ER16-4DM**	8.00-7.50	**ER25-8DM**	8.00-7.50	**ER32-8DM**
5.00-4.50	**ER16-5DM**	10.00-9.50	**ER25-10DM**	10.00-9.50	**ER32-10DM**
6.00-5.50	**ER16-6DM**	12.00-11.50	**ER25-12DM**	12.00-11.50	**ER32-12DM**
7.00-6.50	**ER16-7DM**	14.00-13.50	**ER25-14DM**	14.00-13.50	**ER32-14DM**
8.00-7.50	**ER16-8DM**	16.00-15.50	**ER25-16DM**	16.00-15.50	**ER32-16DM**
9.00-8.50	**ER16-9DM**			18.00-17.50	**ER32-18DM**
10.00-9.50	**ER16-10DM**			20.00-19.50	**ER32-20DM**

* For internal-cooling tools
* Für Innenkühlung

ER-GB Rigid tapping collet
ER-GB Spannzangen für Gewindebohrer



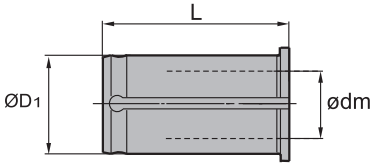
ER16-**GB				ER25-**GB			
Type · Typ	Shank diameter Schaft Ø (mm)	Square head 4 Kant (mm)	Applicable standard NORM	Type · Typ	Shank diameter Schaft Ø (mm)	Square head 4 Kant (mm)	Applicable standard NORM
ER16-4GB	4.0	3.0	ISO,JIS	**ER25-4GB**	4.0	3.0	ISO,JIS
ER16-5GB	5.0	4.0	ISO,JIS	**ER25-5GB**	5.0	4.0	ISO,JIS
ER16-6GB	6.0	4.9	DIN	**ER25-6GB**	6.0	4.9	DIN
ER16-7GB	7.0	5.5	DIN,JIS	**ER25-7GB**	7.0	5.5	DIN,JIS
ER16-8GB	8.0	6.2/6.3	DIN,ISO	**ER25-8GB**	8.0	6.2/6.3	DIN,ISO
ER16-9GB	9.0	7.0/7.1	DIN,ISO	**ER25-9GB**	9.0	7.0/7.1	DIN,ISO
				ER25-10GB	10.0	8.0	DIN,ISO
				ER25-11GB	11.0	9.0	DIN
				ER25-12GB	12.0	9.0	DIN
				ER25-14GB	14.0	11.0/12.0	DIN,ISO,JIS
				ER25-15GB	15.0	12.0	JIS
				ER25-16GB	16.0	12.0	DIN
ER32-**GB				ER40-**GB			
Type · Typ	Shank diameter Schaft Ø (mm)	Square head 4 Kant (mm)	Applicable standard NORM	Type · Typ	Shank diameter Schaft Ø (mm)	Square head 4 Kant (mm)	Applicable standard NORM
ER32-4GB	4.0	3.0	ISO,JIS	**ER40-6GB**	6.0	4.9	DIN
ER32-5GB	5.0	4.0	ISO,JIS	**ER40-7GB**	7.0	5.5	DIN,JIS
ER32-6GB	6.0	4.9	DIN	**ER40-8GB**	8.0	6.2/6.3	DIN,ISO
ER32-7GB	7.0	5.5	DIN,JIS	**ER40-9GB**	9.0	7.0/7.1	DIN,ISO
ER32-8GB	8.0	6.2/6.3	DIN,ISO	**ER40-10GB**	10.0	8.0	DIN,ISO
ER32-9GB	9.0	7.0/7.1	DIN,ISO	**ER40-11GB**	11.0	9.0	DIN
ER32-10GB	10.0	8.0	DIN,ISO	**ER40-12GB**	12.0	9.0	DIN
ER32-11GB	11.0	9.0	DIN	**ER40-14GB**	14.0	11.0/12.0	DIN,ISO,JIS
ER32-12GB	12.0	9.0	DIN	**ER40-15GB**	15.0	12.0	JIS
ER32-14GB	14.0	11.0/11.2	DIN,ISO,JIS	**ER40-16GB**	16.0	12.0	DIN
ER32-15GB	15.0	12.0	JIS	**ER40-17GB**	17.0	13.0	JIS
ER32-16GB	16.0	12.0	DIN	**ER40-18GB**	18.0	14.0/14.5	DIN,ISO
ER32-17GB	17.0	13.0	JIS	**ER40-20GB**	20.0	16.0	DIN,ISO
ER32-18GB	18.0	14.0/14.5	DIN,ISO				
ER32-20GB	20.0	16.0	DIN,ISO				

Note: please confirm the shank diameter and square head when ordering
Bemerkung: Bitte bei Bestellung den Schaftdurchmesser und die 4 Kant Mitnahme angeben.

All products on demand · Alle Produkte auf Anfrage

ZC**- Cylindrical collet for heavy duty milling
ZC**- Hochleistungs-Fräserspannfutterhülsen (zylindrisch)



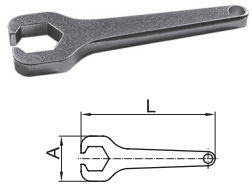
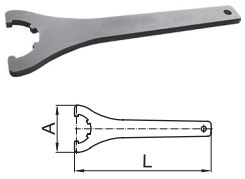


ZC20-**			
Clamping diameter ødm(mm) Spanndurch-messer	Type · Typ	Dimensions (mm) Abmessungen	
		ØD1	L
6	**ZC20-6**	20	52.5
8	**ZC20-8**	20	52.5
10	**ZC20-10**	20	52.5
12	**ZC20-12**	20	52.5
16	**ZC20-16**	20	52.5
20	Clamping directly		
25			
32			

ZC32-**			
Clamping diameter ødm(mm) Spanndurch-messer	Type · Typ	Dimensions (mm) Abmessungen	
		ØD1	L
6	**ZC32-6**	32	67.5
8	**ZC32-8**	32	67.5
10	**ZC32-10**	32	67.5
12	**ZC32-12**	32	67.5
16	**ZC32-16**	32	67.5
20	**ZC32-20**	32	67.5
25	**ZC32-25**	32	67.5
Clamping directly			

All products on demand · Alle Produkte auf Anfrage

Wrench for spring collet chuck
Schüssel für Feder Spannzangenaufnahme

Shape · Ausführung	Type · Typ	Dimensions(mm) · Abmessung	
		A	L
	**E11P**	32	95
	E16P	44	145
	**E25**	65	210
	E32	75	250
	E40	90	290

Wrench for arbor mill adapter
Schüssel für Aufsteckfräserdorne

Shape · Ausführung	Type · Typ	Locating shaft diameter · Zentrierschaftdurchmesser
	**FDS22**	22
	FDS27	27
	FDS32	32
	FDS40	40

Wrench for heavy duty milling collet chuck
Schüssel für Hochleistungs-Fräserspannfutter

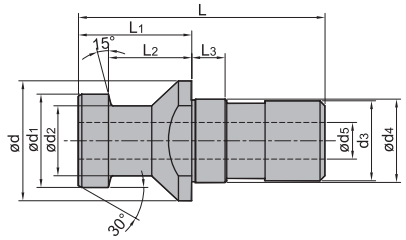
Shape · Abbildung	Type · Typ	Nut diameter Mutter Ø	L
	**WZC20-J**	55-60	253
	WZC32-J	80-90	272

All products on demand · Alle Produkte auf Anfrage

Pull studs DIN 69872 -metrical
Anzugsbolzen DIN 69872 -Metrisch



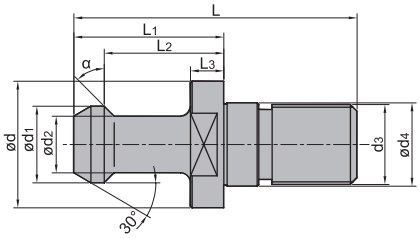
Internal coolant
Innenkühlung



Type Typ	Dimensions (mm) · Abmessungen										Weight Gewicht (kg)
	L	L1	L2	L3	d	d1	d2	d3	d4	d5	
JT40-A	54	26	20	7	23	19	14	M16	17	7	0.07
JT50-A	74	34	25	10	36	28	21	M24	25	11.5	0.2

Pull studs MAS 403-1975
Anzugsbolzen MAS 403-1975





Type Typ	Dimensions (mm) · Abmessungen										Weight Gewicht (kg)
	L	L1	L2	L3	d	d1	d2	d3	d4	α	
BT40-45°	60	35	28	6	23	15	10	M16	17	45°	0.06
BT40-60°	60	35	28	6	23	15	10	M16	17	60°	0.06
BT40-90°	60	35	28	6	23	15	10	M16	17	90°	0.06
BT50-45°	85	45	35	10	38	23	17	M24	25	45°	0.26
BT50-60°	85	45	35	10	38	23	17	M24	25	60°	0.26
BT50-90°	85	45	35	10	38	23	17	M24	25	90°	0.26

- Common products without coolant hole
- If need internal coolant product, please indicate it when ordering. Ordering guide: BT40-45oW
- Other type pull studs can be ordered by your requirement.

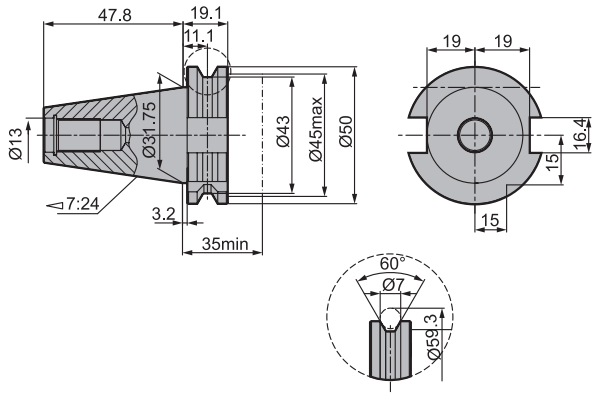
- Standard Anzugsbolzen, ohne Kühlmittelzuführung.
- Standard Anzugsbolzen, mit Kühlungszuführung. Bitte bei Bestellung angebenn: z.B. BT40-450W.
- Anzugsbolzen, können seperat als Sonderausführung hergestellt werden.

All products on demand · Alle Produkte auf Anfrage

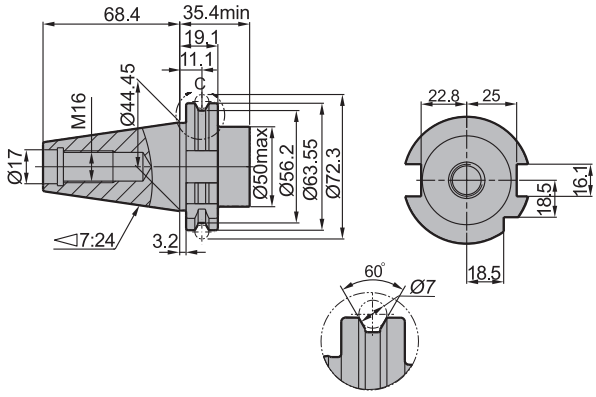
JT/BT Serie Holder · JT/BT Serie Aufnahme

DIN69871-A

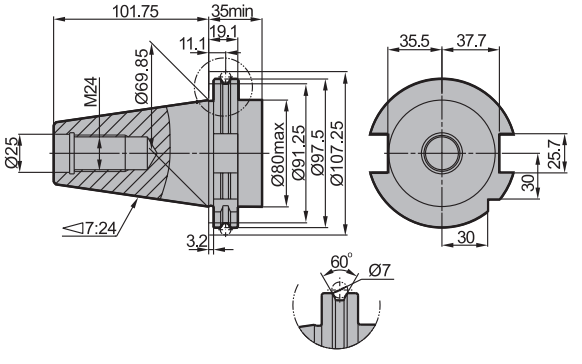
JT30



JT40

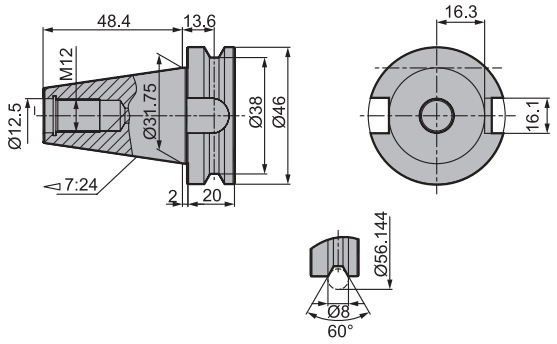


JT50

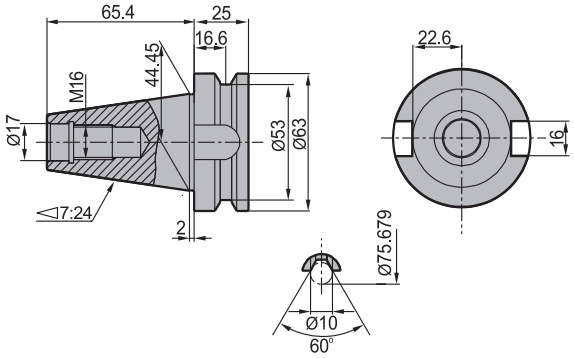


MAS403BT

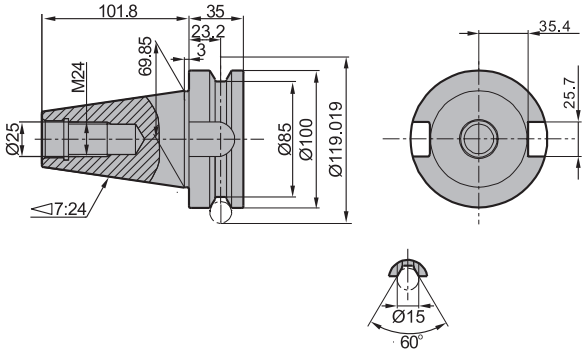
BT30



BT40



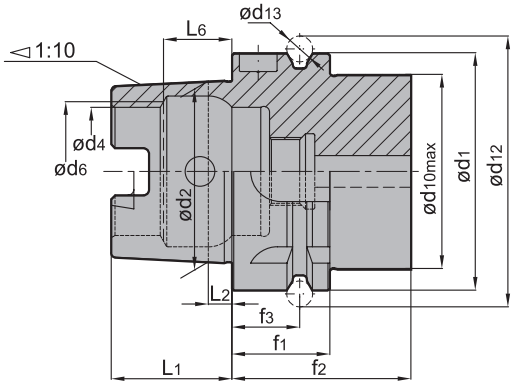
BT50

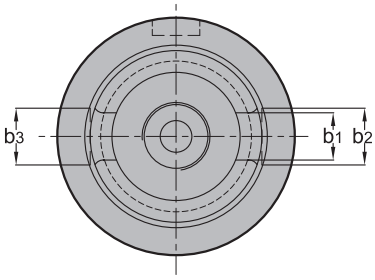


All products on demand · Alle Produkte auf Anfrage

HSK series Holder · HSK Serie Aufnahme

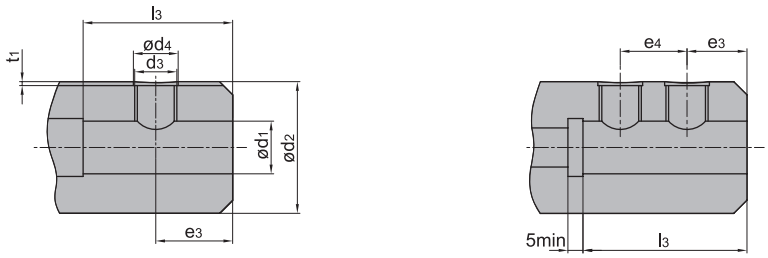
HSK short taper holder A type (DIN69893A)
HSK Aufnahmetyp (DIN 69893 A)





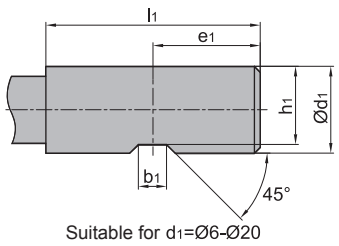
	b1	b2	b3	d1	d2	d4	d6	d10	d12	d13	f1	f2	f3	L1	L2	L6
HSK32	7.05	7	9	32	24	17	19	26	37	4	20	35	16	16	3.2	8.92
HSK40	8.05	9	11	40	30	21	23	34	45	4	20	35	16	20	4	11.42
HSK50	10.54	12	14	50	38	26	29	42	59.3	7	26	42	18	25	5	14.13
HSK63	12.54	16	18	63	48	34	37	53	72.3	7	26	42	18	32	6.3	18.13
HSK100	20.02	20	22	100	75	53	58	88	109.75	7	29	45	20	50	10	28.56

Weldon type chuck · Weldon Spannfutter

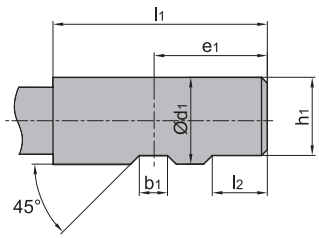


d_1(H5)	d_2(0-1)	d_3(6H)	d_4(min)	e_3(01)	e_4(±0.5)	l_3(±1)	t_1
6	25	M6	8	18.0	3.5	8.5	1.5
8	28	M8	10	17	4.5	10	2.5
10	35	M10	12	20	5.0	15	4.0
12	42	M12	14	20	6.0	20	5.0
14	44	M12	14	25	-	21	6.0
16	48	M14	16				
18	50	M14	16				
20	52	M16	18				
25	65	M18×2	20				
32	72	M20×2	22				

Weldon shank of tool · Weldonwerkzeugschaft



Suitable for d_1=Ø6-Ø20

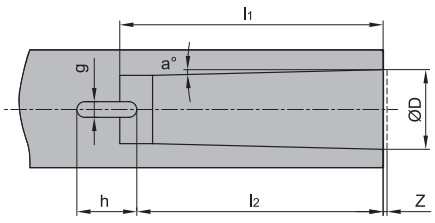


Suitable for d_1=Ø20-Ø63

d_1(h_6)	l_1($^{+2}_{0}$)	b_1($^{+0.05}_{0}$)	l_2($^{+1}_{0}$)	e_1($^{0}_{-1}$)	h_1(h_{11})
6	36	4.2	-	18.0	5.1
8	36	5.5	-	18.0	6.9
10	40	7.0	-	20.0	8.5
12	45	8.0	-	22.5	10.4
14	45	8.0	-	22.5	12.7
16	48	10.0	-	24.0	14.2
18	48	10.0	-	24.0	16.2
20	50	11.0	-	25.0	18.2
25	56	12.0	17	32.0	23.0
32	60	14.0	19	35.0	30.0

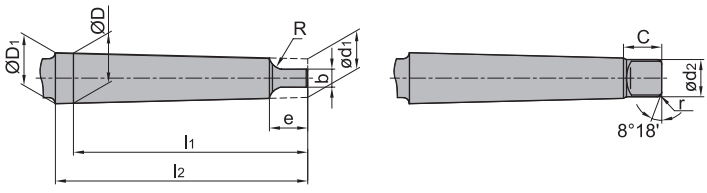
All products on demand · Alle Produkte auf Anfrage

Adapter for morse taper · Morsekegelaufnahmen



Taper angle Kegel-winkel	Taper angle Kegelwinkel		α°	ØD	l1(min)	l2	g	h	z	Corresponding drill diameter (mm) Bohrer Ø
MT1	1/20.047	0.04988	1°25'43"	12.065	56	52	5.4	19	1	3.00-14.00
MT2	1/20.047	0.04988	1°25'50"	17.780	67	62	6.6	22	1	14.00-23.00
MT3	1/20.047	0.04988	1°26'16"	23.825	84	78	8.2	27	1	23.00-32.00
MT4	1/20.047	0.04988	1°29'15"	31.267	107	98	12.2	32	1.5	32.00-50.00
MT5	1/20.047	0.04988	1°30'26"	44.399	135	125	16.2	38	1.5	50.00-75.00

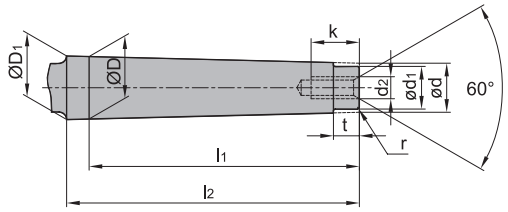
Shank morse taper with flattail · MK Schaft mit Austreiblappen



Taper angle Kegel-winkel	D	D1	d1	d2	l1	l2	b	c	e	R	r	Corresponding drill diameter (mm) Bohrer Ø
MT1	12.065	12.240	8.972	8.7	62.0	65.5	5.2	8.5	13.5	5	1.2	3.00-14.00
MT2	17.780	18.030	14.034	13.5	75.0	80.0	6.3	10.0	16.0	6	1.6	14.25-23.00
MT3	23.825	24.076	19.107	18.5	94.0	99.0	7.9	13.0	20.0	7	2	23.25-31.75
MT4	31.267	31.605	25.164	24.5	117.5	124.0	11.9	16.0	24.0	8	2.5	32.00-50.50
MT5	44.399	44.741	36.531	35.7	149.5	156.0	15.9	19.0	29.0	10	3	51.00-76.00

All products on demand · Alle Produkte auf Anfrage

Shank morse taper with flat tail · MK Schaft mit Austreiblappen

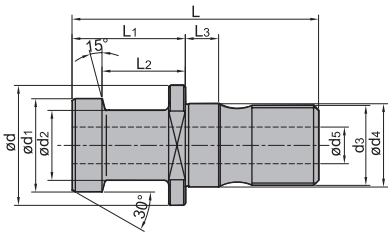


Taper angle Kegel-winkel	D	D1	d	d1	l1	l2	t	r	d2	K	Corresponding mill diameter (mm) Bohrer Ø
MT1	12.065	12.240	9.396	9	53.5	57	5	0.2	M6	16	6.00-12.00
MT2	17.780	18.030	14.583	14	64	69	5	0.2	M10	24	14.00-20.00
MT3	23.825	24.076	19.759	19	81	86	7	0.6	M12	28	22.00-36.00
MT4	31.267	31.605	25.943	25	102.5	109	9	1.0	M16	32	32.00-56.00
MT5	44.399	44.741	37.584	25.7	129.5	136	9	2.5	M20	40	40.00-71.00

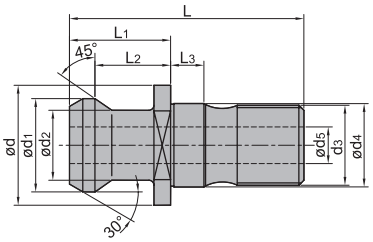
Pull stud · Anzugsbolzen

- ISO7388/2

A Type



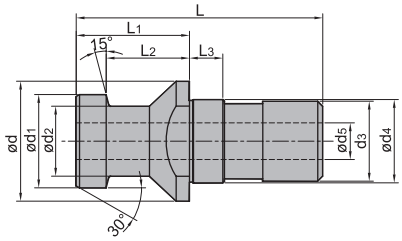
B Type



Dimensions · Abmessung (mm)										Weight (kg) Gewicht
L	L_1	L_2	L_3	d	d_1	d_2	d_3	d_4	d_5	
44	24	19	5	17	12	8	M12	13	-	0.05
54	26	20	7	23	19	14	M16	17	7.0	0.07
74	34	25	10	36	28	21	M24	25	11.5	0.22
27	11.8	8.1	5	17	13.3	9.3	M12	13	-	0.05
44.5	16.40	11.15	7	22.5	18.95	12.95	M16	17	7.0	0.07
65.5	25.55	17.95	10	36.0	29.10	19.60	M24	25	11.5	0.22

Pull stud · Anzugsbolzen

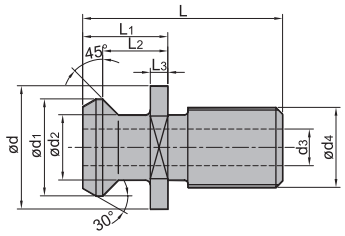
- DIN69872



Dimensions · Abmessung (mm)										Weight (kg) Gewicht
L	L_1	L_2	L_3	d	d_1	d_2	d_3	d_4	d_5	
44	24	19	5	17	13	9	M12	13	-	0.05
54	26	20	7	23	19	14	M16	17	7.0	0.07
74	34	25	10	36	28	21	M24	25	11.5	0.20

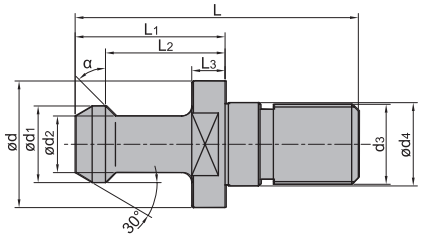
Pull stud · Anzugsbolzen

• USA standard ANSI B5.50 · USA Standard



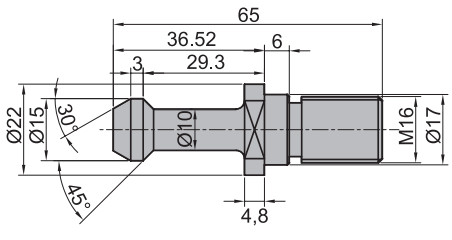
Dimensions · Abmessung (mm)									Weight (kg) Gewicht
L	L1	L2	L3	d	d1	d2	d3	d4	
29	11.80	8.15	2.75	16.5	13.55	9.30	M12	4.15	0.02
39	16.40	11.15	3.25	22.5	18.95	12.95	M16	7.35	0.07
60	25.55	17.95	5.25	37.0	29.10	19.60	M24	11.55	0.20

• Japan standard MAS403—1975 · Japan Standard



Dimensions · Abmessung (mm)										Weight (kg) Gewicht
L	L1	L2	L3	d	d1	d2	d3	d4	α	
43	23	18	5	16.5	11	7	M12	12.5	45°	0.03
43	23	18	5	16.5	11	7	M12	12.5	30°	0.03
60	35	28	6	23	15	10	M16	17	45°	0.06
60	35	28	6	23	15	10	M16	17	60°	0.06
85	45	35	10	38	23	17	M24	25	45°	0.20
85	45	35	10	38	23	17	M24	25	60°	0.20

• Special JDY40 · Spezial JDY40



All products on demand · Alle Produkte auf Anfrage

Threading pre-hole diameter · Kernlochdurchmesser

- Metric common thread
- Metrisch - Gewinde

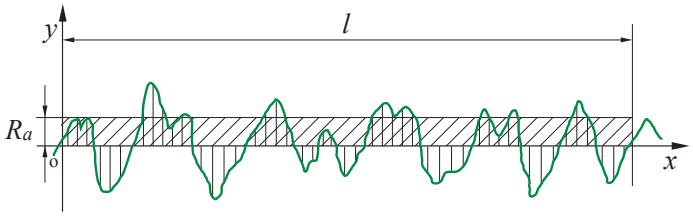
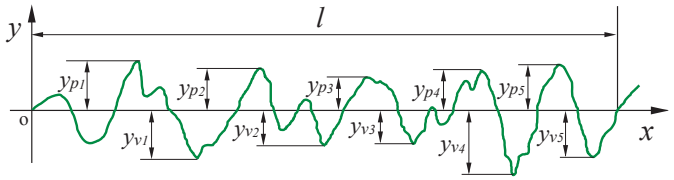
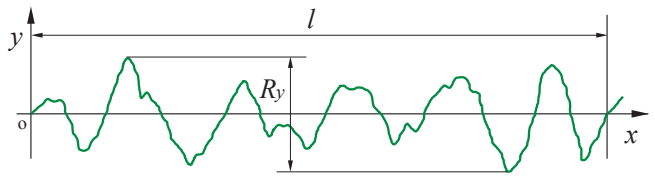
Thread code Gewindebez.	Pre-hole diameter (mm) Kerndurchmesser
M3×0.5	2.5
M3.5×0.6	2.9
M4×0.7	3.3
M5×0.8	4.2
M6×1.0	5.0
M7×1.0	6.0
M8×1.25	6.75
M9×1.25	7.75
M10×1.5	8.5
M11×1.5	9.5
M12×1.75	10.25
M14×2.0	12.0
M16×2.0	14.0
M18×2.5	15.5
M20×2.5	17.5
M24×3.0	21.0
M27×3.0	24.0
M30×3.5	26.5

- Metric fine screw fine
- Metrisch - Feingewinde

Thread code Gewindebez.	Pre-hole diameter (mm) Kerndurchmesser
M3×0.35	2.65
M3.5×0.35	3.15
M4×0.5	3.5
M4.5×0.5	4.0
M5×0.5	4.5
M5.5×0.5	5.0
M6×0.75	5.25
M7×0.75	6.25
M8×1.0	7.0
M8×0.75	7.25
M9×1.0	8.0
M9×0.75	8.25
M10×1.25	8.75
M10×1.0	9.0
M10×0.75	9.25
M11×1.0	10.0
M11×0.75	10.25
M12×1.5	10.5
M12×1.25	10.75
M12×1.0	11.0

Thread code Gewindebez.	Pre-hole diameter (mm) Kerndurchmesser
M14×1.5	12.5
M14×1.0	13.0
M15×1.5	13.5
M15×1.0	14.0
M16×1.5	14.5
M16×1.0	15.0
M17×1.5	15.5
M17×1.0	16.0
M18×2.0	16.0
M18×1.5	16.5
M18×1.0	17.0
M20×2.0	18.0
M20×1.5	18.5
M20×1.0	19.0
M22×2.0	20.0
M22×1.5	20.5
M22×1.0	21.0
M24×2.0	22.0
M24×1.5	22.5
M24×1.0	23.0

Surface roughness · Oberflächenrauhigkeit

Type	Code	Calculation method · Berechnungsmethode	Calculation example (figure) · Meßaufnahme (Abb.)
Arithmetic average deviation of profile Mittlere Rauhtiefe	Ra	Within sampling length l, the arithmetic average absolute value of profile deviation is $$Ra = \frac{1}{l}\int_0^l |y(x)|dx$$ In the formula, the profile deviation y is the distance between profile points and reference line in the measuring direction. Reference line is the profile least-square average line O. This line divide the profile and make the sum of squares of profile deviation to be the minimum within the sampling length. Der Mittelrauhwert Ra ist der arithmetische Mittelwert der absoluten Beträge der Abstände y des Rauhheitsprofils von der Mittellinie innerhalb der Messstrecke. Dies ist gleichbedeutetend mit der Höhe des Rechtecks, dessen Länge gleich der Gesamtstrecke l ist und das flächengleich mit der Summe der zwischen dem Rauheitsprofil und der Mittellinie eingeschlossenen Fläche ist y=f	
Irregularity ten-point high Gemittelte Rauhtiefe	Rz	Within sampling length l, the sum of the average value of heights of five highest profile peak and the depths of five deepest profile valleys $$Rz = \frac{\sum_{i=1}^{5} yp_i + \sum_{i=1}^{5} yv_i}{5}$$ In the formula, ypi means the height of 'i'th highest profile peak. In the formula, yvi means the depth of 'i'th deepest profile valley. Maximum height of profile Ry: the distance between the top profile peak line and the bottom profile valley line in the longitudinal direction within the sampling length l. Die gemittelte Rauhtiefe Rz ist das arithmetische Mittel aus den Einzelrauhtiefen fünf aufeinander grenzender Einzelmessstrecken gleicher Länge. Rz wird ebenfalls in (µm) angegeben.	
Maximum height of profile Maximale Rauhtiefe	Ry	The distance between the inner profile peak line and the bottom profile valley line in the longitudinal direction within the sampling length l. Top profile peak line is the line that parallels to the reference line and passes through the highest point of profile peak. Bottom profile line is the line that parallels to the reference line and passes through the lowest point of profile valley. Die maximale Rauhtiefe Ry ist die größte der auf der Gesamtmeßstrecke l vorkommenden Einzelrauhtiefen, Ry wird auch in (µm) Mikrometer angegeben. (Bemerkung) Um Rz herausfinden, wird ein Anteil ohne außergewöhnliche Höhen und Tiefen als Stichprobenlänge ausgewählt und als Schwachstelle betrachtet.	

Material comparison table · Werkstoffe Vergleichstabelle

ISO	Country and Standard · Standardbezeichnung nach Länder										
	China	USA	Germany		Great Britain		Sweden	France	Italy	Spain	Japan
	GB	AISI/SAE	W.-nr	DIN	BS	EN	SS	AFNOR	UNI	UNE	JIS
P	Alloy steel · leg. Stahl										
	15	1015	1.0401	C15	080M15	-	1350	CC12	C15C16	F.111	-
	20	1020	1.0402	C22	050A20	2C	1450	CC20	C20C21	F.112	-
	35	1035	1.0501	C35	060A35	-	1550	CC35	C35	F.113	-
	45	1045	1.0503	C45	080M40	-	1650	CC45	C45	F.114	-
	55	1055	1.0535	C55	070M55	-	1655	-	C55	-	-
	60	1060	1.0601	C60	080A62	43D	-	CC55	C60	-	-
	Y15	1213	1.7015	9SMn28	230M07	-	1912	S250	CF9SMn28	11SMn28	SUM22
	-	12L13	1.0718	9SMnPb28	-	-	1914	S250Pb	CF9MnPb28	11SMnPb28	SUM22L
	-	-	1.0722	10SPb20	-	-	-	10PbF2	CF10Pb20	10SPb20	-
	-	1140	1.0726	35S20	212M36	8M	1957	35MF4	-	F210G	-
	Y13	1215	1.0736	9SMn36	240M07	1B	-	S300	CF9SMn36	12SMn35	-
	-	12L14	1.0737	9SMnPb36	-	-	1926	S300Pb	CF9SMnPb36	12SMnP35	-
	55Si2Mn	9255	1.0904	55Si9	250A53	45	2085	55S7	55Si8	56Si7	-
	-	9262	1.0961	60SiCr7	-	-	-	60SC7	60SiCr8	60SiCr8	-
	15	1015	1.1141	Ck15	080M15	32C	1370	XC12	C16	C15K	S15C
	40Mn	1039	1.1157	40Mn4	150M36	15	-	35M5	-	-	-
	25	1025	1.1158	Ck25	-	-	-	-	-	-	S25C
	35Mn2	1335	1.1167	36Mn5	-	-	2120	40Mn5	-	36Mn5	SMn438(H)
	30Mn	1330	1.1170	28Mn6	150M28	14A	-	20M5	C28Mn	-	SCMn1
	35Mn	1035	1.1183	Cf35	060A35	-	1572	XS38TS	C36	-	S35C
	Ck45	1045	1.1191	45	080M46	-	1672	XC42	C45	C45K	S45C
	55	1055	1.1203	Ck55	070M55	-	-	XC45	C50	C55K	S55C
	50	1050	1.1213	Cf53	060A52	-	1674	XC48TS	C53	-	S50C
	60Mn	1060	1.1221	Ck60	080A62	43D	1678	XC60	C60	-	S58C
	-	1095	1.1274	Ck101	060A96	-	1870	-	-	-	SUP4
	-	-	1.3401	X120Mn12	Z120M12	-	-	X120M12	XG120Mn12	X120Mn12	SCMnH/1
	Gr15;45Gr	52100	1.3505	100Cr6	534A99	31	2258	100C6	100Cr6	F.131	SUJ2
	-	ASTM A204Gr.A	1.5415	15Mo3	1501-240	-	2912	15D3	16Mo3KW	16Mo3	-
	-	4520	1.5426	16Mo5	1503-245-420	-	-	-	16Mo5	16Mo5	-
	-	ASTM A350LF5	1.5622	14Ni6	-	-	-	16N6	14Ni6	15Ni6	-
	-	ASTM A353	1.5662	X8Ni9	1501-509;510	-	-	-	X10Ni9	XBNi09	-

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	GB	AISI/SAE	W.-nr	DIN	BS	EN	SS	AFNOR	UNI	UNE	JIS
P	Alloy steel · leg. Stahl										
	-	2515	1.5680	12Ni19	-	-	-	Z18N5	-	-	-
	-	3135	1.5710	36NiCr6	640A35	111A	-	35NC6	-	-	SNC236
	-	3415	1.5732	14NiCr10	-	-	-	14NC11	16NiCr11	15NiCr11	SNC415(H)
	-	3415 3310	1.5752	14NiCr14	655M13 655A12	36A	-	12NC15	-	-	SNC815(H)
	-	9840	1.6511	36CrNiMo4	816M40	110	-	40NCD3	38CrNiMo4(KB)	35CrNiMo4	-
	-	8620	1.6523	21NiCrMo2	850M20	362	2503	20NCD2	20NiCrMo2	20NiCrMo2	SNCCM220(H)
	-	8740	1.6546	40NiCrMo2	311-Type7	-	-	-	40NiCrMo2(KB)	40NiCrMo2	SNC240
	40CrNiMoA	4340	1.6582	34CrNiMo6	817M40	24	2541	35NCD6	35CrNiMo6(KB)	-	-
	-	-	1.6587	17CrNiMo6	820A16	-	-	18NCD6	-	14CrNiMo13	-
	15Cr	5015	1.7015	15Cr3	523M15	-	-	12C3	-	-	SCr415(H)
	35Cr	5132	1.7033	34Cr4	530A32	18B	-	32C4	34Cr4(KB)	35Cr4	SCr430(H)
	40Cr	5140	1.7035	41Cr4	530M40	18	-	42C4	41Cr4	42Cr4	SCr440(H)
	40Cr	5140	1.7045	42Cr4	-	-	2245	-	-	42Cr4	SCr440
	18CrMn	5115	1.7131	16MnCr15	(527M20)	-	2511	16MC5	16MnCr15	16MnCr15	-
	20CrMn	5155	1.7176	55Cr3	527A60	48	-	55C3	-	-	SUP9(A)
	30CrMn	4130	1.7218	25CrMo4	1717CDS110	-	2225	25CD4	25CrMo4(KB)	55Cr3	SCM420; SCM430
	35CrMo	4137;4135	1.7220	34CrMo4	708A37	19B	2234	35CD4	35CrMo4	34CrMo4	SCM432; SCRRM3
	40CrMoA	4140;4142	1.7223	41CrMo4	708M40	19A	2244	42CD4TS	41CrMo4	41CrMo4	SCM440
	42CrMo 42CrMnMo	4140	1.7225	42CrMo4	708M40	19A	2244	42CD4	42CrMo4	42CrMo4	SCM440(H)
	-	-	1.7262	15CrMo5	-	-	2216	12CD4	-	12CrMo4	SCM415(H)
	-	ASTM A182 F11;F12	1.7335	13CrMo44	1501- 620Gr.27	-	-	15CD3.5; 15CD4.5	14CrMo44	14CrMo45	-
	-	-	1.7361	32CrMo12	722M24	40B	2240	30CD12	32CrMo12	F.124.A	-
	-	ASTM A182 F.22	1.7380	10CrMo910	1501- 622Gr.31;45	-	2218	12CD9;10	12CrMo9,10	TU.H	-
	-	-	1.7715	14MoV63	1503-660-440	-	-	-	-	13MoCrV6	-
	50CrVA	6150	1.8159	50CrV4	735A50	47	2230	50CV4	50CrV4	51CrV4	SUP10
	-	-	1.8509	41CrAlMo7	905M39	41B	2940	40CAD6,12	41CrAlMo7	41CrAlMo7	-
	-	-	1.8523	39CrMoV139	897M39	40C	-	-	36CrMoV12	-	-

Material comparison table · Werkstoffe Vergleichstabelle

ISO	Country and Standard · Standardbezeichnung nach Länder										
	China	USA	Germany		Great Britain		Sweden	France	Italy	Spain	Japan
	GB	AISI/ SAE	W.-nr	DIN	BS	EN	SS	AFNOR	UNI	UNE	JIS
P	Tool steel · Werkzeugstahl										
	T10	W.110	1.1545	C105W1	-	-	1880	$Y_1$105	C98KU C100KU	F.515 F.516	-
	T12A	W.112	1.1663	C125W	-	-	-	$Y_2$120	C120KU	(C120)	SK2
	CrV;9SiCr	L3	1.2067	100Cr6	BL3	-	-	Y100C6	-	100Cr6	-
	Cr12	D3	1.2080	X210Cr12	BD3	-	-	Z200Cr12	X210Cr13KU X250Cr12KU	X210Cr12	SKD1
	4Cr5MoVSi	H13	1.2344	X40CrMoV5 1	BH13	-	2242	Z40CDV5	X35CrMoV05KU X40CrMoV51KU	X40CrMoV5	SKD61
	Cr6WV	A2	1.2363	X100CrMoV5 1	BA2	-	2260	Z100CDV5	X100CrMoV51KU	X100CrMoV5	SKD12
	CrWMo	-	1.2419	105WCr6	-	-	2140	105WC13	10WCr6 107WCr5KU	105WCr5	SKS31 SKS2 SKS3
	Cr12W	-	1.2436	X210CrW12	-	-	2312	-	X215CrW12 1KU	X210CrW12	SKD2
	5CrNiMo	S1	1.2542	45WCrV7	BS1	-	2710	-	45WCrV8KU	45WCrSi8	-
	3Cr2W8V	H21	1.2581	X30WCrV9 3 X30WCrV93KU	BH21	-	-	Z30WCV9	X28W09KU X30WCrV9 3KU	X30WCrV9	SKD5
	Cr12MoV	-	1.2601	X165CrMoV 12	-	-	2310	-	X165CrMoW12KU	X160CrMoV12	SKD11
	5CrNiMo	L6	1.2713	55NiCrMoV6	-	-	-	55NCDV7	-	F.250.S	SKT4
	V	W210	1.2833	100V1	BW2	-	-	$Y_1$105V	-	-	SKS43
	W6Mo5Cr4V2Co5	-	1.3243	S6-5-2-5	-	-	2723	Z85WDKCV	HS6-5-2-5	HS6-5-2-5	SKH55
	W18Cr4VCo5	T4	1.3255	S18-1-2-5	BT4	-	-	Z80WKCV 10-05-04-01	X78WCo1805KU	HS18-1-1-5	SKH3
	W6Mo5Cr4V2	M2	1.3343	S6-5-2	BM2	-	2722	Z85WDCV 06-05-04-02	X82WMo0605KU	HS6-5-2	SKH9
	-	M7	1.3348	S2-9-2	-	-Z-	2782	Z100WCWV 09-02-04-02	HS2-9-2	HS2-9-2	-
	W18Cr4V	T1	1.3355	S18-0-1	BT1	-	-	Z80WCV 18-04-01	X75W18KU	HS18-0-1	SKH2
	W6Mo5Cr4V3	M3	-	S6-5-3	-	-	-	-	-	-	SKH52
	-	M42	-	-	BM42	-	-	-	-	-	SKH59

ISO	Country and Standard · Standardbezeichnung nach Länder					Main application Hauptanwendung
	China	USA	Germany	Japan	Daido Steel Co., Ltd (Japan)	
	GB	AISI/SAE	DIN	JIS	DAIDO	
P	Plastic die steel · Gesenkstahl					
	-	P20 mod.		-	PX5N	For mass production of large mirror dies. Automobile tail light, front fender of car, video camera, household electrical appliances etc Große hochglänzende Präzisions Gesenke für die Serienproduktion. Automobilteile, Videokameras, elektr. Haushaltsgeräte ect.
	-	-		-	NAK55	High precision mirror die. Video camera, music disc, Cosmetic Containers, transparent covers, transparent films etc Hochglänzende Präzisions Gesenke für Videokameras, Musik CDs, Kosmetik Behälter, Transparente Abdeckungen.
	-	-		-	NAK80	High precision mirror die. Video camera, music disc, Cosmetic Containers, transparent covers, transparent films etc Hochglänzende Präzisions Gesenke für Videokameras, Musik CDs, Kosmetik Behälter, Transparente Abdeckungen und Beläge.
	3Cr13	420 mod.		SUS420J2 mod.	S-STAR	For ultra-mirror corrosion resistant precise dies. Accessories of camera, CD, lens, watch case. Für ultra fein spiegelnde Korrosionsbeständige Gesenke für Zubehör von Kameras. CD, Linsen, Armbanduhren.
	Cold-working die steel · Kaltarbeitsstahl					
	-	02	-	SKS93	YK30	Stamping die, gauge calipers, paper cutter, auxiliary tools Für Gesenkstempel, Meßkaliber, Papierschneidmesser, Werkzeuge
	9CrWMn	01 mod.	-	SKS3 mod.	GOA	Blanking die, gauge calipers, drawing die, taps, Perforated punch. Für Schnittmatritzen, Meßkaliber, Gewindebohrer, Perforationswerkzeuge, Kaltziehsteine
	Cr12MoV	D2	X165CrMoV12	SKD11	DC11	Blanking die, cold forming die, cold drawing die, forming roller, punch Für Schnittmatritzen, Kaltformpreßgesenke, Kaltziehsteine, Formwalzen.
	-	D2 mod.	-	SKD11 mod.	DC53	Blanking die, cold forming die, cold drawing die, forming roll, punch Für Schnittmatritzen, Kaltformpreßgesenke, Kaltziehsteine, Formwalzen.
	Hot-working die steel · Warmarbeitsstahl					
	4Cr5MoSiV1	H13	X40CrMoV51	SKD61	DHA1	Aluminum compression die, connecting parts of compression die, hot stamping die, hot extrusion die, thermal shear cutting blade Aluminium Druckgesenke, Verbindungsstücke für Druckgesenke, Heißpressgesenke, Heiß Extruder Gesenke, warmfeste Schnittmesser ect.
	-	-	-	-	DH21	Long life Aluminum compression die Alu Druckgesenke für lange Lebensdauer
	-	-	-	-	DH31-S	Compression die, Druckgesenke
	-	-	-	-	DH2F	Compression die, plastic die Druckgesenke, Plastik Gesenk

ISO	Country and Standard · Standardbezeichnung nach Länder										
	China	USA	Germany		Great Britain		Sweden	France	Italy	Spain	Japan
	GB	AISI/ SAE	W.-nr	DIN	BS	EN	SS	AFNOR	UNI	UNE	JIS
M	Stainless steel · Rostfreier Stahl										
	0Cr13; 1Cr12	403	1.4000	X6Cr13	403S17	-	2301	Z6C13	X6Cr13	F.3110	SUS403
	-	-	1.4001	X7Cr14	-	-	-	-	-	F.8401	-
	1Cr13	410	1.4006	X10Cr13	410S21	56A	2302	Z10C14	X12Cr13	F.3401	SUS410
	1Cr17	430	1.4016	X6Cr17	430S15	60	220	Z8C17	X8Cr17	F.3113	SUS430
	2Cr13	410	1.4021	X20Cr13	S62	56B; 56C	-	Z20C13	X20C13	F.3401	SUS410
	-	-	1.4027	G-X20Cr14	420C29	56B	-	Z20C13M	-	-	SCS2
	4Cr13	-	1.4034	X46Cr13	420S45	56D	2304	Z40CM Z38C13M	X40Cr14	F.3405	SUS420J2
	1Cr17Ni2	431	1.4057	X20CrNi172	431S29	57	2321	Z15CNi6.02	X16CNi16	F.3427	SUS431
	Y1Cr17	430F	1.4104	X12CrMoS17	-	-	2383	Z10CF17	X10CrS17	F.3117	SUS430F
	1Cr17Mo	434	1.4113	X6CrMo171	434S17	-	2325	Z8CD17.01	X8CrMo17	-	SUS434
	-	-	1.4313	X5CrNi134	425C11	-	-	Z4CND13.4M	-	-	SCS5
	-	-	1.4408	G-X6CrNiMo1810	316C16	-	-	-	-	F.8414	SCS14
	4Cr9Si2	HW3	1.4718	X45CrSi93	401S45	52	-	Z45CS9	X45CrSi8	F.322	SUH1
	0Cr13Al	405	1.4724	X10CrAl13	403S17	-	-	Z10C13	X10CrAl12	F.311	SUS405
	Cr17	430	1.4742	X10CrAl18	430S15	60	-	Z10CAS18	X8Cr17	F.3113	SUS430
	8Cr20Si2Ni	HNV6	1.4757	X80CrNiSi20	443S65	59	-	Z80CSN20.02	X80CrSiNi20	F.320V	SUH4
	2Cr25N	446	1.4762	X10CrAl24	-	-	2322	Z10CAS24	X16Cr26	-	SUH446
	Austenitic stainless steel · Austenitischer Rostfreier Stahl										
	0Cr18Ni9	304	1.4301	X5CrNi1810	304S15	58E	2332	Z6CN18.09	X5CrNi1810	F.3551; F.3541; F.3504	SUS304
	1Cr18Ni9MoZr	303	1.4305	X10CrNiS189	303S21	58M	2346	Z10CNF18.09	X10CrNiS18.09	F.3508	SUS303
	0Cr19Ni10	304L	1.4306	X2CrNi1911	304S12	-	2352	Z2CN18.10	X2CrNi18.11	F.3503	SCS19
	-	-	1.4308	G-X6CrNi189	304C15	-	-	Z6CN18.10M	-	-	SCS13
	Cr17Ni7	301	1.4310	X12CrNi177	-	-	2331	Z12CN17.07	X12CrNi1707	F.3517	SUS301
	-	304LN	1.4311	X2CrNiN1810	304S62	-	2371	Z2CN18.10	-	-	SUS304LN
	0Cr19Ni9	304	1.4350	X5CrNi189	304S31	58E	-	Z6CN18.09	X5CrNi1810	-	SUS304
	0Cr17Ni11Mo2	316	1.4401	X5CrNiMo1712	316S16	Z6CND17.11	2347	1.4401	X5CrNiMo1712	F.3543	SUS316
	00Cr17Ni13Mo2	316LN	1.4429	X2CrNiMoN17133	-	-	2375	Z2CND17.13	-	-	SUS316LN
	0Cr27Ni12Mo3	316L	1.4435	X2CrNiMo18143	316S12	-	2353	Z2CDN17.13	X2CrNiMo1713	-	SCS16,
	00Cr19Ni13Mo3	317L	1.4438	X2CrNiMo17133	317S12	-	2367	Z2CND19.15	X2CrNiMo18.16	-	SUS317L
	-	329L	1.4460	X8CrNiMo275	-	-	2324	-	-	-	SUS329L; SCH11; SCS11
	1Cr18Ni9Ti	321	1.4541	X6CrNiTi1810	2337	321S12	58B	Z6CNT18.10	X6CrNiTi1811	F.3553	SUS321
	1Cr18Ni11Nb	347	1.4550	X6CrNiNb1810	347S17	58F	2338	Z6CNNb18.1	X6CrNiTi1811	F.3552	SUS347
	Cr18Ni12Mo2Ti	316Ti	1.4571	X6CrNiMoTi17122	320S17	58J	2350	Z6NDT17.12	X6CrNiMoTi17	F.3535	-

ISO	Country and Standard · Standardbezeichnung nach Länder									
	China	USA	Germany		Great Britain		Sweden	France	Italy	Spain	Japan
	GB	AISI/ SAE	W.-nr	DIN	BS	EN	SS	AFNOR	UNI	UNE	JIS
	Austenitic stainless steel · Austenitischer Rostfreier Stahl										
	-	-	1.4581	G-X5CrNiMoNb1810	318C7	-	-	Z4CNDNb1812M	XG8CrNiMo18	-	SCS22
	Cr17Ni12Mo3Nb	318	1.4583	X10CrNiMoNb1812	-	-	-	Z6CNDNb1713B	X6CrNiMoTiNb17	-	-
	1Cr23Ni13	309	1.4828	X15CrNiSi2012	309S24	-	-	Z15CNS20.1	-	-	SUH309
	0Cr25Ni20	310S	1.4845	X12CrNi2521	310S24	-	2361	Z12CN2520	X6CrNi2520	F.331	SUH310
	Cr15Ni36W3Ti	330	1.4864	X12NiCrSi3616	-	-	-	Z12CNS35.1	-	-	SUH330
	-	-	1.4865	G-X40NiCrSi3818	330C11	-	-	-	XG50NiCr3919	-	SCH15
	5Cr2Mn9Ni4N	EV8	1.4871	X53CrMnNiN219	349S54; 321S12	- 58B	-	Z52CMN21.0	X53CrMnNiN219	-	SUH35
	1Cr18Ni9Ti	321	1.4878	X12CrNiTi189	321S320	58C	-	Z6CNT18.12	X6CrNiTi1811	F.3523	SU321

ISO	Country and Standard · Standardbezeichnung nach Länder								
	China	USA	Germany	Great Britain	Sweden	France	Italy	Spain	Japan
K	Nodular cast iron · GGG								
	QT400-18	60-40-18	GGG40	400/17	0717-02	FGS370-17	GS370-17	FGE38-17	FCD400
	QT450-10	65-45-12	--	420/12	--	FGS400-12	GS400-12	FGE42-12	FCD450
	QT500-7	70-50-05	GGG50	500/7	0727-02	FGS500-7	GS500-7	FGE50-7	FCD500
	QT600-3	80-60-03	GGG60	600/7	0732-03	FGS600-2	GS600-2	FGE60-2	FCD600
	QT700-2	100-70-03	GGG70	700/2	0737-01	FGS700-2	GS700-2	FGE70-2	FCD700
	QT800-2	120-90-02	GGG80	800/2	0864-03	FGS800-2	GS800-2	FGE80-2	FCD800
	QT900-2	--	--	900/2	--	--	--	--	--
	Grey cast iron · Grauguss								
	--	NO.60	GG40	--	0140	FGL400	--	--	
	HT350	NO.50	GG35	350	0135	FGL350	G35	FG35	FC350
	HT300	NO.45	GG30	300	0130	FGL300	G30	FG30	FC300
	HT250	NO.35	GG25	250	0125	FGL250	G25	FG25	FC250
	HT200	NO.30	GG20	200	0120	FGL200	G20	FG20	FC200
	HT150	NO.20	GG15	150	0115	FGL150	G15	FG15	FC150
	HT100	--	--	100	0110	--	G10	--	FC100

Fitting dimension tolerance · Passtoleranzen

Basic dimensions (mm)		Standard tolerance class of holes · Standard Toleranz Klassen																	
		IT1	IT2	IT3	IT4	IT5	IT6	IT7	IT8	IT9	IT10	IT11	IT12	IT13	IT14	IT15	IT16	IT17	IT18
>	≤	μm											mm						
---	3	0.8	1.2	2	3	4	6	10	14	25	40	60	0.1	0.14	0.25	0.4	0.6	1	1.4
3	6	1	1.5	2.5	4	5	8	12	18	30	48	75	0.12	0.18	0.3	0.48	0.75	1.2	1.8
6	10	1	1.5	2.5	4	6	9	15	22	36	58	90	0.15	0.22	0.36	0.58	0.9	1.5	2.2
10	18	1.2	2	3	5	8	11	18	27	43	70	110	0.18	0.27	0.43	0.7	1.1	1.8	2.7
18	30	1.5	2.5	4	6	9	13	21	33	52	84	130	0.21	0.33	0.52	0.84	1.3	2.1	3.3
30	50	1.5	2.5	4	7	11	16	25	39	62	100	160	0.25	0.39	0.62	1	1.6	2.5	3.9
50	80	2	3	5	8	13	19	30	46	74	120	190	0.3	0.46	0.74	1.2	1.9	3.	4.6
80	120	2.5	4	6	10	15	22	35	54	87	140	220	0.35	0.54	0.87	1.4	2.2	3.5	5.4
120	180	3.5	5	8	12	18	25	40	63	100	160	250	0.4	0.63	1	1.6	2.5	4	6.3
180	250	4.5	7	10	14	20	29	46	72	115	185	290	0.46	0.72	1.15	1.85	2.9	4.6	7.2
250	315	6	8	12	16	23	32	52	81	130	210	320	0.52	0.81	1.3	2.1	3.2	5.2	8.1
315	400	7	9	13	18	25	36	57	89	140	230	360	0.57	0.89	1.4	2.3	3.6	5.7	8.9
400	500	8	10	15	20	27	40	63	97	155	250	400	0.63	0.97	1.55	2.5	4	6.3	9.7
500	630	9	11	16	22	32	44	70	110	175	280	440	0.7	1.1	1.75	2.8	4.4	7	11
630	800	10	13	18	25	36	50	80	125	200	320	500	0.8	1.25	2	3.2	5	8	12.5
800	1000	11	15	21	28	40	56	90	140	230	360	560	0.9	1.4	2.3	3.6	5.6	9	14
1000	1250	13	18	24	33	47	66	105	165	260	420	660	1.05	1.65	2.6	4.2	6.6	10.5	16.5
1250	1600	15	21	29	39	55	78	125	195	310	500	780	1.25	1.95	3.1	5	7.8	12.5	19.5
1600	2000	18	25	35	46	65	92	150	230	370	600	920	1.5	2.3	3.7	6	9.2	15	23
2000	2500	22	30	41	55	78	110	175	280	440	700	1100	1.75	2.8	4.4	7	11	17.5	28
2500	3150	26	36	50	68	96	135	210	330	540	860	1350	2.1	3.3	5.4	8.6	13.5	21	33

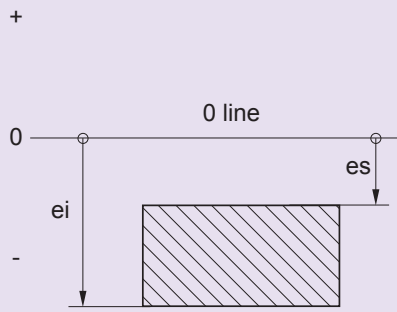
Note:
From IT1 to IT5, the standard tolerance with basic dimension more than 500 mm is as trial.
When the basic dimension 1 mm, the tolerances from IT4 to IT8 are invalid.

Bemerkung: Für die Standart Toleranzen IT1 bis IT5 bei Durchmesser über 500mm ist eine Anpassung notwendig. Bei Basis Abmessungen unter 1mm ist das Toleranzfeld IT4 bis IT8 ungültig.

The shaft lower deviation(ei) and upper deviation (es) can be obtained by basic tolerance and standard tolerance (IT) of shaft.

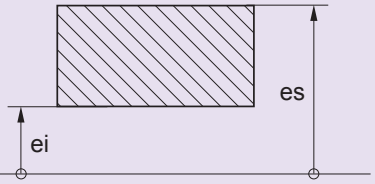
Toleranz Einheitswelle: Die geringste Abweichung (ei) und die größte Abweichung (es) sind als Basis bzw. Standorttoleranzen (IT) in der Tabelle angegeben.

Deviation from a to h
Abweichung von a bis h



ES= negative (-) basic tolerance of hole
ES= neg(-) Basistoleranz der Bohrung
ei=es-IT

Deviation from k to zc
Abweichung von k bis zc

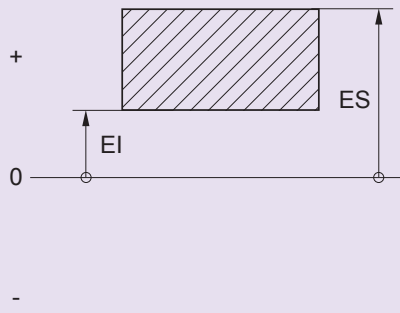


EI= positive (+) basic tolerance of hole
EI= pos(+) Basistoleranz der Bohrung
es=ei+IT

The hole lower deviation(EI) and upper deviation (ES) can be obtained by basic tolerance and standard tolerance (IT) of hole.

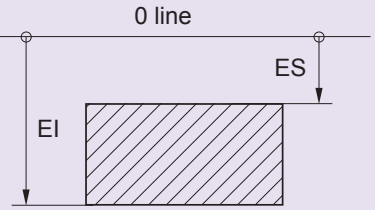
Toleranz Einheitsbohrung: Die geringste Abweichung (EI) und die größte Abweichung (ES) sind als Basis bzw. Standarttoleranzen (IT)- Bohrung in der Tabelle angegeben.

Deviation from a to h
Abweichung von A bis H



EI= postive (+) basic tolerance of hole
EI= pos(+ Basistoleranz der Bohrung
ES=EI+IT

Deviation from K to ZC
(It is not applicable for K, M with the tolerance < IT8)
Abweichung von K von ZC
(Ist nicht anwendbar für K, M mit der >Toleranz < IT8)



ES=negitive (-) basic tolerance of hole
ES= neg(-) Basistoleranz der Bohrung
EI=ES+IT

For example: for a hole with diameter 3 mm and tolerance H7, we can find that the lower deviation EI=0 in relation to H7 from the basic tolerance table, and the standard tolerance IT=10μm corresponding to H7, thus the upper deviation ES=EI+IT=10μm. Therefore the hole fitting dimension is Ø 3mm = $^{+0.01}_{0}$ mm.

Beispiel: Bei einem Durchmesser von 3mm und einer Toleranz H7 ist bei der Basis Toleranz H7 (EI=0) bei der Standorttoleranz H7 ist es IT=10μm. Die größte Abweichung ist demzufolge: ES=EI+IT=10μm

Die Bohrungstoleranz ist bei einem Ø 3mm = $^{+0.01}_{0}$ mm.

- **Basic deviations value of shaft**
- **Basistoleranzwerte Einheitswelle**

Diameter Durchmesser Ø (mm)		Basic deviation value · Basistoleranzwerte											
		Upper deviation es · Höchstabweichung											
		Standard tolerance class · Standardtoleranzklasse											
>	≤	a	b	c	cd	d	e	ef	f	fg	g	h	js
---	3	-270	-140	-60	-34	-20	-14	-10	-6	-4	-2	0	
3	6	-270	-140	-70	-46	-30	-20	-14	-10	-6	-4	0	
6	10	-280	-150	-80	-56	-40	-25	-18	-13	-8	-5	0	
10	14	-290	-150	-95		-50	-32		-16		-6	0	
14	18												
18	24	-300	-160	-110		-65	-40		-20		-7	0	
24	30												
30	40	-310	-170	-120		-80	-50		-25		-9	0	
40	50	-320	-180	-130									
50	65	-340	-190	-140		-100	-60		-30		-10	0	
65	80	-360	-200	-150									
80	100	-380	-220	-170		-120	-72		-36		-12	0	
100	120	-410	-240	-180									
120	140	-460	-260	-200		-145	-85		-43		-14	0	
140	160	-520	-280	-210									
160	180	-580	-310	-230									
180	200	-660	-340	-240		-170	-100		-50		-15	0	
200	225	-740	-380	-260									
225	250	-820	-420	-280									
250	280	-920	-480	-300		-190	-110		-56		-17	0	
280	315	-1050	-540	-330									
315	355	-1200	-600	-360		-210	-125		-62		-18	0	
355	400	-1350	-680	-400									
400	450	-1500	-760	-440		-230	-135		-68		-20	0	
450	500	-1650	-840	-480									
500	560					-260	-145		-76		-22	0	
560	630												
630	710					-290	-160		-80		-24	0	
710	800												
800	900					-320	-170		-86		-26	0	
900	1000												
1000	1120					-350	-195		-98		-28	0	
1120	1250												
1250	1400					-390	-220		-110		-30	0	
1400	1600												
1600	1800					-430	-240		-120		-32	0	
1800	2000												
2000	2240					-480	-260		-130		-34	0	
2240	2500												
2500	2800					-520	-290		-145		-38	0	
2800	3150												

In the formula Deviation $=\pm\frac{IT_n}{2}$, ITn is the IT value corresponding to 'n'.

Die Formel für die Abweichung $=\pm\frac{IT_n}{2}$, ITn ist der IT Wert entsprechend zu "n" zugeordnet.

Note: 1. If basic dimension ≤1mm, the basic deviation a and b are not adopted.

Bemerkungen: 1. Bei Abmessungen ≤ 1mm, sind die Basisabweichungen a und b nicvht berücksichtigt.

µm

Basic deviation value · Basistoleranzwerte Einheitswelle																		
Lower deviationei · geringste Abweichung																		
IT5 IT6	IT7	IT8	IT4 IT7	≤IT3 >IT7	Standard tolerance class · Standart Toleranzklasse													
j			k		m	n	p	r	s	t	u	v	x	y	z	zn	zb	zc
-2	-4	-6	0	0	+2	+4	+6	+10	+14		+18		+20		+26	+32	+40	+60
-2	-4		+1	0	+4	+8	+12	+15	+19		+23		+28		+35	+42	+50	+80
-2	-5		+1	0	+6	+10	+15	+19	+23		+28		+34		+42	+52	+67	+97
-3	-6		+1	0	+7	+12	+18	+23	+28		+33		+40		+50	+64	+90	+130
												+39	+45		+60	+77	+108	+150
-4	-8		+2	0	+8	+15	+22	+28	+35		+41	+47	+54	+63	+73	+98	+136	+188
										+41	+48	+55	+64	+75	+88	+118	+160	+218
-5	-10		+2	0	+9	+17	+26	+34	+43	+48	+60	+68	+80	+94	+112	+148	+200	+274
										+54	+70	+81	+97	+114	+136	+180	+242	+325
-7	-12		+2	0	+11	+20	+32	+41	+53	+66	+87	+102	+122	+144	+172	+226	+300	+405
								+43	+59	+75	+102	+120	+146	+174	+210	+274	+360	+480
-9	-15		+3	0	+13	+23	+37	+51	+71	+91	+124	+146	+178	+214	+258	+335	+445	+585
								+54	+79	+104	+144	+172	+210	+254	+310	+400	+525	+690
-11	-18		+3	0	+15	+27	+43	+63	+92	+122	+170	+202	+248	+300	+365	+470	+620	+800
								+65	+100	+134	+190	+228	+280	+340	+415	+535	+700	+900
								+68	+108	+146	+210	+252	+310	+380	+465	+600	+780	+1000
-13	-21		+4	0	+17	+31	+50	+77	+122	+166	+236	+284	+350	+425	+520	+670	+880	+1150
								+80	+130	+180	+258	+310	+385	+470	+575	+740	+960	+1250
								+84	+140	+196	+284	+340	+425	+520	+640	+820	+1050	+1350
-16	-26		+4	0	+20	+34	+56	+94	+158	+218	+315	+385	+475	+580	+710	+920	+1200	+1550
								+98	+170	+240	+350	+425	+525	+650	+790	+1000	+1300	+1700
-18	-28		+4	0	+21	+37	+62	+108	+190	+268	+390	+475	+590	+730	+900	+1150	+1500	+1900
								+114	+208	+294	+435	+530	+660	+820	+1000	+1300	+1650	+2100
-20	-32		+5	0	+23	+40	+68	+126	+232	+330	+490	+595	+740	+920	+1100	+1450	+1850	+2400
								+132	+252	+360	+540	+660	+820	+1000	+1250	+1600	+2100	+2600
			0	0	+26	+44	+78	+150	+280	+400	+600							
								+155	+310	+450	+660							
			0	0	+30	+50	+88	+175	+340	+500	+740							
								+185	+380	+560	+840							
			0	0	+34	+56	+100	+210	+430	+620	+940							
								+220	+470	+680	+1050							
			0	0	+40	+66	+120	+250	+520	+780	+1150							
								+260	+580	+840	+1300							
			0	0	+48	+78	+140	+300	+640	+960	+1450							
								+330	+720	+1050	+1600							
			0	0	+58	+92	+170	+370	+820	+1200	+1850							
								+400	+920	+1350	+2000							
			0	0	+68	+110	+195	+440	+1000	+1500	+2300							
								+460	+1100	+1650	+2500							
			0	0	+76	+135	+240	+550	+1250	+1900	+2900							
								+580	+1400	+2100	+3200							

- **Basic deviations value of hole**
- **Basistoleranzwerte Einheitsbohrung**

Diameter Durchmesser Ø (mm)		Basic deviation value · Basistoleranzwerte Einheitswelle																				
		Lower deviation EI · geringste Abweichung EI											Upper deviation ES · Höchstabweichung ES								
		Standard tolerance class · Standard Toleranzklasse											IT6	IT7	IT8	≤IT8	>IT8	≤IT8	>IT8	≤IT8	>IT8	≤IT7
>	≤	A	B	C	CD	D	E	EF	F	FG	G	H	JS	J			K		M		N		P to ZC
---	3	+270	+140	+60	+34	+20	+14	+10	+6	+4	+2	0	Die Formel für die Abweichung $=\pm\frac{IT_n}{2}$, ITn ist der IT Wert entsprechend zu "n" zugeordnet. In the formula Deviation $=\pm\frac{IT_n}{2}$, ITn is the IT value corresponding to 'n'.	+2	+4	+6	0	0	-2	-2	-4	-4	If IT ≥IT7, add a Δ value to the relevant value
3	6	+270	+140	+70	+46	+30	+20	+14	+10	+6	+4	0		+5	+6	+10	-1+Δ		-4+Δ	-4	-8+Δ	0	
6	10	+280	+150	+80	+56	+40	+25	+18	+13	+8	+5	0		+5	+8	+12	-1+Δ		-6+Δ	-6	-10+Δ	0	
10	14	+290	+150	+95		+50	+32		+16		+6	0		+6	+10	+15	-1+Δ		-7+Δ	-7	-12+Δ	0	
14	18																						
18	24	+300	+160	+110		+65	+40		+20		+7	0		+8	+12	+20	-2+Δ		-8+Δ	-8	-15+Δ	0	
24	30																						
30	40	+310	+170	+120		+80	+50		+25		+9	0		+10	+14	+24	-2+Δ		-9+Δ	-9	-17+Δ	0	
40	50	+320	+180	+130																			
50	65	+340	+190	+140		+100	+60		+30		+10	0		+13	+18	+28	-2+Δ		-11+Δ	-11	-20+Δ	0	
65	80	+360	+200	+150																			
80	100	+380	+220	+170		+120	+72		+36		+12	0		+16	+22	+34	-3+Δ		-13+Δ	-13	-23+Δ	0	
100	120	+410	+240	+180																			
120	140	+460	+260	+200		+145	+85		+43		+14	0		+18	+26	+41	-3+Δ		-15+Δ	-15	-27+Δ	0	
140	160	+520	+280	+210																			
160	180	+580	+310	+230																			
180	200	+660	+340	+240		+170	+100		+50		+15	0		+22	+30	+47	-4+Δ		-17+Δ	-17	-31+Δ	0	
200	225	+740	+380	+260																			
225	260	+820	+420	+280																			
260	280	+920	+480	+300		+190	+110		+56		+17	0		+25	+36	+55	-4+Δ		-20+Δ	-20	-34+Δ	0	
280	315	+1050	+540	+330																			
315	355	+1200	+600	+360		+210	+125		+62		+18	0		+29	+39	+60	-4+Δ		-21+Δ	-21	-37+Δ	0	
355	400	+1350	+680	+400																			
400	450	+1500	+760	+440		+230	+135		+68		+20	0		+33	+43	+66	-5+Δ		-23+Δ	-23	-40+Δ	0	
450	500	+1650	+840	+480																			
500	560					+260	+145		+76		+22	0					0		-26		-44		Wenn IT ≥IT7, wird der a Δ wert zuaddiert.
560	630																						
630	710					+290	+160		+80		+24	0					0		-30		-50		
710	800																						
800	900					+320	+170		+86		+26	0					0		-34		-56		
900	1000																						
1000	1120					+350	+195		+98		+28	0					0		-40		-66		
1120	1250																						
1250	1400					+390	+220		+110		+30	0					0		-48		-78		
1400	1600																						
1600	1800					+430	+240		+120		+32	0					0		-58		-92		
1800	2000																						
2000	2240					+480	+260		+130		+34	0					0		-68		-110		
2240	2500																						
2500	2800					+520	+290		+145		+38	0					0		-76		-135		
2800	3150																						

µm

Basic deviation value · Basistoleranzwerte Einheitswelle												Δ					
Upper deviation ES · Höchstabweichung ES																	
Standard tolerance class >IT7 · Standard Toleranzklasse >IT7												Standard tolerance class Standard Toleranzklasse					
P	R	S	T	U	V	X	Y	Z	ZA	ZB	ZC	IT3	IT4	IT5	IT6	IT7	IT8
-6	-10	-14		-18		-20		-26	-32	-40	-60	0	0	0	0	0	0
-12	-15	-19		-23		-28		-35	-42	-50	-80	1	1.5	1	3	4	6
-15	-19	-23		-28		-34		-42	-52	-67	-97	1	1.5	2	3	6	7
-18	-23	-28		-33		-40		-50	-64	-90	-130	1	2	3	3	7	9
					-39	-45		-60	-77	-108	-150						
-22	-28	-35		-41	-47	-54	-63	-73	-98	-136	-188	1.5	2	3	4	8	12
			-41	-48	-55	-64	-75	-88	-118	-160	-218						
-26	-34	-43	-48	-60	-68	-80	-94	-112	-148	-200	-274	1.5	3	4	5	9	14
			-54	-70	-81	-97	-114	-136	-180	-242	-325						
-32	-41	-53	-66	-87	-102	-122	-144	-172	-226	-300	-405	2	3	5	6	11	16
	-43	-59	-75	-102	-120	-146	-174	-210	-274	-360	-480						
-37	-51	-71	-91	-124	-146	-178	-214	-258	-335	-445	-585	2	4	5	7	13	19
	-54	-79	-104	-144	-172	-210	-254	-310	-400	-525	-690						
-43	-63	-92	-122	-170	-202	-248	-300	-365	-470	-620	-800	3	4	6	7	15	23
	-65	-100	-134	-190	-228	-280	-340	-415	-535	-700	-900						
	-68	-108	-146	-210	-252	-310	-380	-465	-600	-780	-1000						
-50	-77	-122	-166	-236	-284	-350	-425	-520	-670	-880	-1150	3	4	6	9	17	26
	-80	-130	-180	-258	-310	-385	-470	-575	-740	-960	-1250						
	-84	-140	-196	-284	-340	-425	-520	-640	-820	-1050	-1350						
-56	-94	-158	-218	-315	-385	-475	-580	-710	-920	-1200	-1550	4	4	7	9	20	29
	-98	-170	-240	-350	-425	-525	-650	-790	-1000	-1300	-1700						
-62	-108	-190	-268	-390	-475	-590	-730	-900	-1150	-1500	-1900	4	5	7	11	21	32
	-114	-208	-294	-435	-530	-660	-820	-1000	-1300	-1650	-2100						
-68	-126	-232	-330	-490	-595	-740	-920	-1100	-1450	-1850	-2400	5	5	7	13	23	34
	-132	-252	-360	-540	-660	-820	-1000	-1250	-1600	-2100	-2600						
-78	-150	-280	-400	-600													
	-155	-310	-450	-660													
-88	-175	-340	-500	-740													
	-185	-380	-560	-840													
100	-210 -220	-430 -470	-620 -680	-940 -1050													
-120	-250 -260	-520 -580	-780 -840	-1150 -1300													
-140	-300 -330	-640 -720	-960 -1050	-1450 -1600													
-170	-370	-820	-1200	-1850													
	-400	-920	-1350	-2000													
-195	-440 -460	-1000 -1100	-1500 -1650	-2300 -2500													
-240	-550 -580	-1250 -1400	-1900 -2100	-2900 -3200													

Hardness reference table (conversion of hardness and strength for ferrous metal)
Härte Vergleichstabelle (Konversationstabelle von Härte und Zugfestigkeit für Stahl)

Hardness · Härte				Tensile strength Zugfestigkeit N/mm²
Rockwell hardness · Härte		Vickers hardn. · Härte	Brinell hardn. · Härte	
HRC	HRA	HV	HB	
70.0	86.6	1037	—	—
69.5	86.3	1017	—	—
69.0	86.1	997	—	—
68.5	85.8	978	—	—
68.0	85.5	959	—	—
67.5	85.2	941	—	—
67.0	85.0	923	—	—
66.5	84.7	906	—	—
66.0	84.4	889	—	—
65.5	84.1	872	—	—
65.0	83.9	856	—	—
64.5	83.6	840	—	—
64.0	83.3	825	—	—
63.5	83.1	810	—	—
63.0	82.8	795	—	—
62.5	82.5	780	—	—
62.0	82.2	766	—	—
61.5	82.0	752	—	—
61.0	81.7	739	—	—
60.5	81.4	726	—	—
60.0	81.2	713	—	2555
59.5	80.9	700	—	2500
59.0	80.6	688	—	2450
58.5	80.3	676	—	2395
58.0	80.1	664	—	2345
57.5	79.8	653	—	2295
57.0	79.5	642	—	2250
56.5	79.3	631	—	2205
56.0	79.0	620	—	2160
55.5	78.7	609	—	2115
55.0	78.5	599	—	2075
54.5	78.2	589	—	2035
54.0	77.9	579	—	1995
53.5	77.7	570	—	1955
53.0	77.4	561	—	1920
52.5	77.1	551	—	1885
52.0	76.9	543	—	1850
51.5	76.6	534	—	1815

Hardness · Härte				Tensile strength Zugfestigkeit N/mm²
Rockwell hardness · Härte		Vickers hardn. · Härte	Brinell hardn. · Härte	
HRC	HRA	HV	HB	
51.0	76.3	525	501	1780
50.5	76.1	517	494	1750
50.0	75.8	509	488	1720
49.5	75.5	501	481	1690
49.0	75.3	493	474	1660
48.5	75.0	485	468	1630
48.0	74.7	478	461	1605
47.5	74.5	470	455	1575
47.0	74.2	463	449	1550
46.5	73.9	456	442	1525
46.0	73.7	449	436	1500
45.5	73.4	443	430	1475
45.0	73.2	436	424	1450
44.5	72.9	429	418	1430
44.0	72.6	423	413	1405
43.5	72.4	417	407	1385
43.0	72.1	411	401	1360
42.5	71.8	405	396	1340
42.0	71.6	399	391	1320
41.5	71.3	393	385	1300
41.0	71.1	388	380	1280
40.0	70.8	382	375	1260
40.0	70.5	377	370	1245
39.5	70.3	372	365	1225
39.0	70.0	367	360	1210
38.5	—	362	355	1190
38.0	—	357	350	1175
37.5	—	352	345	1160
37.0	—	347	341	1140
36.5	—	342	336	1125
36.0	—	338	332	1110
35.5	—	333	327	1095
35.0	—	329	323	1080
34.5	—	324	318	1065
34.0	—	320	314	1050
33.5	—	316	310	1035
33.0	—	312	306	1020
32.5	—	308	302	1010

Hardness reference table (conversion of hardness and strength for ferrous metal)
Härte Vergleichstabelle (Konversationstabelle von Härte und Zugfestigkeit für Stahl)

Hardness · Härte				Tensile strength Zugfestigkeit N/mm²		Hardness · Härte				Tensile strength Zugfestigkeit N/mm²
Rockwell hardness · Härte		Vickers hardn. · Härte	Brinell hardn. · Härte			Rockwell hardness · Härte		Vickers hardn. · Härte	Brinell hardn. · Härte	
HRC	HRA	HV	HB			HRC	HRA	HV	HB	
32.0	—	304	298	995		24.0	—	249	245	820
31.5	—	300	294	980		23.5	—	246	242	810
31.0	—	296	291	970		23.0	—	243	240	800
30.5	—	292	287	960		22.5	—	240	237	790
30.0	—	289	283	950		22.0	—	237	234	785
29.5	—	285	280	935		21.5	—	234	232	775
29.0	—	281	276	920		21.0	—	231	229	765
28.5	—	278	273	910		20.5	—	229	227	760
28.0	—	274	269	900		20.0	—	226	225	750
27.5	—	271	266	890		19.5	—	223	222	745
27.0	—	268	263	880		19.0	—	221	220	735
26.5	—	264	260	870		18.5	—	218	218	730
26.0	—	261	257	860		18.0	—	216	216	725
25.5	—	258	254	850		17.5	—	214	214	715
25.0	—	255	251	835		17.0	—	211	211	710
24.5	—	252	248	830						

Note: The conversion values for steel in the table are commonly applicable for the steels with carbon from low to high.
Bemerkung: Die in der Tabelle aufgeführten Werte sind für Kohlenstoffstahl anwendbar.

Comparison table for turning inserts chip breaker · Übersichtstabelle der WSP-Spanbrecher

ISO		Application Anwendung	ZCC CT		Sandvik		Seco		Kennametal		ISCAR		Walter		Mitsubishi		Sumitomo		Tungaloy		Kyocera	
			Neg	Pos	Neg	Pos	Neg	Pos	Neg	Pos	Neg	Pos	Neg	Pos	Neg	Pos	Neg	Pos	Neg	Pos	Neg	Pos
Steel · Stahl	P	Wiper-finishing Wiper-Schlichten	WG		WF WL	WF WK	W-MF2	W-F1	FW MW	FW MW	WF		NF	PF	SW	FW	NLU-W	NLU-W	ASW		WP	
		Finishing Schlichten	DF EF	SF HF	PF QF	PF UF 23	FF1 MF1	FF1 F1	FF FN	11 UF LF	SF	PF SM	NF3 NS6	PF4 PF5	FH FS	FJ FV	NSU NLU NFA NFL	NLU NFP NFK	TF TS 17	PF 01	DP GP VF	CF
		Sem-finishing Schli-Mittlere Bearb.	DM EM	HM	PM QM	PM UM	MF2	F2	FN	MF	NF TF SM	14 16 17 19	NS6	PS5	SH SA	SW SV MV	NSX	NSU NSC NSK	TS TM AS	PS	HQ CQ CJ	CK DP GP VF XP
		Medium machining -light roughing Mittlere Bearb.-leichte Schruppbearbeitung	DM PM	HR	PM QM	PR UR	M3 MF3	F2	MN	MF	GN PP NR	17 19	NM4 NM6	PM5	MV MZ MA	MV MW	NGE NGU NUX	NMU NSF	TM DM	PM	GS CS HS PS	HQ XQ GK G
		Wiper-medium			WR WM	WM	W-M3 W-R4 W-R7	W-F2	MW RW	MW	WG		NM	PM	MW		NGU-W				WQ	
		Roughing Schruppen	DR HDR 31		PR QR 31		M5 MR5 MR7		RP UN RN		TNM GN	19	NM9		GH MAT MT		NMU NMX	NMU	TH TR TU		PT GT HT	G St-form
		Single Side rough. Eins. WSP Schruppen			HR QR		R8 RR9 -56 -57 -UX		RH RM RP		NM		NR6 NR8		HA HZ HH HV HX		NMP NHG NHP NHU NHW				HX	
Stainless Steel · Rostfreier Stahl	M	W.finishing Wiper-Schlichten	WG		WF WL	WF WK	W-MF2		FW MW	FW MW	WF			PF	SW	FW	NLU-W	NLU-W				
		Finishing Schlichten	EF DF	HF	MF	MF UF	FF1 F2 MF1	F1	FF FP	11 UF LF	NF VL	PF SM	NF4	PF4 PF5	FS	FJ FV	NSU NLU	NSU NLU	SS	SS	GU	
		Sem-finishing Schli.Mittl.Bearb.	EF EM	HF HM	MF MM	MF MM UM	MF3	F2	FP	MF	PP TF	14 16 17 19	NM4	PS5	SH MS	SW SV MV	NEX NUP	NSU	SS SM	PS	MS	CK DP GP VF XP
		Medium machining -light rough. Mittlere Bearb. -leichtes Schruppbearbeitung	EM DM	HM	MM	MM UM	R6 56	F2	MP	HP	PP TF	17 19	NM4 NR4	PM5	MS ES MH	MV MW	NGU	NMU	SA S	PM	MS	HQ XQ GK G
		Wiper. medium			WR WM	WM	W-M3		MW RW	MW	WG			PM	MW		NGU -W					
		Roughing Schruppen	ER DR HDR	HR	MR QR PR	MR	R7 R8		MP -P		HTW NR	19	NR4		GH HZ		NMU NMX NHG					
		Single Side roughing Einseitge WSP Schruppen	ER DR HDR		HR QR		-56		RP		NM						NMP NHG NHP NHU NHW	NMP NHG NHP NHU NHW				

Comparison table for turning inserts chip breaker · Übersichtstabelle der WSP-Spanbrecher

ISO		Application Anwendung	ZCC CT		Sandvik		Seco		Kennametal		ISCAR		Walter		Mitsubishi		Sumitomo		Tungaloy		Kyocera	
			Neg	Pos	Neg	Pos	Neg	Pos	Neg	Pos	Neg	Pos	Neg	Pos	Neg	Pos	Neg	Pos	Neg	Pos	Neg	Pos
Cast iron · Guss	K	Wiper-finishing W.-Schlichten	WG		WF WM	WF	W-MF2	W-F1	FW MW	FW MW	WF						NLU-W	NLU-W				
		Finishing Schlichten	DF	HF	KF	KF	F1	F1	FF FN	11 UF LF	NF SM	14 19		PS5			NSU	NLU			C	
		Sem-finishing Schlichten-Mittl. Bearbeitung	PM	HM	KF KM	KF KM	M3	F2	FN	MF	GN	14 19	NM5	PS5	GH		NUX NGU	NSU	CM		C Stand. form	
		Medium machining-light roughing Mittl. Bearbeitung-leichte Schruppbearbeitung	DR	HM HR	KM QM	KM	M3	F2	UN	HP	GN NR		NM6	PM5			NUZ NGU	NMU	CM		GC ZS	
		Wiper medium					W-M3 W-R4 W-R7		MW	MW	WG		NM	PM			NGU-W					
		Roughing Schruppbearbeitung	DR *NMA	HR	KR QR	KR UR	M5				NR		NR6		GH		NMU	NHG NHU NHW			ZS	
Nonferrite Materials Ne-metalle	N	Finishing Schlichten		LH		AL				LF	NF			PM2								
		Sem-finishing Schlichten-Mittl. Bearbeitung		LH		AL		AL	GP		NF PP	AS						NAG			AH	AH
		Medium machining-light roughing Mittlere Bearbeitung-leichtes Schruppbearbeitung		LH		AL		AL	GG-FS MS	HP	NMS											
Heat resist. super alloys & Ti-alloys Warmf. Legi. & Ti-Legierung	S	Finishing Schlichten	NF		NGP	MF	MF1		FS	GT-HP	SF PF	PF SM		PF4	FJ		NSU	NSU				
		Sem-finishing Schlichten-Mittlere Bearbeitung	NF NM EM		23	MM	MF1 M1		FS MS	GT-MF	SF PF	PF SM		PF5	MJ		NEX NUP	NSU NSK				
		Medium machining-light roughing Mittlere Bearbeitung-leichtes Schruppen	NM EM DM		MF	MM UM	M1		MS	MT-LF	PP TF			PS5	MS		NMU	NSK				
		Roughing Schruppbearbeitung	ER		SR		MR3 MR4		RP		TF HTW NR				GJ							

Coated Cemeted Carbide CVD · beschichtetes Hartmetall CVD

ISO		ZCC CT	Sandvik	Kennametal	Sumitomo	Mitsubishi	Toshiba Tungaloy	Kyocera	Walter	Iscar	SECO
Steel · Stahl	P01	**YBC152**	GC4005	TN7005 KC9110	AC700G	UE6005	T9005	CR7015	WPP01	IC9150	TP1000
		YBC151	GC4205			UE6010		CA5505	WPP05		
	P10	**YBC152**	GC4015	TN7010 KC9110	AC700G	UE6010	T9005	CR7015 CA5505	WAP10	IC9150	TP1000
		YBC151	GC4215		AC2000	UC6010	T9015	CA5025	WPP10	IC9250	TP2000
		YBC252	GC4025						WPP05	IC9015	
		YBC251	GC4225								
	P20	**YBC252**	GC4015	TN7015 TN7025	AC2000	UE6010	T9015	CR5025	WAP20	IC9250	TP2500
		YBC251	GC4215	KCP025 KC9125	AC900G	UE6020	T9025	CR7025	WPP20	IC9015	TP2000
		YBC351	GC4025	KC8050		UC6010				IC9025	
			GC4225							IC9350	
			LC25								
	P30	**YBC252**	GC4025	TN7025 TN7035	AC830P	UE6035	T9025	CR7025 PR630	WAP30	IC9350	TP2500
		YBC251	GC4225	KCP025 KC9140	AC3000	UH6400	T9035		WPP30	IC9025	TP3000
		YBC351	GC4035	KC8050		US735					
			GC4235								
	P40	**YBC351**	GC4035	KC9145	AC830P	UE6035	T9035	PR660	WAP30	IC9350	TP3000
			GC4235		AC3000	UH6400			WPP30		
						US735					
Stainless Steel · Rostfreier Stahl	M10	**YBM151**	GC2015		AC610M	US7020	T6020	CA6015 PR915	WAM10	IC9250	TP200
	M20	**YBM151**	GC2015	TN7025 TN7035	AC610M	US7020	T6020	CA6015 PR930	WAM20	IC9350	TP200
		YBM251	GC2025	TN8025 KC9225	AC630M					IC9025	TP3000
											TP400
	M30	**YBM351**	GC2025	TN7025 TN7035	AC630M	US735	T6030	PR660	WAM20	IC9350	TP3000
			GC2035	TN8025 KC8050						IC9025	TP400
			GC235	KC9225							
	M40	**YBM351**	GC2035	KC9240	AC630M	US735		PR660			TP3000
			GC235		AC3000						
Cast iron · Guss	K01	**YBD052**	GC3005	TN5015	AC410K	UC5005	T5010	CA4115 CA4010	WAK10		
		YBD102	GC3205			UC5105					
		YBD151	GC3210			UC5015					
						UC5115					
	K10	**YBD052**	GC3005	TN5015 KC9315	AC410K	UC5005	T5010	CR4010	WAK10	IC428	TK1000
		YBD102	GC3205		AC700G	UC5105	T5020	CR7015 PR610	WAK20	IC 4028	TK2000
		YBD151	GC3210			UC5015				IC9150	TP1000
		YBD152	GC3015			UC5115				IC9007	
			GC3215								
	K20	**YBD151**	GC3210	TN5015 KC9320	AC900G	UC5015	T5020	CA4120	WAK20	IC428	TK2000
		YBD152	GC3215	KC9325 KC8050		UC5115				IC 4028	TP200
		YBD252								IC9150	TP1000
										IC9007	
	K30	**YBD252**		KC8050					WAK30		

Coated Cemeted Carbide PVD · beschichtetes Hartmetall PVD

ISO		ZCC CT	Sandvik	Kennametal	Sumitomo	Mitsubishi	Toshiba Tungaloy	Kyocera	Walter	Kyocera	Iscar	SECO
Steel · Stahl	P	P01	GC1005					PR915		PR915		
		P10	GC1525 GC1025	KC5010		VP15TF	AH710	PR930		PR930	IC507 IC570 IC907 IC908	
		P20	GC1525 GC1025	KC5010	AC530U ACZ310	VP15TF VP20MF	AH710	PR930		PR930	IC507 IC570 IC907 IC908	CP250 CP500
		P30	GC1025 GC2035	KC5025	AC530U	VP20MF UP20M	GH330 GH730 AH330 AH120 AH740	PR660		PR660	IC3028	CP250 CP500 CP600
		P40	GC2035			UP20M	AH120				IC3028	CP600
Stainless Steel Rostfreier Stahl	M	M10	GC1005 GC1105 GC1525	KC5010	AC530U	VP15TF		PR660		PR660	IC507 IC520 IC570 IC907 IC908	CP200
		M20	GC1025 GC1105	KC5010	AC530U	VP15TF VP20MF	GH330 GH730	PR660	WSM30	PR660	IC507 IC907 IC908 IC3028	CP200 CP250 CP500
		M30	GC2035	KC5025 KC9245		VP20MF UP20M	AH120		WSM30		IC3028 IC908	CP250 CP500 CP600
		M40	GC2035	KC9245		UP20M	AH140		WSM30			CP600
Cast Iron · Guss	K	K01	GC1005				AH110					
		K10	GC1005	KC5010		VP15TF	GH110 AH110	PR610		PR610	IC8028	CP200
		K20		KC5025		VP15TF	AH120				IC908 IC8028	CP200 CP250 CP500
		K30				VP15TF					IC908	CP500
Heat resist. super all. & Ti-alloys Warmf. Legi. & Ti-Legierung	S	S01	GC1005			VP05RT	AH110					
		S10	GC1005 GC1105 GC1025	KC5010 TN6010	AC510U EH510Z	VP05RT VP10RT	AH120				IC507 IC907	CP250
		S20	GC1105 GC1025	KC5010 KC5025 TN6010 TN6025	AC520U EH520Z	VP10RT VP15TF					IC507 IC907 IC3028	CP250 CP600
		S30		KC9245		VP15TF					IC3028	CP250 CP600
Nonferrite Mat. Ne-metalle	N	N01	CD1810 CD10		DL1000		GH110					
		N10	CD1810 CD10	KC5410	DL1000				WXN10			
		N20		KC5410								

1101SC05 C56-C59
1105SC03 C56-C59
1143SC90 C68
1143SC120 C68
1165PA03 C60-C62
1165PC03 C63-C65
1534SH03 C55
1534ST03C C42-C53
1534SU03 C10-C39
1534SU03C C10-C39
1536ST05C C42-C53
1536SU05 C10-C39
1536SU05C C10-C39
1538SU08C C10-C38
154.3 A267
1557SU03 C40
1576PC05 C66-C67
1579PC15C C66
1734SU03C C10-C39
1736ST05C C42-C53
1736SU05C C10-C39
175.32-22 A82
175.32-24 A82
175.32-25 A82
175.32-28 A82

3101H7 C109
3102H7 C110
3103H7 C111

4111 C125
4201A C122
4201C C121
4202A C124
4202C C123

5501R302GM B201
5501R303GM B206
5501R304GF B213
5501R38414GM B217
5502R302GM B203
5502R303GM B208
5502R304GF B215
5502R38414GM B218
5502R402NM B270
5502R453GM B210
5502R55MHH B247
5508R454GM B220
5565R302GF B228
5565R302GH B252
5565R302HH B255-B256
5565R302NH B280
5566R302GF B230
5566R302GH B253
5566R302HH B256
5566R302NH B281
5566R304HH B259
5585R302NHR B284
5585R304GHR B237
5585R554HHR B264
5586R302NHR B286
5586R304GHR B239
5586R554HHR B265
5589R45MGFR B223
5601R302GM B202
5601R303GM B207
5601R304GF B214
5602R302GM B204
5602R303GM B209
5602R304GF B216
5602R304GR B241
5602R38414GM B219
5602R453GM B211
5602R454GM B221
5665R202GM B229

AL-2B B282
AL-2E B277
AL-2EL B278
AL-2R-AIR B285
AL-2RL-AIR B287
AL-3E B279
AL-3R-AIR B288
AL-3RL-AIR B289
AL-3W B283

APET1604 B156
APET16Q5 B156
APKT-KM B145 B157
APKT-LH B85 B91 B95 B155
APKT-PF B85 B91 B95 B155
APKT-PM B85 B91 B95 B145 B155 B157
APKT-PR B85 B91 B95 B155
APMT_PDER B99 B156
APMT_PDR B99 B156

BMR01 B100
BMR02 B103
BMR03 B105-B108
BMR04 B117-B118
BT-ER-H D6
BT-M D20
BT-MW D22
BT-XM D15 D17
BT-XP D12
BT-XS D24
BT-ZC D10

C16M A271
CCLNR/L A204
CCGT-SF A84
CCGX-LH A86
CCGW A123
CCMT A127
CCMT-EF A85
CCMT-EM A85
CCMT-HF A84
CCMT-HM A85
CCMT-HR A86
CCMW A86 A128
CDJNR/L A205
CKJNR/L A203
CKNNR/L A203
CMA01 B148
CMD01 B149
CMZ01 B147
CNEG-NF A47
CNGA A118 A138
CNGN A139
CNGX A140
CNMA A51
CNMG A51
CNMG-DF A46
CNMG-DM A48
CNMG-DR A49
CNMG-EF A46
CNMG-EM A48
CNMG-ER A50
CNMG-NM A49
CNMG-PM A47
CNMG-SF A46
CNMG-WG A46
CNMM A52
CNMM-DR A50
CNMM-ER A50
CNMM-HDR A50
CPGT A84
CPGT-SF A87
CPGW A87
CRDNN A207
CSDNN A207
CSKNR/L A206
CSRNR/L A206
CTJNR/L A204
CTUNR/L A205

DCGT-SF A88
DCGX-LH A90
DCGW A90 A124
DCMT A129
DCMT-EF A89
DCMT-EM A89
DCMT-HF A88
DCMT-HM A89
DCMT-HR A90
DCMW A90 A130
DNEG-NF A54
DNGA A119 A140
DNGN A141
DNGX a141
DNMA A57
DNMG A58
DNMG-DF A53
DNMG-DM A55
DNMG-DR A56
DNMG-EF A54
DNMG-EM A56
DNMG-ER A58
DNMG-FM A54
DNMG-NM A56
DNMG-PM A54 A55
DNMG-SF A53
DNMM-DR A58
DNMM-ER A58
DNMM-HDR A58
DNMX-WG A53
DPGT-SF A91
DPMW A91

EMP01 B83-B84
EMP02 B90
EMP03 B93
EMP04 B94
EMP05 B98
ER-A D25
ER-DM D27
ER-GB D28
ER-UP D26

FMA01 B26
FMA02 B27
FMA03 B31
FMA04 B34 B38
FMA05 B41
FMD02 B43 B45
FMD03 B47
FME01 B50
FME02 B52
FME03 B54
FME04 B58
FMP01 B60
FMP02 B62-B63
FMP03 B68
FMR01 B70
FMR02 B73
FMR03 B75-B76
FMR04 B78-B79

G-ER-H D8
GM-2BL B231
GM-2BS B233
GM-2BP B234-B235
GM-2EL B205
GM-2EP B225-B226
GM-2ES B227
GM-2R B236
GM-4B B232
GM-4E B212
GM-4EL B222
GM-4R B238
GM-4RL B240
GM-4W B242
GM-6EL B224

HM-2B B254
HM-2BFP B258
HM-2BL B257
HM-2BS B261
HM-2BP B262-B263
HM-2EP B249-B250
HM-2ES B251
HM-4B B260
HM-4E B245
HM-4EL B246
HM-4R B266
HM-4RF B267
HM-4RP B268
HM-6EL B248
HMP01 B142-B143
HMP01 EC B144
HNEX-DF B44 B157
HNEX-DM B44 B157
HNEX-DR B44 B157
HNEX-MR B44 B157
HSK-A-ER-H D7
HSK-A-XM D18
HSK-A-XP D13

JCLNR/L A208
JDJNR/L A208
JSDNN A209
JT-ER-H D5
JT-M D19
JT-MW D21
JT-XM D14 D16
JT-XP D11
JT-XS D23
JT-ZC D9

KNUX A81

LNCX B159
LNE32.53 B51 B158
LNKT-ZR B48 B59 B69
LT** LT**

MCBNR/L A170
MCLNR/L A171
MDJNR/L A172
MDPNN A173
MPHT B131 B141 B160
MRDNN A184
MRGNR/L A184
MSBNR/L A174
MSDNN A177
MSKNR/L A176
MSRNR/L A175
MTGNR/L A178
MTJNR/L A179
MTFNR/L A180
MVJNR/L A182
MVVNN A181
MWLNR/L A183

NM-2B B274
NM-2BP B275
NM-2E B271
NM-2EP B273
NM-4E B272

OFKR-DF B39 B161
OFKR-DM B39 B161
OFKT-DF B35 B160
OFKT-DM B35 B160
OFKT-LH B35 B160

PCBNR/L A158
PCLNR/L A159 A216
PDJNR/L A160
PDNNR/L A161
PDSNR/L A218
PDSNN PDSNN
PDUNR/L A219
PNEG B46 B158
PSBNR/L A162
PSDNN A163
PSKNR/L A164 A221
PSSNR/L A165
PTFNR/L A166 A222
PTGNR/L A168
PTTNR/L A167
PWLNR/L A169 A223

Q*DR A284
QE*D A272
QEBD A271
QECD A273
QE*S A272 A274 A275
QFFD A278
QFGD A278
QF*D A276 A282
QF*S A279
QF** A277 A278-A281 A283
QT A288
QX*D A273
QZQ A286
QZS A275 A287
QZSL A287
QZSR A287

RCGT A92
RCGX-LH A92
RCKT-DM B71 B74 B161
RCKT-DR B71 B74 B161
RCMT A92
RCMX A93
RDKW B77 B80 B162
RNGN A146
RNMG A80
ROHX B104 B162
RT** A296-A302

SCACR/L A185
SCFCR A239
SCGX-LH A95
SCLCR/L A186 A224 A240 A242
SCLPR/L A235 A242
SCMT A95
SCMT-EF A94
SCMT-EM A94
SCMT-HF A94
SCMT-HM A94
SCMT-HR A95
SCMW A95
SDACR/L A187
SDJCR/L A188
SDMT B163
SDMT-DM B133 B163
SDNCN A189
SDQCR/L A226 A243
SDQPR/L A236 A243
SDUCR/L A227 A244
SDUPR/L A237 A244
SDZCR/L A228
SEEN B32 B166
SEET-CF B28 B164
SEET-CM B28 B164
SEET-CR B28 B164
SEET-DF B28 B164
SEET-DM B28 B164
SEET-DR B28 B164
SEET-EF B28 B164
SEET-EM B28 B164
SEET-LH B28 B64 B164 B165
SEET_PER-* B64 B165
SEET-W B28 B164
SEKN B32 B166
SEKR B32 B166

SM-4R B292
SMP01 B125-B126
SMP03 B129-B130
SNGA A120 A142
SNGN A67 A143
SNGX A142
SNKN B42 B173
SNMA A66
SNMG A65
SNMG-DF A59
SNMG-DM A61
SNMG-DR A62
SNMG-EF A59
SNMG-EM A61
SNMG-ER A63
SNMG-NM A62
SNMG-PM A60
SNMG-SF A60
SNMM A65 A66
SNMM-DR A62 A63
SNMM-ER A63
SNMM-HDR A64
SNR/L A305
SNUN A67
SPAN B167
SPCN B167
SPEX B56 B170
SPGN B172
SPMR B171
SPMT B150 B163 B169
SPMT-HT B169
SPMT-KM B145 B169
SPMT-KT B169
SPMT-PM B145 B169
SPMW A96
SPKN B55 B168
SPKR-GM B55 B170
SPKT B53
SPKW B53 B169
SPUN B172
SP_N SP_N
SRDCN A201
SRGCR/L A202
SSBCR/L A195
SSDCN A195
SSKCR/L A196 A229
SSSCR/L A196
STACR/L A197
STFCR/L A197 A230 A246
STGCR/L A198
STTCR/L A199
STUPR/L A238 A245
SWACR/L A200
SWR/L A304
SVABR/L A191
SVVBN A192
SVVCN A193
SVJBR/L A190
SVJCR/L A194
SVQBR/L A233
SVQCR/L A231 A247
SVUBR/L A234
SVUCR/L A232 A248

TBGH-L A97
TCGW A125
TCGX-LH A101
TCGT-SF A98
TCMT A102 A131
TCMT-EF A100
TCMT-EM A100
TCMT-HF A99
TCMT-HM A101
TCMT-HR A101
TCMW A102 A132
TMP01 B140
TNGA A121 A144
TNGN A145
TNMA A73
TNMG A72
TNMG-DF A68
TNMG-DM A69
TNMG-DR A70
TNMG-EF A68
TNMG-EM A70
TNMG-ER A71
TNMG-FM A69
TNMG-PM A69
TNMG-SF A68
TNMM A73
TNMM-DR A71
TNMM-HDR A72
TNMX A83
TNMX-WG A68
TPAN B174
TPCN B174
TPGA A104
TPGB A105
TPGH-L A103
TPGN B176
TPGT-SF A103
TPGW A105
TPKN B61 B175
TPMR B177
TPUN B177

VBET-NF A108
VBGT-SF A108
VBGW A126
VBMT A133
VBMT-53 A108
VBMT-EF A108
VBMT-EM A109
VBMT-HF A108
VBMT-HM A109
VBMT-HR A109
VBMW A109 A133
VCGT A106
VCGT-HF A106
VCGT-NF A106
VCGT-SF A106
VCGW A126
VCGX-LH A107
VCMT A134
VCMT-EM A110
VCMW A134

VNEG-NF A74
VNGA A122
VNMG A75
VNMG-DF A74
VNMG-DM A75
VNMG-EF A74
VNMG-EM A75
VNMG-NM A75
VNMG-PM A75
VNMG-SF A74
VSM-4E B291

WCMX C100
WCMX-53 A111
WCMX-D WCMX-D
WCMX-PG WCMX-PG
WNMA A79
WNGA A122 A146
WNEG-NF A77
WNMG-DF A76
WNMG-DM A78
WNMG-DR A79
WNMG-EF A77
WNMG-EM A78
WNMG-NM A79
WNMG-PM A78
WNMG-SF A77
WNMG-WG A76
WPGT B137 B179

XEEN B178
XEEQ B178
XMR01 B132 B135-B136
XPHT-GM B109 B179
XSEQ B127 B180

YNMX A83
YNUX A83

ZC D29
ZD03 C96-C97
ZDET B101 B180
ZIGQ-NM A266
ZIMF-NM A265
ZOHX-GF B119 B181
ZOHX-GM B119 B181

ZP*D-MG A261
ZP*D-MG-* A262
ZP*S-MG A261

ZPNT B101 B181
ZQMX ZQMX
ZQMX-1E A267
ZR*D-MG A264
ZR*D-EG A264
ZR*D-LH A266

ZSMF-L A268
ZSMF-R A268
ZT*D-EG A263
ZT*D-MG A263
ZT*S-MG A263
ZTBD-MG A262

NOTIZEN:

Test Report
Versuchsprotokoll

Date

ZCC Cutting Tools Europe GmbH

General	Allgemein	End User / Anwender	Distributor / Händler
Company	Firma		
Contact person	Gesprächspartner		

Machine	Maschine
Type	Typ
Producer	Hersteller
Power (kW)	Leistung (kW)
Adaptor/Tooling System	Werkzeugaufnahme
Workpiece	**Werkstück**
Material	Werkstoff
Hardness/Tensile Strength	Härte / Zugfestigkeit N/mm²
Heattreatment/Surface	Wärmebeh./Oberfläche
Interrupt cutting	Schnittunterbrechungen

Cutting tools	Werkzeug				
Producer/Supplier	Hersteller (Halter)				
Toolholder/Milling body	Halter Bezeichnung				
Teeth Z	Zähnezahl Z				
Producer/Supplier	Hersteller(Werkzeug)				
Inserts type/Tool Nr.	Platten-Typ/Werkzeug Nr.				
Grade	Schneidstoff Sorte				
Solid carbide tools art	Vollhartmetallwerkzeug Nr.				
Cooling	Kühlmittel int./ext.				
Cutting Data	**Schnittdaten**				
RPM n=U/min	Drehzahl n=U/min				
Cutting speed Vc=m/min	Schnittgeschw. Vc=m/min				
Feed rate f=mm/r	Vorschub f=mm/U				
Feed rate. Vf=mm/min	Vorschubgeschw. Vf=mm/min				
Depth of cut a_p mm	Schnitttiefe a_p mm				
Depth of cut a_e mm	Schnittbreite a_e mm				
Machining length mm	Eingriffslänge mm				
Cutting time T min	Eingriffszeit T min				
Results	**Ergebnis**				
Machined pieces/Edge	Anzahl Werkst. / Schneidkante				
Surface quality	Oberfläche Werkstück				
Flankwear VB	Freiflächenverschleiß VB				
Criteria	Kriterium				
Notch Wear	Kerbverschleiß				
Crater Wear	Kolkverschleiß				
Plastic deformation	Plastische Verformung				
Built-up edge	Aufbauschneidenbildung				
Insert breakage	Plattenbruch				
Cutting edge breakage	Schneidkantenbruch				

Chipforms **Spanformen**

1 

2 

3 

4 

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8 

9 

○	○	○	○

Conclusion / Zusammenfassung

Fax: 0049-211-989240-111
E-mail: info@zccct-europe.com

Sign / Unterschrift .....

NOTIZEN:




ZCC-CT




ZCC-CT





ZCC-CT mit Sitz in Zhuzhou, Hunan in China gehört zur ZCC-Group. Seit der Gründung 1953 hat sich der Konzern auf dem Gebiet der Hartmetallproduktion durch neueste Technologien sowie hochqualifiziertes Personal zu einem der weltweit führenden Hartmetallhersteller entwickelt. Die Europazentrale ZCC Cutting Tools GmbH betreut den europäischen Markt von Deutschland aus. Die Geschäftsführung, der Vertrieb, das Marketing, die Technische Abteilung, sowie das Europalager und der Lieferservice haben ihren Sitz in Düsseldorf.

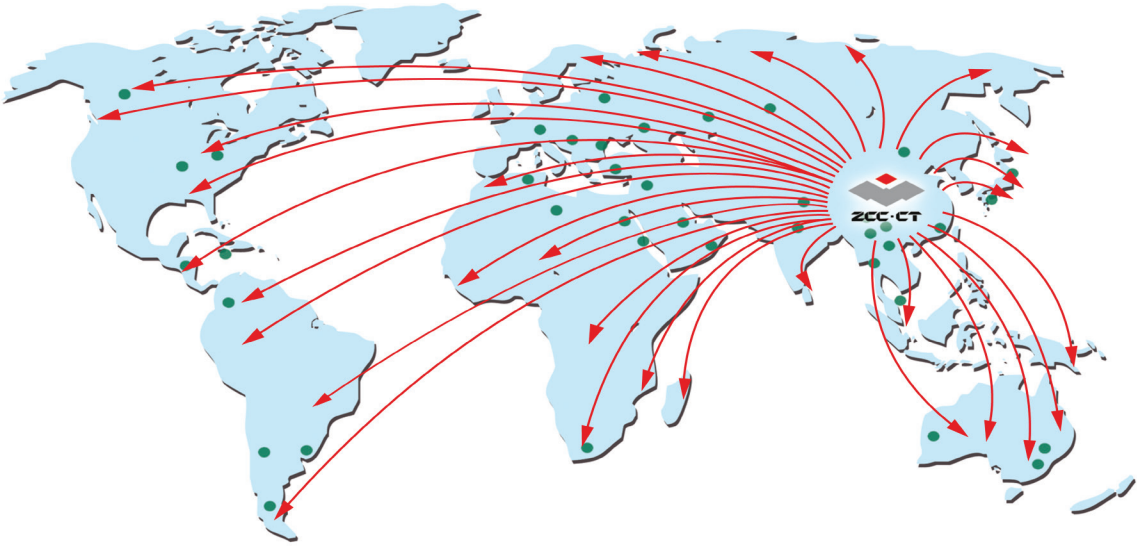
Forschung und Entwicklung hat bei ZCC-CT einen besonders hohen Stellenwert. Für diesen Bereich werden weltweit die modernsten Anlagen genutzt und überdurchschnittlich hohe Investitionen getätigt.
Absolute Spitzenprodukte in überragender Qualität mit stetiger Weiterentwicklung. Selbstverständlich ist ZCC-CT ISO Zertifiziert. Um diesen Anspruch weltweit optimal umsetzen zu können, werden die höchsten Anforderungen in Bezug auf Know-How, Personal, Maschinen und Anlagen erfüllt.

Das komplette Lieferprogramm beinhaltet WSP, Halter, VHM, Cermet, PKD, CBN und Keramik Werkzeuge.
Der Katalog enthält technische Angaben die zur Einsatzempfehlung dienen. Diese Werte sind Richtwerte. Bitte berücksichten Sie, dass Sie die Schnittdaten praxisbezogen anpassen.

ZCC-CT located at Zhuzhou, Hunan in P.R. China belongs to the ZCC Group. Since its foundation in 1953 ZCC has developed by a highly advanced technology as well as highly qualified personnel to one of the leading carbide manufacturers worldwide. The European Headquarter ZCC Cutting Tools Europe GmbH is responsible for the European market. The management, sales, marketing, technical department as well as the European warehouse and the delivery service are located in Düsseldorf, Germany.

Research and development plays a significant role at ZCC-CT. The most sophisticated equipments in the world are installed in this area and high-above-average investments are issued. ZCC-CT is ISO certified. In order to meet this demand worldwide the highest requirements of know-how, personnel, machines and equipments are fulfilled.

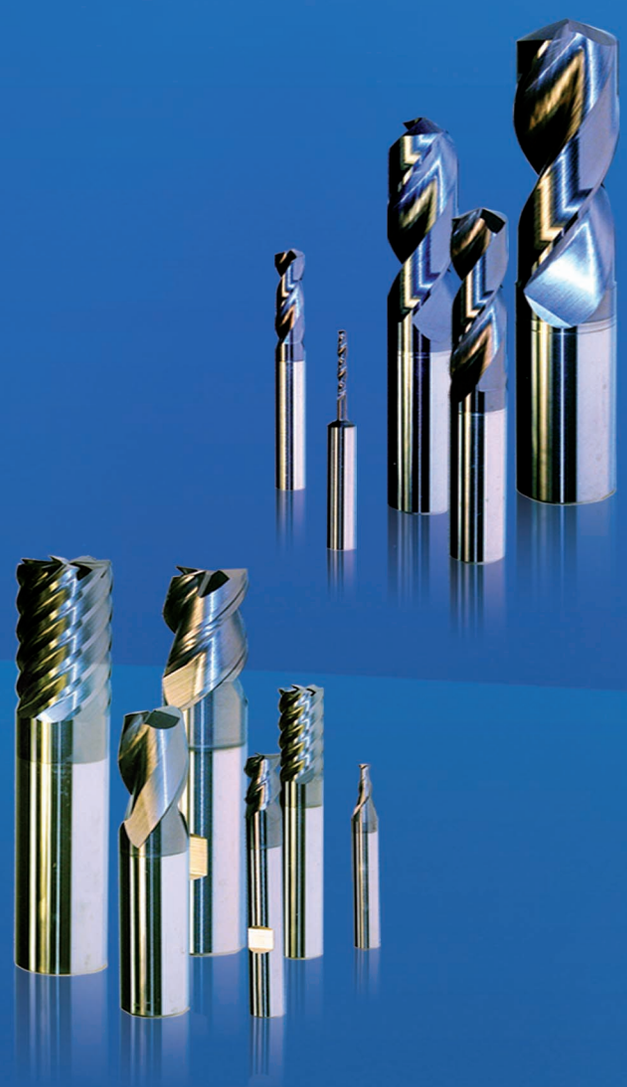
The whole program contains indexable inserts, toolholders, solid carbide tools, PCD, CBN and ceramics. The catalogue shows technical data, which are suggested for different applications. Those data are recommendations. Please be advised that the cutting data have to be applied properly in each case.




QUALITY MANAGEMENT SYSTEM
CERTIFICATE
Certificate No.: 00108Q11551R2L/4300
We hereby certify that
Zhuzhou Cemented Carbide Cutting Tools Co., Ltd.
Huanghe Southern Road, Hi-Tech Development Zone, Zhuzhou City, Hunan Province, P.R.China
by reason of its
Quality Management System
has been awarded this certificate for compliance with the standard
ISO9001: 2000
GB/T 19001-2000
The Quality Management System Applies in the following area:
Development, Production and Service of Cemented Carbide, Ceramic, Super Hard Material Indexable Inserts, Tips and Brazed Insert and Matched Toolholders, Solid Carbide Cutting Tools for Bore Machining, End Mills
Certified since: Dec. 18, 2002 Valid from: Jun. 10, 2008 Valid until: Jun. 09, 2011
Signed by: Li Huailin
CHINA QUALITY CERTIFICATION CENTRE


ISO14001
CERTIFICATE
Certificate No.: 0106E20454R1M/4300
We hereby certify that
Zhuzhou Cemented Carbide Cutting Tools Co., Ltd.
Huanghe Southern Road, High Technique and Development Zone, Zhuzhou, Hunan Province, China
by reason of its
Environmental Management System
has been awarded this certificate for compliance with the standard
ISO14001:2004
The Environmental Management System Applies in the following area:
Research, Design, Production, Service and Related Management Activities of Cemented Carbide, Ceramic, Super Hard Material Indexable Inserts, Tips and Brazed Insert and Matched Toolholders, Solid Carbide Cutting Tools for Bore Machining, End Mills
Date of issue: Jul. 25, 2006 Date of expiry: Jul. 24, 2009
Signed by: Li huailin
CHINA QUALITY CERTIFICATION CENTRE





Sales center in Europe
Vertriebszentrale in Europa:

ZCC Cutting Tools Europe GmbH

www.zccct-europe.com www.zccct.com
Heltorfer Straße 12 40472 Düsseldorf
Tel.: +49(0)211-989240-0
Fax: +49(0)211-989240-111
E-mail: Info@zccct-europe.com

Distributor
Vertretung



Россия
Trade Technology
Ordzhonikidze ul. d.11, str. 11
115419, Moscow (Russia)
Tel. +7 499 - 650 5031
Fax +7 495 - 650 5031
Web ➤ www.trte.ru