

UTILIS
multidec[®]
swiss type tools



*PRÄZISIONSWERKZEUGE FÜR DIE MIKROMECHANIK UND DIE MEDIZINALTECHNIK
OUTILS DE PRÉCISION POUR LA MICROMÉCANIQUE ET L'INDUSTRIE MÉDICALE
PRECISION TOOLS FOR THE MICROMECHANICAL AND MEDICAL INDUSTRY*

UTILIS[®]
Tooling for High Technology

DIE SPEZIALISTEN FÜR DIE SPANABHEBENDE PRODUKTION LES SPÉCIALISTES POUR L'ENLÈVEMENT DE COPEAUX EXPERTS FOR THE METAL CUTTING MANUFACTURING

Die Utilis AG ist ein Schweizer Unternehmen, das sich auf Werkzeuge der spanabhebenden Fertigungsprozesse spezialisiert hat. Dabei ist die Produktqualität ein strategischer Erfolgsfaktor für uns. Bei unseren Eigenprodukten ist deshalb die Einhaltung des ISO-zertifizierten Qualitäts-Managements Pflicht, ständige Innovation aber die Kür. Das ist unser Beitrag zum guten Ruf des Labels «Made in Switzerland». Klar, dass Handelsprodukte nur von den Herstellern verwendet werden, die vergleichbare Qualitätsansprüche erfüllen.

Kundenorientierung ist für Utilis kein leerer Begriff, sondern Tagesgeschäft. Der intensive Kontakt mit unseren Kunden ermöglicht einen regen Gedankenaustausch, was uns hilft, Bedürfnisse frühzeitig zu erkennen und uns mit entsprechenden Produkten darauf einzustellen.

Utilis SA est une société qui s'est spécialisée dans l'outillage destiné à l'industrie de l'enlèvement de copeaux. Pour cette raison et pour le succès de ceux-ci, la qualité de nos produits est un facteur stratégique de notre part. Nos produits sont fabriqués en conformité à l'exigence de la certification ISO. Le développement et l'innovation sont des défis quotidiens et ils nous permettent d'arborer le slogan «Swissmade». C'est également avec cette philosophie que les produits de revente choisis, ont été intégrés dans notre programme. La relation très étroite avec notre clientèle nous permet d'être, non seulement à l'écoute de celle-ci, mais également de répondre aux besoins du moment et à venir.

UTILIS is a Swiss company, specializing in tools for the metal cutting production process. The product quality is a significant part of our successful strategy. Fulfilling the Certificate ISO 9001:2000 requirements are extremely important to UTILIS, and constantly innovating new products is our voluntary exercise. With this philosophy we uphold the excellent reputation of «Made in Switzerland». It's obvious that the products we deal with are used by customers, who look to the same quality demands as UTILIS does. Looking after our clients is not just talking in platitudes for UTILIS, it is our daily business. Being in close contact with our customers allows an intensive exchange of ideas, which gives us the chance to recognize the demands of our customers early and gives us the focus to develop our product line for the future.

**Zertifikat**

Die SQS bescheinigt hiermit, dass nachstehend genanntes Unternehmen über ein Managementsystem verfügt, welches den Anforderungen der nachfolgend aufgeführten normativen Grundlage entspricht.

**Utilis AG**
CH-8555 Müllheim

Zertifizierter Bereich
Ganzes Unternehmen

Tätigkeitsgebiet
Produktion und Handel von Präzisionswerkzeugen

Normative Grundlage
ISO 9001:2008 Qualitätsmanagementsystem

Schweizerische Vereinigung für Qualitäts- und Managementsysteme SQS
Bürenstrasse 101, CH-1012 Zollikofen
Ausgabedatum: 11. April 2009

X. Zehner, Präsident SQS

Dieses SQS-Zertifikat hat Gültigkeit bis und mit 10. April 2012
Scope-Nummern 18, 29
Registrierungsnummer 11051

T. Zahner, Geschäftsführer SQS



**Certificat**

Par le présent certificat, la SQS atteste que l'entreprise désignée ci-après dispose d'un système de management répondant aux exigences de la base normative référencée ci-dessous.

**Utilis AG**
CH-8555 Müllheim

Domaine certifié
Toute l'entreprise

Sphère d'activité
Production et vente des outils de précision

Base normative
ISO 9001:2008 Système de management de la qualité

Association Suisse pour Systèmes de Qualité et de Management SQS
Bürenstrasse 101, CH-1012 Zollikofen
Date d'émission: 11 avril 2009

X. Zehner, Président du conseil SQS

Ce certificat SQS est valide jusqu'au 10 avril 2012
Numéros de scope 18, 29
Numéro d'enregistrement 11051

T. Zahner, Directeur SQS



**Certificate**

SQS herewith certifies that the company named below has a management system which meets the requirements of the normative base specified below.

**Utilis AG**
CH-8555 Müllheim

Certified area
Whole Company

Field of activity
Manufacturing and sale of precision tools

Normative base
ISO 9001:2008 Quality Management System

Swiss Association for Quality and Management Systems SQS
Bürenstrasse 101, CH-1012 Zollikofen
Issue date: April 11, 2009

X. Zehner, President SQS

This SQS Certificate is valid up to and including April 10, 2012
Scope numbers 18, 29
Registration number 11051

T. Zahner, Managing Director SQS



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MULTIDEC®-CUT	●	○	●					25
MULTIDEC®-ISO/TOP	●	●						91
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MULTIDEC®-EASY BORE		●	●					187
MULTIDEC®-SUPERBORE	○	●						215
MULTIDEC®-WHIRLING	○		●					229
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LEGENDE LÉGENDE LEGEND

Verschiedene Informationen zum Einsatz von Utilis-Multidec®-Werkzeugen beziehen sich auf bestimmte Bearbeitungsarten. Einfache Symbole informieren zusätzlich über das Produktesortiment und wo weitere Produkte bzw. technische Erläuterungen zu finden sind.

Dimensionen

Alle Masse sind in Millimeter (mm) angegeben; Zollmasse (Inch) sind entsprechend umgerechnet.

Einsatz-Empfehlung

- Bevorzugter Einsatz
- Möglicher Einsatz
- Einsatz nicht empfohlen

Bearbeitungsarten

- ▼ Schruppen
- ▼▼ Schlichten
- ▼▼▼ Feinschlichten

Produktesortiment

- Standard
- Semi Standard

Seiten-Hinweise

- 12... Siehe Seite 12 und folgende (Beispiel)

Kategorien der Werkstoffe

Verschiedene Informationen zum Einsatz von Utilis-Multidec-Werkzeugen beziehen sich auf bestimmte Werkstoffe. Zur besseren Übersicht sind dabei die zu bearbeitenden Werkstoffe im gesamten Katalog farblich gleich kategorisiert:

Stähle (unlegierte, niedrig legierte und hoch legierte)
Rostfreier Stahl
Titan und Titanlegierungen
NE-Metalle (Gold, Aluminium, Messing)

Les informations concernant l'utilisation des outillages Multidec®, dépendent du type d'usinage. Des symboles faciles à interpréter donnent des informations sur la gamme de produits ainsi que leurs applications principales.

Dimensions

Elles sont indiquées en millimètre (mm); les valeurs en (Inch) sont converties.

Conseils d'utilisations

- Emploi recommandé
- Emploi possible
- Emploi non recommandé

Types d'usages

- ▼ Ebauche
- ▼▼ Finition
- ▼▼▼ Super finition

Gamme de produits

- Standard
- Semi Standard

Références des pages

- 12... Voir page(s) 12 et suivantes (exemple)

Catégories des matières usinées

Informations importantes sur l'utilisation des outillages de coupe en fonction des matières à usiner. Pour une compréhension plus aisée, il existe une définition des matières à usiner par une couleur appropriée.

Aciers (non alliés, faiblement alliés, fortement alliés)
Aciers inoxydables
Le titane et alliages de titane
Les non ferreux (or, aluminium et laiton)

Different information about application refer to certain machining methods. In addition, simple symbols inform of the product assortment and where additional products and technical information can be found.

Dimensions

All dimensions are in millimeter (mm); native dimensions in inch are calculated into millimeter.

Recommended usage

- Preferred application
- Possible application
- Application not recommended

Machining method

- ▼ Roughing
- ▼▼ Finishing
- ▼▼▼ Micro finishing

Range of products

- Standard
- Semi Standard

Page information

- 12... See page 12 and the following (example)

Categorization of materials

Different information about application refer to certain materials. For better overview through the whole catalogue each group of material is defined by one color.

Steel (non-alloyed, low alloyed and high alloyed)
Stainless steel
Titanium and Ti-alloys
Non ferrous metals (Gold, Aluminium and Brass)

Bestell-Bezeichnung

Zur Bezeichnung des gewählten Produkttyps muss die gewünschte Schneidstoffsorte zugefügt werden. Ergänzende Informationen zu den Sorten hierzu sind gemäss Seitenhinweis (□ ...) zu finden.

Désignation pour la commande

Lors de la commande il est nécessaire de choisir la nuance carbure qui convient pour votre application, ainsi que l'éventuel revêtement à y apporter. Vous trouvez des informations selon l'indication (□ ...).

Part code

To the designation of the selected type of product, the desired cutting material code must be added. Supplementing information to the grades can be found according to the page references (□ ...).

Bezeichnung Désignation Designation		Hartmetall Carbure Carbide □ 36		
		●	●	●
		○	○	●
		○	—	●
		●	○	○
Typ 02				
L Linke Ausführung Exécution gauche Left execution	R Rechte Ausführung Exécution droite Right execution	UHM 30 ...	UHM 30 SX ...	UHM 30 HX ...
1602-0.5-2.5-20 L	1602-0.5-2.5-20 R	■		■
1602-0.8-5 L	1602-0.8-5 R	■		■
1602-1.0-5 L	1602-1.0-5 R	■		■

Beispiel | Exemple | Example: 1602-0.5-2.5-20 L UHM 30

Ausführung Halter/Wendeschneidplatte

Ob ein Halter als «links» oder «rechts» definiert ist, bestimmt die Seite an der die Wendeschneidplatte sitzt. Dabei ist der Halter mit der Schneide zur Person hin zu halten.

Linker Halter
Outil à gauche
Left hand holder

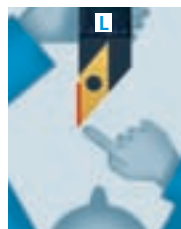


Neutraler Halter
Outil neutre
Neutral holder


Exécution de porte-outil/plaquette

La reconnaissance des outillages se pratique de la manière indiquée sur le dessin ci-dessous, c'est-à-dire l'outil vu de dessus, la plaquette contre soi.

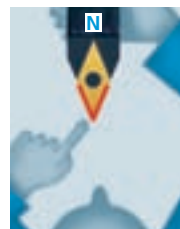
Rechter Halter
Outil à droite
Right hand holder



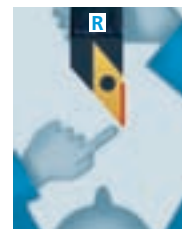
Linke Schneide
Plaquette à gauche
Left insert

Execution of holder/insert

The side on which the insert is located defines if it is a left or right hand holder. While doing so the holder with the insert has to be pointed towards the person.



Neutrale Schneide
Plaquette neutre
Neutral insert



Rechte Schneide
Plaquette à droite
Right insert

Verpackungsangaben

Die Etiketten der Produkte dienen nicht nur der klaren Kennzeichnung des Inhaltes sondern liefern auch noch den Hinweis, für welche Werkstoffe die Schneiden eingesetzt werden können. Dazu benutzt Utilis die ISO-Kodierungsreihe.

Auf den Etiketten von Utilis-Eigenprodukten (Multidec®) wird die Utilis-Artikelnummer generell zusätzlich als Barcode aufgedruckt.

Information sur les emballages

Les étiquettes des produits servent non seulement à l'identification du contenu, mais aussi pour quels matériaux à usiner ils sont destinés. Le code ISO est utilisé.

Sur l'emballage des produits Utilis (Multidec®), le numéro d'article Utilis est imprimé ainsi qu'un code barres.

Packaging Information

The labels of our products show the clear content of the packaging and reveal the clue in what material the cutting insert can be used. This information is shown by using the ISO encoding rank.

On the packaging of Utilis products (Multidec®) the article number Utilis is printed generally in addition as a barcode.

UTILIS multidec swiss type tools

Article no. 121114
VPGT 1003008 FL TOP UHM30 HX

Article no. 137212
3002 - 1.50 - 8L SC UHM30 HX

P456321

Barcode | Code barres | Barcode (DataMatrix)

Produktionsnummer | Numéro de production | Production number

Utilis AG, www.utilis.com, +41 52 762 62 62

Harte Werkstoffe | Matières dur | Hard materials
Titan | Titane | Titanium
NE-Metall | Les non ferreux | Non ferrous metals
Eisenguss | Fonte de fer | Cast iron
Rostfreier Stahl | Acier inoxydable | Stainless steel
Stahl | Acier | Steel

Einsatz-Empfehlung | Conseils d'utilisations | Recommended usage 4

UTILIS.COM-SHOP

Über den Shop von [utilis.com](https://www.utilis.com) können alle Artikel durch Eingabe der jeweiligen Bezeichnung aus diesem Katalog gefunden und über den Warenkorb bestellt werden.

Dans le shop [utilis.com](https://www.utilis.com), tous les articles de nos catalogues peuvent être trouvés et directement commandés en y entrant leurs désignations, via le «panier».

With our shop [utilis.com](https://www.utilis.com), all items can be found and ordered with entering the product designation from this catalog.



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VERGLEICH DER STANDARD-HÄRTEWERTE

TABLEAU DE COMPARAISONS ENTRE LA RÉSISTANCE À LA TRACTION ET LA DURETÉ

COMPARISON OF DEFAULT HARDNESS VALUES

Zugfestigkeit (N/mm ²) Résistance à la traction (N/mm ²) Tensile strength (N/mm ²)	Vickers HV	Brinell HB	Rockwell HRC	Shore C
700	200	200	—	28
740	210	210	—	29
770	220	220	—	30
810	230	230	19.2	31
840	240	240	21.2	33
880	250	250	23	34
910	260	260	24.7	35
950	270	270	26.1	36
980	280	280	27.6	37
1020	290	290	29	39
1050	300	300	30.3	40
1090	310	310	31.5	41
1120	320	320	32.9	42
1150	330	330	33.8	43
1190	340	340	34.9	44
1230	350	350	36	45
1260	360	359	37	46
1300	370	368	38	47
1330	380	373	38.9	48
1370	390	385	39.8	49
1400	400	393	40.7	50
1440	410	400	41.5	51
1470	420	407	42.3	52
1510	430	416	43.2	53
1540	440	423	44	54
1580	450	429	44.8	55
1610	460	435	45.5	56
1650	470	441	46.3	57
1680	480	450	47	58
1720	490	457	47.7	59
1750	500	465	48.3	60
1790	510	474	49	61
1820	520	482	49.6	62
1860	530	489	50.3	63
1890	540	496	50.9	64
1930	550	503	51.5	65
1960	560	511	52.1	66
2000	570	520	52.7	67
2030	580	527	53.3	68
2070	590	533	53.8	69
2100	600	533	54.4	70
2140	610	543	54.9	71
2170	620	549	55.4	72
2210	630	555	55.9	73
2240	640	561	56.4	74
2280	650	568	56.9	75
2310	660	574	57.4	75
2350	670	581	57.9	76
2380	680	588	58.7	77
2410	690	595	58.9	78
2450	700	602	59.3	79
2480	710	609	59.8	80
2520	720	616	60.2	81
2550	730	622	60.7	82
2590	740	627	61.1	83
2630	750	633	61.5	83
2660	760	639	61.9	84
2700	770	644	62.3	85
2730	780	650	62.7	86
2770	790	656	63.1	86
2800	800	661	63.5	87
2840	810	666	63.9	87
2870	820	670	64.3	88
2910	830	677	64.6	89
2940	840	682	65	89
2980	850	—	65.3	90
3010	860	—	65.7	90

Zugfestigkeit (N/mm ²) Résistance à la traction (N/mm ²) Tensile strength (N/mm ²)	Vickers HV	Brinell HB	Rockwell HRC	Shore C
3050	870	—	66	91
3080	880	—	66.3	91
3120	890	—	66.6	92
3150	900	—	66.9	92
3190	910	—	67.2	—
3220	920	—	67.5	—
3260	930	—	67.7	—
3290	940	—	68	—

KATEGORISIERUNG DER WERKSTOFFE CLASSIFICATION DES MATÉRIAUX CATEGORIZATION OF MATERIALS

Stähle (unlegierte, niedrig legierte und hoch legierte)
Aciers (non alliés, faiblement alliés, fortement alliés)
Steel (non-alloyed, low alloyed and high alloyed)

Werkstoff-Nr. Numéro du matériau Material number	Normen Normes Specifications					Härte Dureté Hardness (HB)	Kategorie Catégorie Category
	DIN	ISO	AFNOR	AISI/SAE/ASTM	JIS		
1.0401	C 15		C 18, AF3 7 C 12, XC 18	1015, 1016, 11017	S 15 C	98–178	I
1.0402	C 22		AF 42 C 20, 1 C 22, XC 25	1020, 1023	S 20 C, S 33 C	–	I
1.0501	C 35		C 35, 1 C 35, AF 55 C35, XC 38	1035	S 35 C, S 35 CM	–	I
1.0503	C 45		C 45, 1 C 45, AF 65 C 45	1045, 1043	S 45 C, S 45 CM	–	I
1.0535	C 55		C 54, 1 C 55, AF 70 C 55	1055	S 55 C, 1 C 55	–255	I
1.0601	C 60		C 60, 1 C 60, AF 70 C 55	1060	S 58 C	–255	I
1.0715	11 SMn 30, 9 SMn 28	11 SMn 28	S 250	1213	SUM 22	107–169	I
1.0718	11 SMn 30, 9 SMn Pb 28	11 SMn Pb 28	S 250 Pb	12 L 13	SUM 22 L, SUM 23 L, SUM 24 L	–	I
1.0722	10 SPb 20		10 PbF 2	11 L 08	–	–	I
1.0726	35 S 20		35 MF 6	1140	–	–	I
1.0736	11 SMn 37, 9 SMn 36		S 300	1215	SUM 25	–	I
1.0737	11 SMn Pb 37, 9 SMn Pb 36	11 SMn Pb 35	S 300 Pb	12 L 14	–	–	I
1.0904	55 Si 7		–	9255	–	235–290	II
1.0961	60 SiCr 7		–	9262	–	245–310	II
1.1141	C 15 E, Ck 15		XC 12, XC 15, XC 18	1015	S 15, S 15 CK	135–143	I
1.1157	40 Mn 4		35 M 5, 40 M 5	1039	–	–	I
1.1167	36 Mn 5		35 M 5, 40 M 5	1335, 1541	SMn 438, SCMn 3	–217	I
1.1170	28 Mn 6		20 M 5, 28 Mn 6	1330	SCMn 1	223–255	I
1.1183	Cf 35		XC 38 H 1 TS	1035	S 35 C, S 35 CM	–	I
1.1191	C 45 E, Ck 45		C 45, 2 C 45, XC 42 H1, XC 45	1042, 1045	S 45 C, S 45 CM	207–255	I
1.1203	C 55 E, Ck 55		2 C 55, XC 55 H1, XC 54	1055	S 55 C, S 55 CM	229–255	I
1.1213	Cf 53		XC 48 H 1 TS	1050, 1055	S 50 C, S 50 CM	–	I
1.1221	Ck 60		C 60, 2 C 60, XC 60	1064	S 58 C, S 60 CM, S 65 CM	241–255	I
1.1274	C 100 S, Ck 101		C 100, XC 100	1095	SUP 4, SK 4 CSP	–	I
1.1545	C 105 U, C 105 W 1		Y1 105	W 110	SK 3	190	I
1.1663	C 125 W		Y2 120	W 112	–	–	I
1.2067	102 Cr 6, 100 Cr 6		Y 100 C 6	L 3	SUJ 2	–	II
1.2080	X 210 Cr 12		Z 200 C 12	D 3	SKD 1	–225	III
1.2210	115 CrV 3		–	L 2	–	–250	III
1.2344	X 40 CrMoV 5–1		Z 40 CDV 5	H 13	SKD 61	–229	III
1.2363	X 100 CrMoV 5–1		Z 100 CDV 5	A 2	SKD 12	–241	III
1.2419	105 WCr 6		105 WCr 5, 105 Wc 13	–	SKS 2, SKS 3, SKS31	–	II
1.2436	X 210 CrW 12		Z 210 CW 12–01	–	–	–250	III
1.2516	120 WvV 4		–	F 1	–	–	III
1.2542	45 WCrV 7		45 WCrV 8, 45 WCV 20	S 1	–	–	II
1.2581	X 30 WCrV 9–3		Z 30 WCV 9	H 21	SKD 5	–	III
1.2601	X 165 CrMoV 12		–	H 12	–	–	III
1.2713	55 NiCrMoV 6		55 NiCrMoV 7, 55 NCDV 7	L 6	SKT 4	–	II
1.3243	HS 6–5–2–5		Z 85 WDKCV 06–05–05–04–02	–	SKH 55	–269	II
1.3255	HS 18–1–2–5		Z 80 WKCV 18–05–04–01	T 4	SKH 3	–265	II
1.3343	HS 6–5–2		Z 85 WDCV 06–05–04–02	M 2	SKH 51	–280	II
1.3348	HS 2–9–2		Z 100 DCWV 09–04–02–02	M 7	–	–	II
1.3355	HS 18–0–1		Z 80 WCV 18–04–01	T 1	SKH 2	–269	II
1.3505	100 Cr 6		–	52100	SUJ 2, SUJ 4	–207	III
1.4718	G-X 45 CrSi 9 3		Z 45 CS 9	HNV 3	–	–250	III
1.5120	38 MnSi 4		–	–	–	–	I, II
1.5415	16 Mo 3, 15 Mo 3		15 D 3	A 204 Gr. A	STBA 12, STFA 12, STPA 12	–	II
1.5423	16 Mo 5		–	4419, 4520	SB 450 M, SB 480 M	–	II
1.5622	14 Ni 6		16 N 6	A 203	–	–	II
1.5680	X 12 Ni 5, 12 Ni 19		Z 18 N 5, 5 Ni, Z 10 N 05	2515, 2517	SL 5 N 590	–	III
1.5710	36 NiCr 6		–	3135	–	–	I, II
1.5732	14 NiCr 10		15 NC 11, 16 NC 11	3415	SNC 415	–	II
1.5752	15 NiCr 13, 14 NiCr 14		12 NC 15, 14 NC 12, 13 NiCr 14	3310; 3312, 3316	SNC 815	–255	II
1.6511	36 CrNiMo 4		35 NCD 5, 40 NCD 3	9840	–	–250	II
1.6523	20 NiCrMo 2–2, 21 NiCrMo 2		20 NCD 2, 22 NCD 2	8615, 8617, 8620	SNCM 220	–212	II
1.6546	40 NiCrMo 2–2		40 NCD 2	8640, 8740	SNCM 240	–	II
1.6582	34 CrNiMo 6		35 NCD 6	4337, 4340	SNCM 447	–248	II
1.6587	18 CrNiMo7–6, 17 CrNiMo 6		18 NCD 6	–	–	159–207	II

KATEGORISIERUNG DER WERKSTOFFE

CLASSIFICATION DES MATÉRIAUX

CATEGORIZATION OF MATERIALS

Stähle (unlegierte, niedrig legierte und hoch legierte)
Aciers (non alliés, faiblement alliés, fortement alliés)
Steel (non-alloyed, low alloyed and high alloyed)

Werkstoff-Nr. Numéro du matériau Material number	Normen Normes Specifications					Härte Dureté Hardness (HB)	Kategorie Catégorie Category
	DIN	ISO	AFNOR	AISI/SAE/ASTM	JIS		
1.6657	14 NiCrMo 13–4		16 NCD 13	9310	–	–	II
1.7015	15 Cr 3		12 C 3, 15 Cr 2, 18 C 3	5015	SCr 415	–174	II
1.7033	34 Cr 4		32 C 4, 34 Cr 4	5132	SCr 430	–255	II
1.7035	41 Cr 4		41 Cr 4, 42 C 4	5140	SCr 440	–255	II
1.7045	42 Cr 4		42 C 4 TS	5140	SCr 440	–255	II
1.7103	67 SiCr 5		67 SiCr 5	9254	–	–	II
1.7131	16 MnCr 5		16 MC 5, 16 MnCr 5	5115	–	–207	II
1.7139	16 MnCrS 5		16 MnCrS 5	5115	–	–207	II
1.7176	55 Cr 3		55 C 3	5155	SUP 9	–280	II
1.7218	25 CrMo 4		25 CD 4	4130	SCM 420, SCM 430	–255	II
1.7220	34 CrMo 4		34 CD 4	4130, 4135, 4137	SCM 432, SCM 435 H, SCCrM 3	–255	II
1.7223	41 CrMo 4		42 CD 4 TS	4142	SNB 22, SCM 440	–	II
1.7225	42 CrMo 4		42 CD 4	4140, 4142	SCM 440, SNB 7	–255	II
1.7262	15 CrMo 5		12 CD 4	–	SCM 415	–	II
1.7335	13 CrMo 4-5, 13 CrMo 4-4		15 CD 4.05	A 182–F11, F12	SFVA F 12, STBA 20, STBA 22	–	II
1.7361	32 CrMo 12		30 CD 12	–	–	–	II
1.7380	12 CrMo 9–10		12 CD 9–10, 10 CD 9.10	A 182–F22	SFVA F 22 A/ B, SCMV 4, SCPH 32-CF	–	II
1.7715	14 MoV 6-3		14 Mo 6	K11591	–	–	II
1.8159	50 CrV 4		51 CV 4, 50 CV 4, 51 CrV 4	6150	SUP 10	–248	II
1.8161	58 CrV 4		–	–	–	–255	II
1.8509	41 CrAlMo 7–10		40 CAD 6.12	E 7140	SACM 1, SACM 645	–255	II
1.8523	40 CrMoV 13–9, 39 CrMoV 13 9		–	–	–	–	II

KATEGORISIERUNG DER WERKSTOFFE CLASSIFICATION DES MATÉRIAUX CATEGORIZATION OF MATERIALS

Rostfreier Stahl Aciers inoxydables Stainless steel							
Werkstoff-Nr. Numéro du matériau Material number	Normen Normes Specifications					Härte Dureté Hardness (HB)	Kategorie Catégorie Category
	DIN	ISO	AFNOR	AISI/SAE/ASTM	JIS		
1.4000	X 6 Cr 13		Z 8 C 12	403	SUS 403	–200	V
1.4001	X 7 Cr 14		Z 8 C 13 FF	410 S	SUS 410 S	130–180	V
1.4005	X 12 CrS 13		X 12 CrS 13	416	SUS 416	–220	V
1.4006	X 12 Cr 13		Z 10 C 13	410, CA–15	SUS 410	–220	V
1.4016	X 6 Cr 17		Z 8 C 17	430	SUS 430	240	VI
1.4027	GX 20 Cr 14		Z 20 C 13 M	–	SCS 2	170–240	V, VI
1.4034	X 46 Cr 13		Z 44 C 14	420	SUS 420	–245	VI
1.4057	X 17 CrNi 16–2		Z 15 CN 16–02	431	SUS 431	–295	VI
1.4104	X 12 CrMoS 17		Z 10 CF 17	430 F	SUS 430 F	–220	V
1.4105	X 6 CrMoS 17		Z 8 CF 17	430 FR	–	–200	V
1.4112	X 90 CrMoV 18		X 90 CrMoV 18	440 B	SUS 44 B	–255	V
1.4113	X 6 CrMo 17–1		Z 8 CD 17–01	434	SUS 434	–200	V
1.4125	X 105 CrMo 17		Z 100 CD 17	440 C	SUS 440 C	–255	V
1.4301	X 5 CrNi 18–10		Z 6 CN 18–10	304, 304 H	SUS 304	–215	V
1.4305	X 8 CrNiS 18–9	X 10 CrNiS 18–9	Z 8 CNF 18–09	303	SUS 303	–230	V
1.4306	X 2 CrNi 19–11	X 2 CrNi 19–11	Z 3 CN 19–11	304 L	SUS 304 L, SCS 19	–215	V
1.4308	X 6 CrNi 18–9		Z 6 CN 18.10 M	CF–8	SCS 13	130–200	V
1.4310	X 10 CrNi 18–8, X 12 CrNi 17–7	X 10 CrNi 19–8	Z 11 CN 18–08, Z 12 CN 18–09	301, 302	SUS 301	–230	V
1.4311	X 2 CrNiN 18–10		Z 3 CN 18–10 Az	304 LN	SUS 304 LN	–230	V
1.4313	X 3 CrNi 13–4		Z 4 CND 13.4, Z 6 CN 13–4	CA 6–NM	SCS 5	–320	VI
1.4317	GX 4 CrNi 13–4		Z 8 CD 17–1	CA 6–NM	SCS 6	230–350	VI
1.4401	X 5 CrNiMo 18–10		Z 6 CND 17–11	316	SUS 316	–215	V
1.4404	X 2 CrNiMo 17–12–2+5+Cu		Z3CND17–11–02, Z3CND 17–12–02	316 L	SUS 316 F	–215	V
1.4408	X 6 CrNiMo 18–10		–	CF–8M	SCS 14	130–200	V
1.4427			–	316 L	SUS 316 F	–	V
1.4429	X 2 CrNiMoN 17–13–3		Z 2 CND 17–13 Az	316 LN	SUS 316 LN	–250	VI
1.4435	X 2 CrNiMo 18–14–3		Z 3 CND 18–14–03	316 L	SUS 316 L, SCS 16	–215	V
1.4436	X 5 CrNiMo 17–13–3		Z 6 CND 18–12–03	316	SUS 316	–215	V
1.4438	X 2 CrNiMo 18–15–4		Z 2 CND 19–15–04, Z 2 CND 19–15–04	317L	SUS 317L	–215	V
1.4441	X 2 CrNiMo 18 15 3	5832–1	–	316 LVM, F 138	SUS 316	–	V
1.4452	X 13 CrMnMoN 18–14–3		–	–	–	–	V
1.4460	X 3 CrNiMo 27–5–2		Z 5 CND 27–05 Az	329	SUS 329 J 1, SCS 11, SCH 11	–260	VI
1.4539	X 1 NiCrMoCu 25–20–5		Z 2 NCDU 25–20	904 L	–	–230	VI
1.4541	X 6 CrNiTi 18–10		Z 6 CNT 18–10	321	SUS 321	–215	VI
1.4542	X 5 CrNiCuNb 16–4		X 5 CrNiCuNb 16–4	630, 17–4 PH	SCS 24, SUS 630	–360	VI
1.4550	X 6 CrNiNb 18–10		Z 6 CNNb 18–10	347, 348	SUS 347	–230	V, VI
1.4571	X 6 CrNiMoTi 17–12–2		Z 6 CNDT 17–12	316 Ti	SUS 316 Ti	–215	V
1.4581	GX 5 CrNiMoNb 19–11–2		Z 4 CNDNb 18.12 M	–	SCS 22	130–200	V
1.4583	X 10 CrNiMoNb 18–12		–	318	–	130–220	V
1.4718	X 45 CrSi 9–3		Z 45 CS 9	HNV 3	SUH 1	–	
1.4724	X 10 CrAl 13		Z 13 C 13	405	SUS 405	–192	V
1.4742	X 10 CrAl 18		Z 12 CAS 18	430	SUH 21, SUS 430	–212	V
1.4757	X 80 CrNiSi 20		–	HNV6	SUH 4	–	
1.4762	X 10 CrAl 24		Z 12 CAS 25	446	SUH 446	–	
1.4828	X 15 CrNiSi 20–12		Z 9 CN 24–13, Z17 CNS 20–12	309	SUH 309	–223	V
1.4845	X 8 CrNi 25–21, X 12 CrNi 25–21		Z 8 CN 25–20, Z 12 CN 25–20	310 S	SUH 310, SUS 310 S	–	VI
1.4864	X 12 NiCrSi 35–16, X 12 NiCrSi 36–16		Z 20 NCS 33–16	330	SUH 330	–	VI
1.4865	GX 40 NiCrSi 38–19, GX 40 NiCrSi 38–18		–	–	SCH 15, SCH 16	–	VI
1.4871	X 53 CrMnNiN 21–9		Z 52 CMN 21–09 Az	EV 8	SUH 35, SUH 36	–	V
1.4878	X 12 CrNiTi 18–9		Z 6 CNT 18–10	321	SUS 321	215	V

KATEGORISIERUNG DER WERKSTOFFE

CLASSIFICATION DES MATÉRIAUX

CATEGORIZATION OF MATERIALS

Titan und Titanlegierungen
Le Titane et alliages de titane
Titanium and Ti-alloys

Werkstoff-Nr. Numéro du matériau Material number	Normen Normes Specifications					Härte Dureté Hardness (HB)	Kategorie Catégorie Category
	DIN	ISO	AFNOR	AISI/SAE/ASTM	JIS		
3.7025	Ti (Grade 1)	5832-2	T35	B 348, F67	KS-40	~120	IV
3.7035	Ti 2 (Grade 2)	5832-2	T40	B 348/265, F 67	KS-50	~150	IV
3.7055	Ti 3 (Grade 3)	5832-2	T50	F67	KS-70	~170	IV
3.7065	Ti 4 (Grade 4)	5832-2	T60	B 348/265, F 67	KS-85	~200	IV
3.7115	Ti Al 2.5 5n (Grade 6)			B 348/TA 5E	KS-115 AS		IV
3.7134	TiCu 2			B 348, F 67		<260	IV
3.7164	TiAl8Mo1V1						IV
3.7165	Ti Al 6 V 4 (Grade 5)	5832-3	T-A 6 V	B 348	KS-130 AV	~310	IV
3.7235	Ti 2 Pd (Grade 7)			B 348/F 67		~150	IV
3.7194	Ti 3 Al 2.5V (Grade 9)			B 348	KS-50 Pd		IV
3.7225	Ti 7 (Grade 7)					~150	IV
3.7235	Ti 1 Pd, TiAl 6 Nb 7 (Ti 6 Al 7Nb)	5832-11		F1295		~120	IV

KATEGORISIERUNG DER WERKSTOFFE CLASSIFICATION DES MATÉRIAUX CATEGORIZATION OF MATERIALS

13

UTILIS
multidec
swiss type tools

NE-Metalle (Aluminium) Les non ferreux (aluminium) Non ferrous metals (aluminium)							
Werkstoff-Nr. Numéro du matériau Material number	Normen Normes Specifications					Härte Dureté Hardness (HB)	Kategorie Catégorie Category
	DIN	ISO	AFNOR	AISI/SAE/ASTM	JIS		
2.1871	G-AlCu 4 TiMg						VII
3.0205	AL99						VII
3.0255	Al99.5			1000			VII
3.1325	AlCuMg1						VII
3.1655	AlCuSiPb						VII
3.1754	G-AlCu5Ni1.5						VII
3.2163	G-AlSi9Cu3						VII
3.2315	AlMgSi1						VII
3.2371	G-AlSi 7 Mg			4218 B			VII
3.2373	G-AlSi 9 Mg						VII
3.2381	G-AlSi 10 Mg						VII
3.2382	GD-AlSi 10 Mg						VII
3.2383	GK-AlSi 10 Mg (Cu)			A 360.2			VII
3.2581	G-AlSi 12			A 413.2			VII
3.2582	GD-AlSi 12			A 413.0			VII
3.2583	G-AlSi 12 (Cu)			A 413.1			VII
3.3315	AlMg1						VII
3.3561	G-AlMg 5						VII
3.4345	AlZnMgCu 0.5			7050			VII
3.5101	G-MgZn 4 SE 1 Zr 1			ZE 41			VII
3.5103	MgSE3Zn 2 Zr 1			EZ 33			VII
3.5106	G-MgAg 3 SE 2 Zr 1			QE 22			VII
3.5812	G-MgAl 8 Zn 1			AZ 81			VII
3.5912	G-MgAl 9 Zn 1			AZ 91			VII

NE-Metalle (Messing) Les non ferreux (laiton) Non ferrous metals (brass)							
Werkstoff-Nr. Numéro du matériau Material number	Normen Normes Specifications					Härte Dureté Hardness (HB)	Kategorie Catégorie Category
	DIN	ISO	AFNOR	AISI/SAE/ASTM	JIS		
2.0220	CuZn 5					65–110	VIII
2.0230	CuZn 10					75–130	VIII
2.0240	CuZn 15					65–145	VIII
2.0250	CuZn 20					65–150	VIII
2.0265	CuZn 30					70–165	VIII
2.0321	CuZn 37					70–180	VIII
2.0360	CuZn 40					95–120	VIII
2.0371	CuZn 38 Pb 2					80–160	VIII
2.0375	CuZn 36 Pb 3					80–155	VIII
2.0380	CuZn 39 Pb 2					95–150	VIII
2.0401	CuZn 39 Pb 3			C 38500	C3603	80–145	VIII
2.0402	CuZn 40 Pb 2					80–145	VIII
	CuZn 40 Pb 3						VIII
2.0410	CuZn 44 Pb 2						VIII
2.0490	CuZn 31 Si					<180	VIII
2.0540	CuZn 35 Ni						VIII
2.0550	CuZn 40 Al 2						VIII
2.0572	CuZn 40 Mn 2 Fe 1						VIII
2.0771	CuNi 7 Zn 39 Mn 5 Pb 3					130–200	VIII

EIGENSCHAFTEN UND ANWENDUNGSBEREICHE DER BESCHICHTUNGSTYPEN

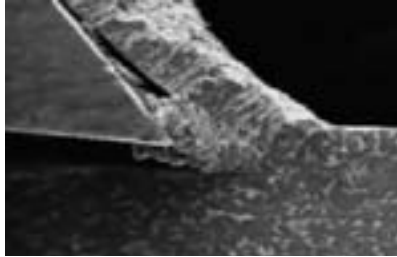
CARACTÉRISTIQUES ET UTILISATIONS DES DIFFÉRENTS REVÊTEMENTS

PROPERTIES AND APPLICATION RANGE OF DIFFERENT COATINGS

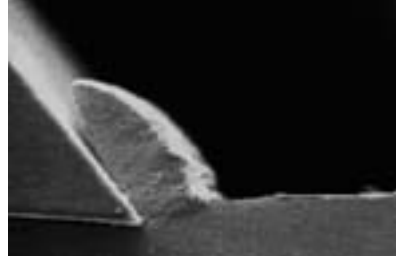
Durch die Veredlung von Schneiden mit einer zusätzlichen Hartstoffschicht wird die Verschleissbildung entscheidend reduziert. Sowohl Reibung und Erwärmung, aber auch Oxidation sowie Diffusion vermindern sich signifikant.

Les revêtements contribuent considérablement à la durée de vie des outils, grâce à leur grande dureté, leur résistance à la chaleur et leur faible coefficient de frottement.

With the refinement of cutting tools with an additional coating the wear becomes decisively reduced. Rubbing, warming up, diffusion and oxidation decreases significantly.



Zerspanungsprozess mit unbeschichteter Schneide
 Usinage avec outil non revêtu
 Cutting process without coated tool



Zerspanungsprozess mit beschichteter Schneide
 Usinage avec outil revêtu
 Cutting process with coated tool

Kantenverrundung bei beschichteten Schneiden

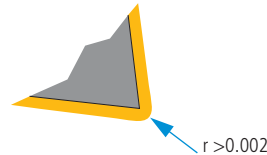
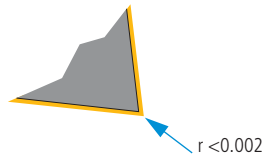
Jede Veredelung von Hartmetallschneiden mit einer Hartstoffschicht hat eine Kantenverrundung zur Folge. Je kleiner der Werkstoffdurchmesser ist, desto bedeutsamer wirkt sich dieser Effekt in der Zerspanung aus. Dabei hängt der Grad der Kantenverrundung von der Dicke der Beschichtung ab: Je dicker die Schicht, desto grösser die Kantenverrundung.

Diminution de l'acuité d'arête de coupe

Chaque revêtement provoque une diminution de l'acuité de l'arête. Celle-ci se traduit par un arrondissement de l'arête. Plus le diamètre à usiner est petit, plus l'arête doit être franche. L'arrondissement de l'arête de coupe est lié à l'épaisseur du revêtement: Plus épaisse la couche, plus grand devient l'arrondissement.

Rounded edges among coated inserts

Every coating of a carbide insert results in a rounded cutting edge. The smaller the diameter of the material to be cut, the more significant are the consequences in the cutting performance. Therefore the rounding off of the cutting edge depends on the thickness of the coated layer. As thicker the coating, as greater is the radius created along the cutting edge.



EIGENSCHAFTEN UND ANWENDUNGSBEREICHE DER BESCHICHTUNGSTYPEN

CARACTÉRISTIQUES ET UTILISATIONS DES DIFFÉRENTS REVÊTEMENTS

PROPERTIES AND APPLICATION RANGE OF DIFFERENT COATINGS

15

UTILIS
multidec
swiss type tools

Hartmetall Carbure Carbide	unbeschichtet non revêtu uncoated	Standard-Beschichtungen Revêtements standard Standard coatings			Sonder-Beschichtungen (auf Anfrage) Revêtements spéciaux (sur demande) Special coatings (on demand)						
UTILIS-Code		SX	MZ	HX	HX-A	HPX	TX	HLX	BX	DX-T	DX
Beschichtung Revêtement Coating	—	TiN	TiN	TiAlN	AlCrN	TiAlN	AlCrN	TiAlN WC/C	TiCN	DLC	Diamond
Schichtdicke Épaisseur Thickness (µm)	—	2–5	12–18	1–3	1–4	2–4	1–3	3–5	1–4	1–3	6–12
Härte Dureté Hardness value (HV 0.05)	1500	2300	2300	3000	3200	3300	3300	3000	3000	2500	10'000
Max. Anwendungstemperatur Température maximale d'utilisation Max. application temperature (°C)	~ 400	~ 600	~ 700	~ 900	~ 1100	~ 950	~ 1100	800	400	350	600
Schichtfarbe Couleur de la couche Coating Colour	—	gold or gold	gold or gold	violett violet violet	violett violet violet	grau gris grey	violett violet violet	dunkelgrau gris foncé dark grey	grau gris grey	schwarz noir black	grau gris grey
Beschichtungsverfahren Procédé de revêtement Coating process	—	PVD	CVD	PVD	PVD	PVD	PVD	PVD	PVD	PVD	CVD

Werkstoffe (Kategorie) Matières (Catégorie) Materials (Category)											
Stahl unlegiert (I) Acier non allié Steel non-alloyed	●	●	●	●	●	●	○	—	●	—	—
Stahl niedriglegiert (II) Acier faibl. allié Steel low alloyed	○	●	●	●	●	●	●	—	●	—	—
Stahl hochlegiert (III) Acier fortem. allié Steel high alloyed	○	○	●	●	●	●	○	—	○	—	—
Rostfreier Stahl (V) Acier inoxydable Stainless steel	○	○	●	●	●	●	○	●	●	○	—
Rostfreier Stahl (VI) Acier inoxydable Stainless steel	○	○	●	●	●	●	○	●	○	○	—
Titan (IV) Titane Titanium	○	—	—	●	●	●	●	●	—	—	—
Aluminium (VII) Aluminium Aluminium	●	○	—	●	○	—	—	●	—	●	●
Messing (VIII) Laiton Brass	●	○	—	●	○	○	—	●	—	●	—
Kunststoff/Harz Plastique/résine Synthetics/resin	●	—	—	—	—	—	—	—	—	○	—
Kunststoff verstärkt/Komposite Plastique renforcée/composite Synthetics reinforced/composits	—	—	—	○	—	—	—	—	—	●	●
Harte Werkstoffe Matières dure Hard materials	—	—	—	—	○	—	○	—	—	—	—

Für die Bestimmung der Oberflächengüten sind Messgrößen nach DIN-ISO definiert. Im Einzelnen sind das:

- Einzelrautiefe $Z_1 \dots Z_5$
Das ist der senkrechte Abstand zwischen höchstem und tiefstem Punkt des Rauheitsprofils R innerhalb einer Einzelmessstrecke l_e .
- Gemittelte Rautiefe R_z (DIN 4768)
Das ist der Mittelwert aus den Einzelrautiefen von 5 aufeinander folgenden Einzelmessstrecken l_e .
- Mittenrauwert R_a (DIN 4768)
Das ist der arithmetische Mittelwert aller Beträge des Rauheitsprofils R innerhalb der Gesamtmessstrecke l_m .
- Maximale Rautiefe R_t (DIN 4768/1)
Das ist der Abstand zwischen der Linie der größten Erhebung und der Linie der größten Vertiefung innerhalb der Messstrecke eines nach DIN 4768, Blatt 1 gefilterten Profils.

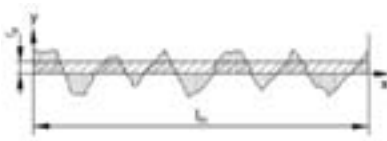
Pour la définition de l'état surface les dimensions sont définies par la norme DIN-ISO. En particulier c'est:

- Profondeur de la rugosité individuelle $Z_1 \dots Z_5$
C'est l'écart vertical entre le point le plus élevé et le point le plus bas du profil de rugosité R à l'intérieur de la longueur de référence individuelle l_e .
- Profondeur moyenne de la rugosité R_z (DIN 4768)
C'est la moyenne arithmétique des différentes profondeurs de la rugosité de 5 longueurs de référence adjacentes l_e .
- Rugosité moyenne arithmétique R_a (DIN 4768)
C'est la moyenne arithmétique des valeurs absolues des écarts du profil de rugosité R par rapport à la ligne moyenne, à l'intérieur de la longueur de référence l_m .
- Profondeur de la rugosité max. R_t (DIN 4768/1)
C'est l'écart entre la ligne de la bosse et la ligne du creux à l'intérieur de la longueur de référence d'un profil filtré selon DIN 4768, feuille 1.

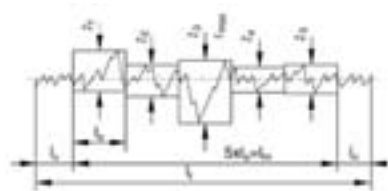
For the definition of surface roughness measured values are defined by DIN-ISO. In particular it means:

- Single surface roughness depth $Z_1 \dots Z_5$
This is the vertical distance between the highest and the lowest point of the roughness profile R within a single measured length l_e .
- Average roughness depth R_z (DIN 4768)
This is defined as the average value resulting from the single roughness depths of five successive single measured lengths l_e .
- Average roughness value R_a (DIN 4768)
This is defined as the arithmetical mean of the absolute sums of the roughness profile R within the entire measured length l_m .
- Max. surface roughness depth R_t (DIN 4768/1)
This is the distance between the elevation and depression of the line within the measured length (reference distance) of profile filtered according to DIN 4768 sheet 1.

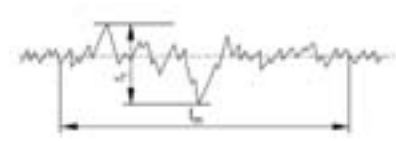
«Mittenrauwert R_a »
Rugosité moyenne arithmétique R_a
Average roughness value R_a



«Einzelrautiefe Z »
Rugosité individuelle Z
Single surface roughness depth Z



«Maximale Rautiefe R_t »
Rugosité maximale R_t
Maximum surface roughness R_t



Oberflächengüten nach Bearbeitungsarten | Rugosité de surface obtenue, en fonction de l'usage | Surface roughness by machining method

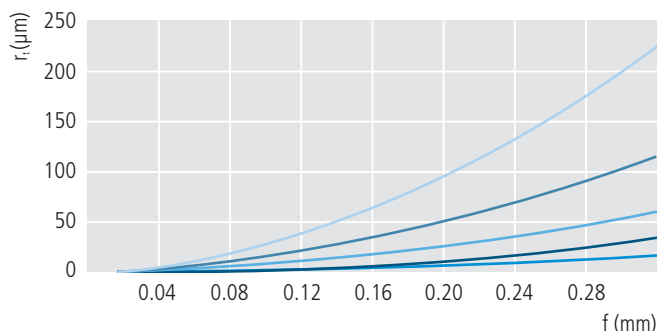
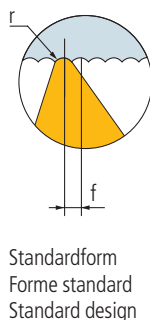
Oberflächengüten Rugosité Surface roughness													Bearbeitungsarten Type d'usinage Machining method
Oberflächenzeichen nach ISO 1302 Symboles de surface selon ISO 1302 Surface symbol according to ISO 1302	0.025	0.05	0.1	0.2	0.4	0.8	1.6	3.2	6.3	12.5	25	50	
Rauheitskennzahlen (früher) Indices de rugosité Roughness index (former)	N1	N2	N3	N4	N5	N6	N7	N8	N9	N10	N11	N12	
Mittenrauwert R_a (µm) Rugosité moyenne arithmétique Average roughness value	0.025	0.05	0.1	0.2	0.4	0.8	1.6	3.2	6.3	12.5	25	50	
Gemittelte Rautiefe R_z (µm) Profondeur de la rugosité Surface roughness depth	0.025	0.63	1	1.6	2.5	4–6.3	10	16–25	40	63	100	160	
					▼▼▼	▼▼▼	▼▼▼	▼▼	▼▼	▼▼	▼	▼	Längsdrehen/Plandrehen Tournage/Dressage Turning
			▼▼▼	▼▼▼	▼▼	▼▼	▼						Rund-Längs-/Rund-Planschleifen Rectification Grinding

THEORETISCHE RAUTIEFE RUGOSITÉ THÉORIQUE THEORETICAL SURFACE ROUGHNESS

r = Eckenradius (mm)
Rayon de pointe (mm)
Corner radius (mm)

r_t = Theoretische Rautiefe (μm)
Rugosité théorique (μm)
Theoretical surface roughness (μm)

f = Vorschub (mm)
Advance (mm)
Feed (mm)



— $r = 0.05 \text{ mm}$ — $r = 0.10 \text{ mm}$ — $r = 0.20 \text{ mm}$ — $r = 0.40 \text{ mm}$ — $r = 0.80 \text{ mm}$

VORSCHUBERHÖHUNG DURCH SCHLEPPSCHNEIDE SYSTEM TOP AUGMENTATION DE L'AVANCE AVEC SYSTÈME TOP IMPROVEMENT OF FEED RATE BY DRAG-CUT WITH TOP SYSTEM

Durch den Einsatz des Top-Systems mit Schleppschneide und der 93°-Halter kann der Vorschub bis zum 2-fachen erhöht werden. Somit können die Bearbeitungszeiten bei gleicher Qualität erheblich verringert oder bei gleicher Bearbeitungszeit bessere Oberflächen erzielt werden.

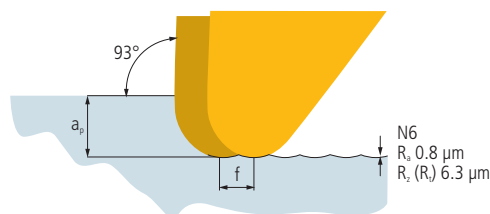
Im folgenden Beispiel wird das Prinzip genau dargestellt.

Avec l'utilisation des plaquettes système Top, montée sur un porte-outil à 93°, l'avance peut être augmentée jusqu'à 2 fois la valeur actuelle. Ainsi le temps d'usinage peut être diminué, tout en conservant la même qualité de surface.

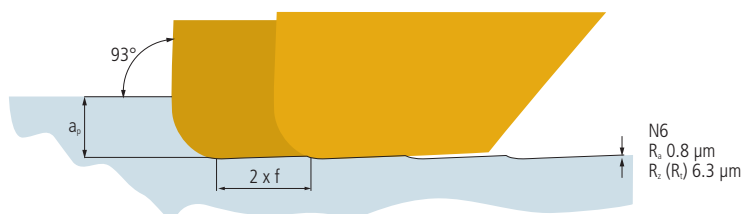
Dans l'exemple suivant vous voyez le principe.

By using the Top system with drag-cut and holder 93° the feed rate can be increased up to 2 times. This way the machining time can be decreased significantly by keeping the same quality. On the other hand within the same machining time the surface roughness can be improved clearly.

The following example illustrates the principle exactly.



Halter | Porte-outil | Holder 93°
Eckenradius | Rayon | Corner radius 0.8 mm



Halter | Porte-outil | Holder 93°
Eckenradius | Rayon | Corner radius 0.8 mm
Multidec®-Top-Schneide | Plaquette Multidec®-Top | Multidec®-Top insert

A Freiflächenverschleiss

Ursachen:

- zu hohe Schnittgeschwindigkeit
- Hartmetallsorte mit zu geringer Verschleissfestigkeit
- nicht angepasster Vorschub

Abhilfen:

- Schnittgeschwindigkeit senken
- härtere Beschichtung wählen
- Vorschub in richtiges Verhältnis zu Schnittgeschwindigkeit und Schnitttiefe setzen



A Usure en dépouille

Causes :

- Vitesse de coupe trop élevée
- Nuance de carbure à résistance à l'usure trop faible
- Avance non adaptée

Remèdes:

- Réduction de la vitesse de coupe
- Nuance de carbure plus résistante à l'usure
- Avance correspondante à la vitesse de coupe et à la profondeur de passe (augmentation de l'avance)

A Flank wear

Reasons:

- Cutting speed too high
- Carbide grade with too low wear resistance
- Feed rate not adapted

Remedies:

- Reduce cutting speed
- Select more wear resistant carbide grade
- Adapt feed rate to cutting speed and cutting depth (increase feed rate)

Abrieb an der Freifläche. Normaler Verschleiss nach einer gewissen Eingriffszeit.
 L'abrasion au niveau de la face de dépouille représente une usure courante après un certain temps d'utilisation.

Abrasion on flank, normal wear after a certain machining time.

B Ausbröckelung

Ursachen:

- zu verschleissfeste Sorte
- Vibrationen
- zu hoher Vorschub, bzw. zu hohe Schnitttiefe
- unterbrochener Schnitt
- Spanschlag

Abhilfen:

- zähere Sorte verwenden
- negative Schneidgeometrie mit Spanleitstufe verwenden
- Stabilität verbessern (Werkstück, Werkzeug)



B Écaillage

Causes:

- Nuance trop résistante à l'usure
- Vibrations
- Avance ou profondeur de passe trop importante
- Coupe interrompue
- «Martèlement» des copeaux

Remèdes:

- Nuance plus tenace
- Géométrie de coupe négative avec brise-copeaux
- Amélioration de la stabilité (outil, pièce)

B Edge chipping

Reasons:

- Grade with too high wear resistance
- Vibrations
- Feed rate too high or excessive cutting depth
- Interrupted cut
- Swarf damage

Remedies:

- Use tougher grade
- Use negative cutting edge geometry with chip groove
- Increase stability (tool, work piece)

Durch überhöhte mechanische Beanspruchung der Schneidkante können HM-Partikel ausbrechen.
 Dû à la surcharge mécanique de l'arête de coupe, des particules de carbure peuvent se détacher.
 Through excessive mechanical stress at the cutting edge fracture and chipping can take place.

C Kolkverschleiss

Ursachen:

- zu hohe Schnittgeschwindigkeit, Vorschub oder beides
- zu geringer Spanwinkel
- Sorte mit zu geringer Verschleissfestigkeit
- falsch zugeführte Kühlung

Abhilfen:

- Schnittgeschwindigkeit und/oder Vorschub herabsetzen
- härtere Beschichtung wählen oder Anzahl der Schichten erhöhen (CVD)
- Kühlmittelmenge und/oder Druck erhöhen, Zuführung kontrollieren



C Usure en cratère

Causes:

- Vitesse de coupe trop élevée et/ou avance trop importante
- Angle de coupe trop faible
- Nuance de carbure à résistance à l'usure trop faible
- Mauvaise lubrification

Remèdes:

- Réduction de la vitesse de coupe et/ou de l'avance
- Nuance de carbure plus résistante à l'usure
- Augmentation du débit et/ou de la pression du liquide de coupe, contrôle du jet
- Nuance plus résistante à l'usure en cratère

C Cratering

Reasons:

- Too high cutting speed and/or feed rate
- Rake angle too shallow
- Grade with low wear resistance
- Insufficient coolant supply

Remedies:

- Reduce cutting speed and/or feed rate
- Increase coolant quantity and/or pressure, optimize coolant supply
- Use grade which is more resistant to cratering

Der ablaufende heiße Span verursacht eine Auskolkung der Schneidplatte an der Spanfläche.
 L'écoulement du copeau chaud provoque une cratérisation de la plaquette sur la face de coupe.
 The hot chip which is being evacuated causes cratering at the rake face of the cutting edge.

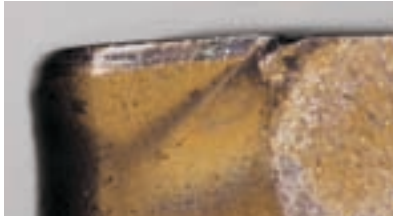
D Plastische Verformung

Ursachen:

- zu hohe Arbeitstemperatur, daher Erweichung des Grundmaterials
- Beschädigung der Beschichtung
- zu enge Spanleitstufe

Abhilfen:

- Schnittgeschwindigkeit herabsetzen
- verschleißfestere HM-Sorte wählen
- Kühlung vorsehen



D Déformation plastique

Causes:

- Température de travail trop élevée, d'où un affaissement du substrat
- Endommagement du revêtement

Remèdes:

- Réduction de la vitesse de coupe
- Nuance de carbure plus résistante à l'usure
- Amélioration de la lubrification

D Plastic deformation

Reasons:

- Too high machining temperature, resulting in softening of substrate
- Damaged coatings

Remedies:

- Reduce cutting speed
- Choose carbide grade with higher wear resistance
- Provide cooling

Hohe Zerspanungstemperatur bei gleichzeitiger mechanischer Beanspruchung kann zu plastischer Verformung führen.

La combinaison d'une température d'usinage élevée et d'une charge mécanique peut provoquer une déformation plastique.

High machining temperature and simultaneous mechanical stress can lead to plastic deformation.

E Aufbauschneidenbildung

Ursachen:

- zu geringe Schnittgeschwindigkeit
- zu kleiner Spanwinkel
- falscher Schneidstoff
- fehlende Kühlung/Schmierung

Abhilfen:

- Schnittgeschwindigkeit erhöhen
- Spanwinkel erhöhen
- verschleißfestere Beschichtung oder polierte Spanfläche einsetzen
- fettene Emulsion verwenden



E Arête rapportée

Causes:

- Vitesse de coupe trop faible
- Angle de coupe trop petit
- Matériaux de coupe inadaptés
- Absence de lubrification

Remèdes:

- Augmentation de la vitesse de coupe
- Angle de coupe plus important
- Revêtement TiN
- Vérification du dosage de l'émulsion

E Built-up edges

Reasons:

- Too low cutting speed
- Too small rake angle
- Wrong cutting material
- Lack of cooling/lubrication

Remedies:

- Increase cutting speed
- Enlarge rake angle
- Apply TiN-coating
- Use emulsion with higher concentration

Materialaufschweissungen an der Schneidkante treten auf, wenn der Span infolge zu niedriger Schnitttemperatur nicht richtig abfließt.

Lorsqu'une température de coupe trop faible empêche l'écoulement du copeau, de la matière se colle à l'arête de coupe.

Built-up material/edges occur when the chip is not evacuated properly due to a too low cutting temperature.

F Plattenbruch

Ursachen:

- Überlastung des Schneidstoffes
- Stabilitätsmangel
- Keilwinkel zu klein
- übermäßiger Kerbverschleiß

Abhilfen:

- zäheren Schneidstoff verwenden
- Kantenschutzfase verwenden
- Schneidkantenverrundung vergrößern
- stabilere Geometrie einsetzen



F Rupture de plaquette

Causes:

- Surcharge du matériau de coupe
- Manque de stabilité
- Angle de tranchant inadapté

Remèdes:

- Matériau plus tenace
- Arête chanfreinée
- Honing plus important
- Géométrie mieux adaptée

F Insert breakage

Reasons:

- Excessive stress of cutting material
- Lack of stability
- Corner angle too small
- Excessive notching

Remedies:

- Use tougher cutting material
- Use protective edge chamfer
- Increase honing of edge
- Use more stable geometry

Bei einer Überlastung der Schneidplatte kann es zum Plattenbruch kommen.

Une surcharge sur la plaquette peut entraîner sa rupture.

Excessive stress of the insert causes breakage.

PROBLEME UND ABHILFEN BEI VERSCHLEISSMERKMALEN DES PROBLÈMES ET REMÈDES EN CAS D'USURE PROBLEMS AND THEIR REMEDIES IN DIFFERENT CASES

Problem Problème Problem	Abhilfe/Massnahme Remèdes/Mesures Remedy/Measure	Schnittgeschwindigkeit Vitesse de coupe Cutting speed	Vorschub Avance Feed	HM-Zähigkeit Ténacité du métal dur Insert toughness	HM-Verschleissfestigkeit Résistance à l'usure du métal dur Insert hardness	Anstellwinkel Angle de direction Clearance angle	Spanwinkel Angle de coupe Rake angle	Stabilität Stabilité Stability	Schneidkantenverrundung Arête de coupe arrondie Rounded edge condition	Kühlung Refroidissement Coolant	Plan-/Rundlaufgenauigkeit Concentricité et planéité Face/radial runout
A* Übermässiger Freiflächenverschleiss Usure anormale de la face de dépouille Excessive flank wear		↓	↑		↑						
B* Schneidkantenausbröckelung Ecaillage sur l'arête de coupe Chipping of cutting edge		↑	↓	↑			🔍	↑	↑		
C* Übermässiger Kolkverschleiss Cratérisation anormale Excessive cratering		↓	↓		↑					↑	
D* Schneidkantendeformation Déformation de l'arête de coupe Plastic deformation		↓	↓		↑		🔍			🔍	
E* Aufbauschneidenbildung Formation l'arête rapportée Built up edge		↑	↑			🔍	↑		🔍	↑	
F* Schneidkantenausbrüche, WSP-Bruch Cassures de l'arête ou de la plaquette Insert breakage			↓	↑			🔍	↑			
Schlechte Werkstückoberfläche Mauvais état de surface de la pièce Poor surface finish		↑	↓					↑	↓	🔍	↑
Spanbildung, Spänestau Formation du copeau, barrage du copeau Chip forming, chip pile up						🔍	🔍			🔍	
Vibration Vibration Vibration		🔍	🔍			↓	↑	↑			↑
Kammrisse Microfissures Hairline cracks		↓	↓	🔍		↓				↑	



erhöhen, vergrössern
augmenter
increase



vermindern, verkleinern
réduire
decrease



kontrollieren, optimieren
contrôler, optimiser
inspect, optimise

* Näheres | Plus d'informations | Further information ⓘ 18

INFORMATIONEN ZU VERSCHLEISSURSACHEN

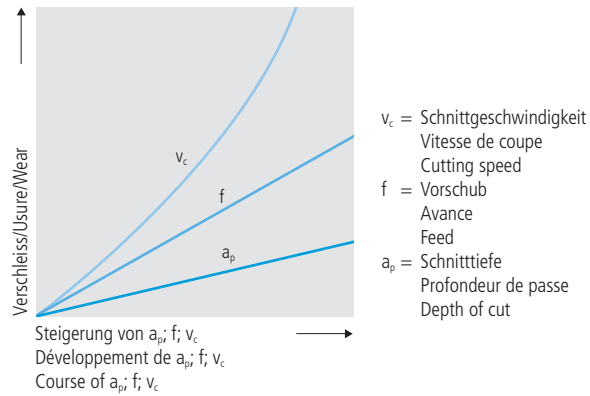
INFORMATIONS TECHNIQUES SUR LES CAUSES DE L'USURE

INFORMATION ABOUT CAUSES OF WEAR

Die Schnitttemperatur bzw. der Verschleiss hängt entscheidend von den Zerspanungsbedingungen (v_c , f , a_p) ab. Dabei nehmen die thermisch bedingten Verschleissursachen, Oxidation und Diffusion, überproportional zu.

La température de coupe, respectivement l'usure, dépend des conditions de coupe (v_c , f , a_p). Cependant, les dégradations en raison de la température de coupe, de l'oxydation et de la diffusion, augmentent surproportionnellement.

The cutting temperature particularly the wear depends significantly on the cutting conditions (v_c , f , a_p). Thermal causes of wear like oxidation and diffusion increase disproportionately.

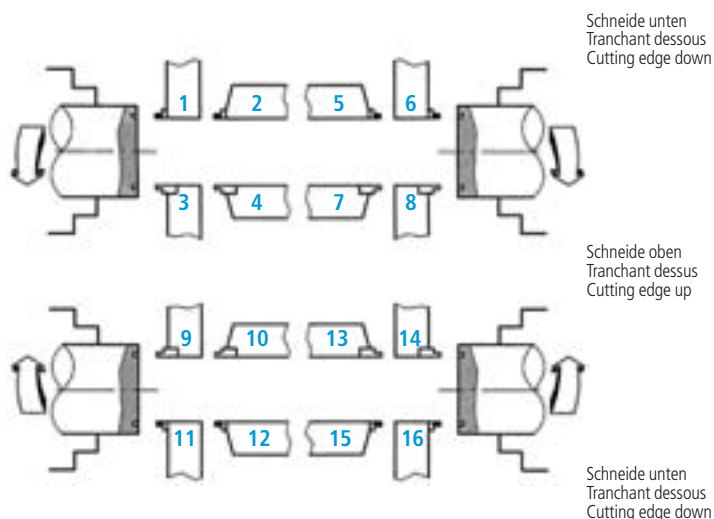


Anhand des untenstehenden Schemas sind alle unterschiedlichen Bearbeitungs-Situationen dargestellt. Bestimmen Sie Ihre Bearbeitungs-Situation und Utilis gibt Ihnen dann die passende Werkzeug-Empfehlung.

Il est possible de représenter les différentes situations d'usinage selon le schéma que vous trouverez en bas de la page. Déterminez votre situation d'usinage et nous vous ferons une offre avec les préconisations d'outillage correspondantes.

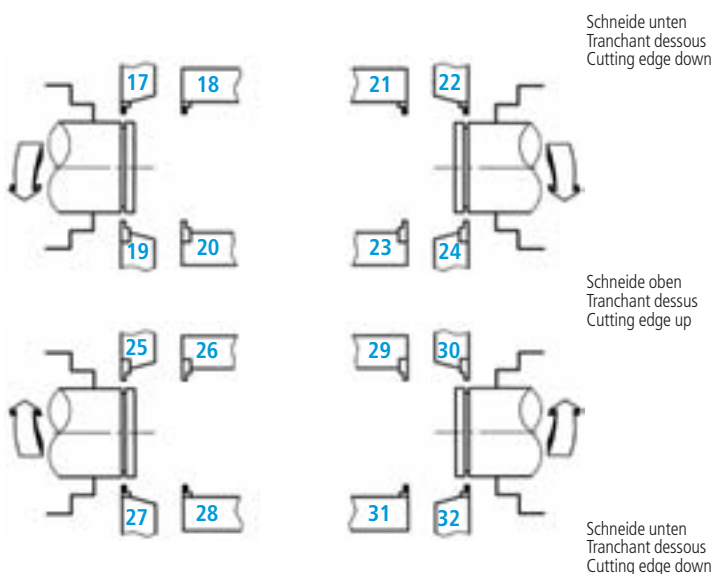
With the illustration below it is possible to achieve up different tooling situations. Choose yours and we will recommend you the suitable tooling solution.

Drehen axial | Tournage axial | Turning axial



Situation Situation Situation	Halter Porte-Outil Holder	Schneide Plaquette Insert
1	R	L
2	L	L
3	R	L
4	L	L
5	R	R
6	L	R
7	R	R
8	L	R
9	L	R
10	R	R
11	L	R
12	R	R
13	L	L
14	R	L
15	L	L
16	R	L

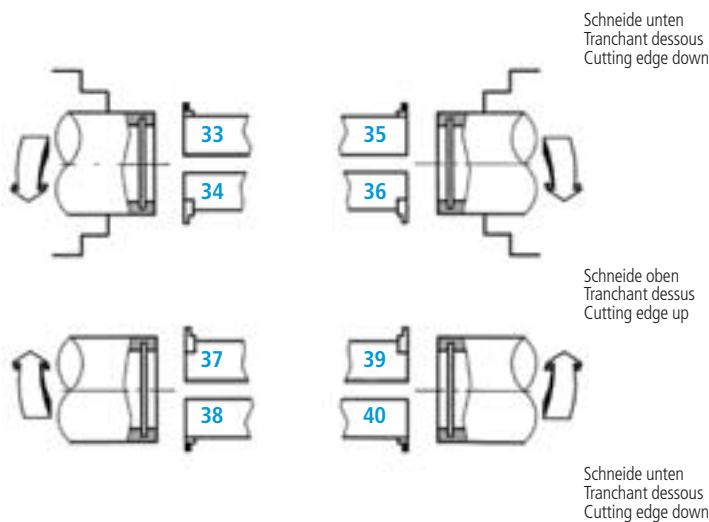
Drehen radial aussen | Tournage radial extérieur | Turning radial outside



Situation Situation Situation	Halter Porte-Outil Holder	Schneide Plaquette Insert
17	R	R
18	L	R
19	R	R
20	L	R
21	R	L
22	L	L
23	R	L
24	L	L
25	L	L
26	R	L
27	L	L
28	R	L
29	L	R
30	R	R
31	L	R
32	R	R

R = rechts | droite | right L = links | gauche | left

Drehen radial innen | Tournage radial intérieur | Turning radial inside



Situation Situation Situation	Halter Porte-Outil Holder	Schneide Plaquette Insert
33	R	L
34	R	L
35	L	R
36	L	R
37	L	R
38	L	R
39	R	L
40	R	L

R = rechts | droite | right L = links | gauche | left

Ausführung Halter/Wendeschneidplatte

Ob ein Halter als «links» oder «rechts» definiert ist, bestimmt die Seite an der die Wendeschneidplatte sitzt. Dabei ist der Halter mit der Schneide zur Person hin zu halten.

Linker Halter
Outil à gauche
Left hand holder



Neutraler Halter
Outil neutre
Neutral holder



Rechter Halter
Outil à droite
Right hand holder

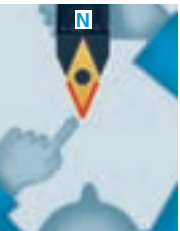


Exécution de porte-outil/plaquette

La reconnaissance des outillages se pratique de la manière indiquée sur le dessin ci-dessous, c'est-à-dire l'outil vu de dessus, la plaquette contre soi.



Linke Schneide
Plaquette à gauche
Left insert



Neutrale Schneide
Plaquette neutre
Neutral insert



Rechte Schneide
Plaquette à droite
Right insert

Execution of holder/insert

The side on which the insert is located defines if it is a left or right hand holder. While doing so the holder with the insert has to be pointed towards the person.

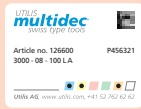
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Kurzbeschreibung Gamme de produits Product line		26																				
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Schneiden Plaquettes Inserts		34																				
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	Bsp. 1 Bsp. 1 Bsp. 1	Bsp. 2 Bsp. 2 Bsp. 2	Bsp. 3 Bsp. 3 Bsp. 3	Bsp. 4 Bsp. 4 Bsp. 4																		
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Einlege- Länge mm	1	1	10	10																		
Spindel- Drehzahl min	100-300	100-200	200-300	-																		
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Multidec®-Cut wird primär zum Aussendrehen, aber auch zum Innendrehen eingesetzt. 4 Systeme unterscheiden sich in den Stechtiefen und -breiten sowie deren Anwendung in der Zerspanung. Alle Wendeschneidplatten sind leicht auswechselbar und zeichnen sich durch eine sehr hohe Wiederholgenauigkeit aus. Für die Bearbeitung aller gängigen Werkstoffe stehen ideal abgestimmte Hartmetallsorten aus Feinkornsubstraten (K10–K40, PVD beschichtet und unbeschichtet) zur Verfügung.

Multidec®-Cut est un outillage conçu pour le décolletage extérieur et intérieur. Les 4 systèmes proposés se distinguent par des capacités et des largeurs de coupes spécifiques. Toutes les plaquettes sont aisément interchangeables avec une haute précision de répétitivité. Différentes nuances de carbures, mais aussi de revêtements sont disponibles (K10-K40, sans revêtement et avec revêtement PVD).

Multidec®-Cut is most commonly used in OD-turning or alternatively in ID-turning. 4 systems are distinguished by the cutting depth or width and application field of machining process. All inserts are replaceable very easy and known for its great repeat accuracy. For cutting of all common materials we offer ideal adjusted micrograin carbides grades (K10-P40 PVD coated and uncoated).

Multidec®-Cut 500



Das Stech-/Drehwerkzeug-System 500 ist für Langdrehautomaten mit Stangendurchlass bis maximal Ø 15 mm ideal. Die neutralen Schneidplatten, welche nur als Rohlinge angeboten werden, verfügen über eine Schneide und können auf den vergüteten Haltern mit einem Schaftquerschnitt von 6 – 10 mm befestigt werden. Die Wiederholgenauigkeit ist < 0.01 mm.

Le système 500 a été développé pour une utilisation sur décolleteuse à cames avec un passage de barre de 8 mm maxi. Les plaquettes à affûter soi-même sont fixées sur des porte-outils cimentés-trempés aux sections carrées de 6 à 10 mm, avec une répétitivité de 0.01 mm.

The turn and cut-off system 500 is suitable for Swiss type cam lathes up to bar diameter 15 mm. The neutral cutting inserts, only available as blanks, consist of one cutting edge and will be mounted on tempered tool holders with a cross section from 6 to 10 mm. The insert seat warrants a repeatability of < 0.01 mm.

Vorteile

- Ersatz für die gelöteten Hartmetall Drehstähle der kurvengesteuerten Langdrehautomaten
- Rohlinge mit polierter Spanfläche
- Rohlinge beschichtet und unbeschichtet erhältlich
- Anwender kann seine individuellen Schneidgeometrien selber schleifen

Avantages

- Remplace les burins brasés des machines à cames
- Face de coupe glacées
- Ebauches revêtues et non-revêtues disponibles
- L'utilisateur donne forme à la plaquette à sa convenance.
- Plaquette neutre

Advantages

- Replace brazed tools on cam machines
- Inserts with mirror polished cutting face
- Coated and uncoated blanks available
- Machine operator can grind his form himself

Multidec®-Cut 1600



Das Stech-/Drehwerkzeug-System 1600 ist für Langdrehautomaten mit Stangendurchlass bis maximal Ø 10 mm ideal. Die Wendeschneidplatten verfügen über zwei Schneiden und können auf einsatzgehärteten Haltern mit einem Schaftquerschnitt von 7 – 25 mm befestigt werden. Die Wiederholgenauigkeit ist < 0.01 mm.

Le système 1600 est destiné au décolletage de petites pièces sur des décolleteuses au passage de barres max. de Ø 10 mm. Les plaquettes disposent de deux arêtes de coupe et sont fixées sur des porte-outils cimentés – trempés aux sections carrées de 7 à 25 mm, avec une répétitivité de < 0.01 mm.

The turn and cut-off system 1600 is suitable for Swiss type lathes up to bar diameter 10 mm. The cutting inserts consist of two cutting edges and will be mounted on tempered tool holders with a cross section from 7 to 25 mm. The insert seat warrants a repeatability of < 0.01 mm and allows a 100 % utilization of all cutting edges.

Vorteile

- Grosse Auswahl an Schneidgeometrien mit speziellen Spanleitstufen für die Bearbeitung von Kleinstteilen
- Standard Gewindeplatten mit Vollprofil ab M 0.2 (Steigung 0.06 mm)
- Einstechplatten mit Standardbreiten ab 0.05 mm

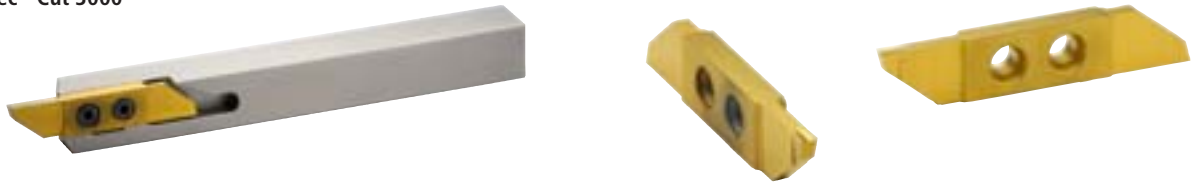
Avantages

- Grand choix de géométries de coupe adaptées à l'usage de petites pièces
- Plaquettes standards de filetage, avec profil complet, dès M 0.2 (pas de 0.06 mm)
- Plaquettes standards de rainurage, largeur à partir de 0.05 mm

Advantages

- Large selection of cutting geometries with different chip breakers especially made for smallest parts
- Full profile threading inserts starting from M 0.2 (0.06 mm pitch)
- Grooving inserts width starting from 0.05 mm

Multidec®-Cut 3000



Ein Stech-/Drehwerkzeug für Langdrehautomaten mit einem Stangendurchlass von maximal Ø 32 mm. Die Wendeschneidplatten haben zwei Schneiden und werden auf einsatzgehärteten Haltern mit einem Schaftquerschnitt von 8 – 25 mm befestigt. Der geschützte Plattensitz garantiert eine Wiederholgenauigkeit < 0.01 mm und erlaubt die 100 %-Nutzung der Schneiden.

Un système d'outils de décolletage pour les décolleteuses au passage de barre max. de Ø 32 mm. Les plaquettes disposent de deux arrêtes de coupe et sont fixées sur des porte-outils cimentés – trempés aux sections carrées de 8 à 25 mm. Le système de fixation est entièrement à l'abri des copeaux et garantit une répétitivité de < 0.01 mm, ainsi qu'une utilisation des deux arrêtes de coupe à 100 %.

A turn and cut-off tool system for Swiss type lathes up to bar diameter 32 mm. The cutting inserts consist of two cutting edges and will be mounted on tempered tool holders with a cross section from 8 to 25 mm. The insert seat, which is protected from contamination, warrants a repeatability of < 0.01mm and allows a 100 % utilization of all cutting edges.

Vorteile

- Grosse Auswahl an Schneidgeometrien
- Spezielle Spanleitstufen für die Bearbeitung von kleinen bis mittelgrossen Teilen
- Exakte Positionierung durch 2 Schrauben mit Anschlag für axiale Ausrichtung
- Grosse Auflagefläche garantiert eine senkrechte Ausrichtung
- Schnittkräfte werden direkt von der Wendeschneidplatte auf den Halter übertragen, sodass keine Abscherkräfte auf die Schrauben wirken
- Wendeschneidplatten nachschleifbar
- Zweite, intakte Schneide auch nach Bruch einsetzbar
- Ideal für die Bearbeitung von rostfreien Stählen und Titan
- Stabiles System erlaubt hohe Vorschübe

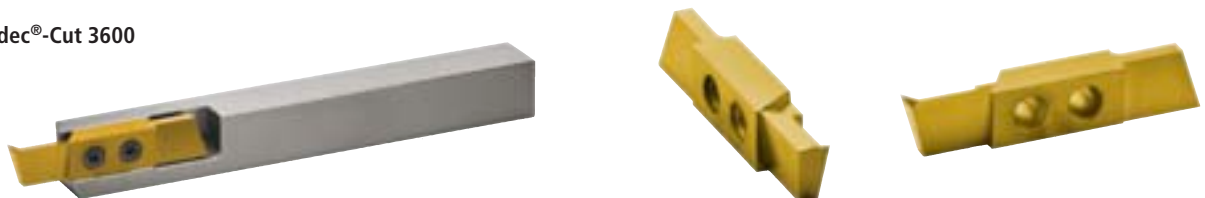
Avantages

- Toutes les géométries connues avec des brises copeaux sont standards
- Positionnement précis grâce à deux vis de fixation, butée réelle de positionnement axial et grande face d'appui garantissant une excellente perpendicularité
- Les efforts de coupe sont transmis directement de la plaquette à son porte-outil, ainsi les vis de fixation ne subissent aucun effort de cisaillement
- Les plaquettes sont réaffûtables
- 2ème arête de coupe utilisable, même si la première manque
- Idéal pour l'usinage de l'acier inox et du titane
- Système rigide qui autorise de grandes avances

Advantages

- Large selection of insert geometries with different chip breaker geometries
- Special chip breaker design for machining of small to mid sized work pieces
- Perpendicularity guaranteed by two fixing screws, large support face and a genuine stop face for axial positioning
- The cutting force becomes directly passed forward to the holder and does not affect the screws they are not affected by shear stress
- Inserts can be reground
- 2nd edge still useable after crash of the first one
- Ideal for machining stainless steels and titanium
- Ideal system for large feed rates

Multidec®-Cut 3600



Ein Stech-/Drehwerkzeug für Langdrehautomaten mit einem Stangendurchlass von maximal Ø 20 mm. Die Wendeschneidplatten haben zwei Schneiden und werden auf gehärteten Haltern mit einem Schaftquerschnitt von 10 – 25 mm befestigt. Der geschützte Plattensitz garantiert eine Wiederholgenauigkeit < 0.01 mm und erlaubt die 100 %-Nutzung der Schneiden.

Un système d'outils de décolletage pour les décolleteuses au passage de barre max. de Ø 20 mm. Les plaquettes disposent de deux arrêtes de coupe et sont fixées sur des porte-outils cimentés – trempés aux sections carrées de 10 à 25 mm. Le système de fixation est entièrement à l'abri des copeaux et garantit une répétitivité de < 0.01 mm, ainsi qu'une utilisation des deux arrêtes de coupe à 100 %.

A turn and cut-off tool for Swiss type lathes up to bar diameter 20 mm. The cutting inserts consist of two cutting edges and will be mounted on tempered tool holders with a cross section from 10 to 25 mm. The insert seat, which is protected from contamination, warrants a repeatability of < 0.01mm and allows a 100 % utilization of all cutting edges.

Vorteile

- Geeignet zum Einstechen von breiten Formen bis 6 mm
- Rohlinge als beschichtet und unbeschichtet erhältlich
- Anwender kann seine individuellen Schneidgeometrien selber schleifen

Avantages

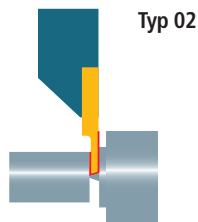
- Système pour le fonçage des formes avec des largeurs de 6 mm
- Ebauches revêtues et non revêtues disponibles
- L'utilisateur donne forme à la plaquette à sa convenance

Advantages

- System for grooving large and wide forms up to 6 mm
- Coated and uncoated blanks available
- Machine operator can grind his form him self

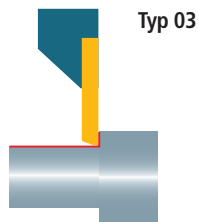
Abstechen
Tronçonnage
Cut off

Schneiden | Plaquettes | Inserts □ 36...



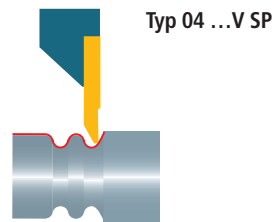
Vornedrehen
Tournage avant
Front turning

Schneiden | Plaquettes | Inserts □ 46...



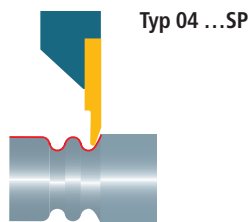
Kopierdrehen (vorne)
Tournage par copiage (avant)
Copy turning (front)

Schneiden | Plaquettes | Inserts □ 49...



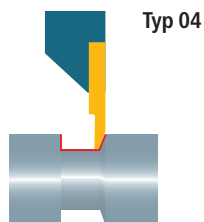
Kopierdrehen (hinten)
Tournage par copiage (arrière)
Copy turning (back)

Schneiden | Plaquettes | Inserts □ 50...



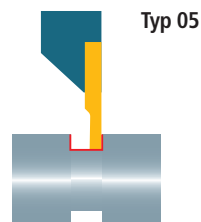
Hintendrehen
Tournage arrière
Back turning

Schneiden | Plaquettes | Inserts □ 51...



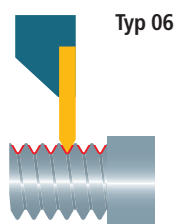
Einstechen und Längsdrehen
Rainurage et tournage
Grooving and Turning

Schneiden | Plaquettes | Inserts □ 54...



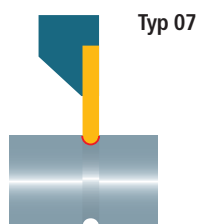
Gewindedrehen
Filetage
Threading

Schneiden | Plaquettes | Inserts □ 56...



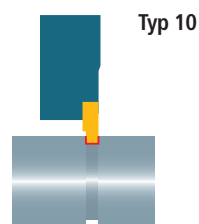
Radius-Einstich
Rainurage-rayonnage
Radius-grooving

Schneiden | Plaquettes | Inserts □ 61...



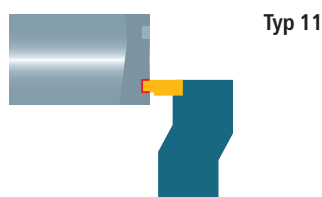
Einstechen (radial)
Rainurage (radial)
Grooving (radial)

Schneiden | Plaquettes | Inserts □ 62...



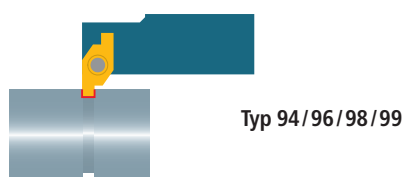
Einstechen (axial)
Rainurage (axial)
Grooving (axial)

Schneiden | Plaquettes | Inserts □ 63...



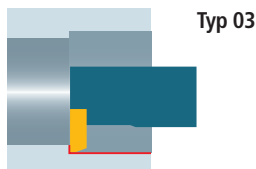
Sonderschneiden (auf Wunsch)
Plaquettes spéciales (sur demande)
Special inserts (on demand)

Schneiden | Plaquettes | Inserts □ 65...



Vornedrehen
 Tournage avant
 Front turning

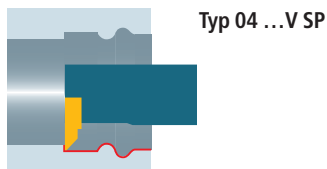
Schneiden | Plaquettes | Inserts 46...



Typ 03

Kopierdrehen (vorne)
 Tournage par copiage (avant)
 Copy turning (front)

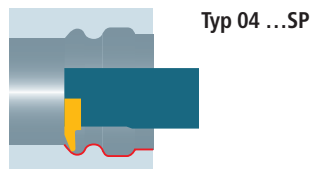
Schneiden | Plaquettes | Inserts 49...



Typ 04 ...V SP

Kopierdrehen (hinten)
 Tournage par copiage (arrière)
 Copy turning (back)

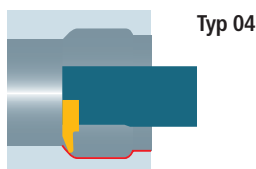
Schneiden | Plaquettes | Inserts 50...



Typ 04 ...SP

Hintendrehen
 Tournage arrière
 Back turning

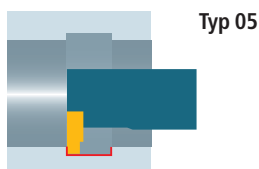
Schneiden | Plaquettes | Inserts 51...



Typ 04

Einstechen und Längsdrehen
 Rainurage et tournage
 Grooving and Turning

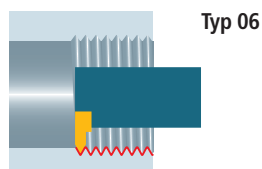
Schneiden | Plaquettes | Inserts 54...



Typ 05

Gewindedrehen
 Filetage
 Threading

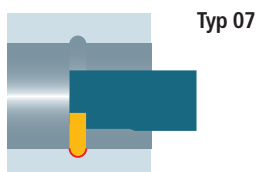
Schneiden | Plaquettes | Inserts 56...



Typ 06

Radius-Einstich
 Rainurage-rayonnage
 Radius-grooving

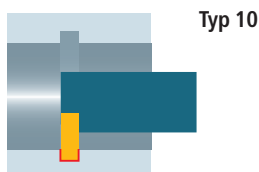
Schneiden | Plaquettes | Inserts 61...



Typ 07

Einstechen
 Rainurage
 Grooving

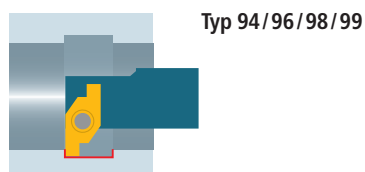
Schneiden | Plaquettes | Inserts 62...



Typ 10

Sonderschneiden (auf Wunsch)
 Plaquettes spéciales (sur demande)
 Special inserts (on demand)

Schneiden | Plaquettes | Inserts 65...



Typ 94/96/98/99

Halter | Porte-outils | Holders

66...

Alle Abbildungen sind in rechter Ausführung dargestellt. Linke Ausführung auch lieferbar.

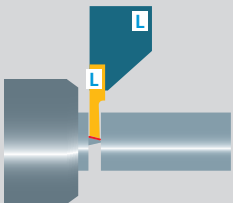
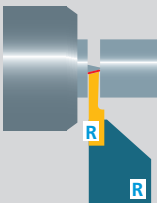
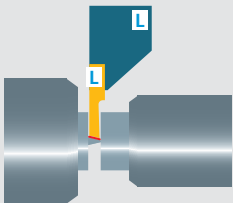
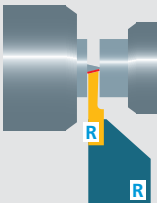
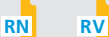
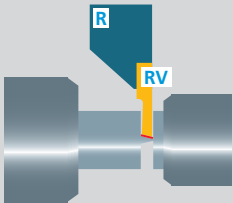
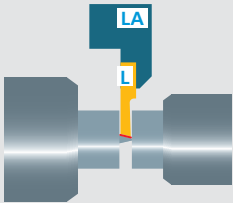
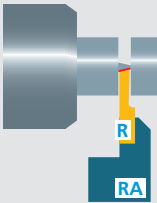
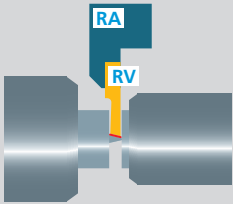
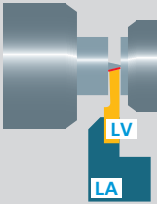
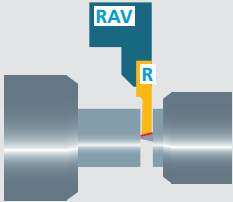
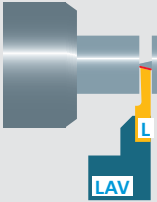
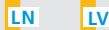
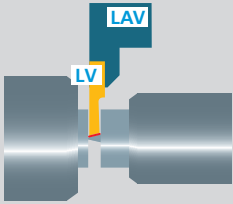
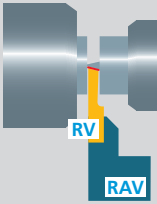
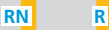
Toutes les illustrations représentent des exécutions à droite. Les exécutions à gauche sont aussi livrables.

All illustrations show right hand design. Left hand design is also available.

Durch eine andere Kombination von Halter und Wendeschneidplatte kann die Bearbeitung eines Werkstückes auch in schwierigen Bearbeitungs-Situationen fortgesetzt werden.

Il est possible de conserver la géométrie définie, tout en changeant de côté la plaquette, pour optimiser la coupe dans une situation difficile.

A different combination of holder and insert allows cutting even in difficult situations.

Hauptspindel links Broche principale gauche Main-spindle left	Mögliche Schneiden-Ausführungen Possibilités d'exécution des plaquettes Possibilities of insert execution	Hauptspindel links Broche principale gauche Main-spindle left	Mögliche Schneiden-Ausführungen Possibilités d'exécution des plaquettes Possibilities of insert execution	
				1
				2
				3
				4
				5
				6
				7
A		B		

Durch eine andere Kombination von Halter und Wendeschneidplatte kann die Bearbeitung eines Werkstückes auch in schwierigen Bearbeitungs-Situationen fortgesetzt werden.

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A different combination of holder and insert allows cutting even in difficult situations.

Hauptspindel rechts Broche principale droite Main-spindle right	Mögliche Schneiden-Ausführungen Possibilités d'exécution des plaquettes Possibilities of insert execution	Hauptspindel rechts Broche principale droite Main-spindle right	Mögliche Schneiden-Ausführungen Possibilités d'exécution des plaquettes Possibilities of insert execution	
				1
				2
				3
				4
				5
				6
				7
C		D		

Anwendung Application Application	Spanleitstufe Brise-copeau Chip breaker		Bearbeitung Usinage Machining Method			Eigenschaften Propriétés Characteristics
	Typ Type Typ		▼	▼▼	▼▼▼	
		... 02	○ ○ ○ ●	● ● ● —	● ● ● —	Abstechen ohne Spanleitstufe Tronçonnage sans brise copeau Cut off without chip breaker
		... 02 SC	● ● ● ●	● ● ● ○	● ● ● —	Abstechen mit Spanbrecher Tronçonnage avec brise copeau Cut off with chip breaker
		... 02 SPT	— ○ ○ ●	— ● ● ●	— ● ● ●	Abstechen mit Spanleitstufe für weiche Materialien Tronçonnage avec brise copeau pour matière tendre Cut off with chip breaker for tender material
		... 03	● ● ○ ●	● ● ● —	● ● ● —	Vornedrehen ohne Spanleitstufe Tournage avant sans brise copeau Front turning without chip breaker
		... 03 SP	○ ○ ○ ●	● ● ● ●	● ● ● ●	Vornedrehen mit Spanleitstufe Tournage avant avec brise copeau Front turning with chip breaker
		... 03 CP TOP	○ ○ ○ ●	● ● ● ●	● ● ● ●	Vornedrehen mit Spanleitstufe und Schleppschnide «TOP» Tournage avant avec brise copeau et géométrie de coupe «TOP» Front turning with chip breaker and cutting edge «TOP»
		... 04	● ● ○ ●	● ● ● —	● ○ ○ —	Hintendrehen ohne Spanleitstufe Tournage arrière sans brise copeau Back turning without chip breaker
		... 04 CP	○ ○ ○ ●	● ● ● ●	● ● ● ●	Hintendrehen mit Spanleitstufe Tournage arrière avec brise copeau Back turning with chip breaker
		... 04 SP	○ ○ ○ ●	● ● ● ●	● ● ● ●	Kopierdrehen mit Spanleitstufe Tournage par copiage avec brise copeau Copy turning with chip breaker
		... 04 TOP	○ ○ ○ ●	● ● ● ●	● ● ● ●	Hintendrehen mit Spanleitstufe und Schleppschnide «TOP» Tournage arrière avec brise copeau et géométrie de coupe «TOP» Back turning with chip breaker and cutting edge «TOP»
		... 05	● ○ ○ ●	● ● ● ○	● ○ ○ —	Einstechen und Längsdrehen ohne Spanleitstufe Rainurage et tournage sans brise copeau Grooving and turning without chip breaker
		... 05 CP	○ ○ ○ ●	● ● ● ●	● ● ● ●	Einstechen und Längsdrehen mit Spanleitstufe Rainurage et tournage avec brise copeau Grooving and turning with chip breaker
		... 06	— — — —	— — — ○	● ● ● ●	Gewindeschneiden Teilprofil Filetage profil partiel Threading partial profile
		... 06 VP	— — — —	— — — ○	● ● ● ●	Gewindeschneiden Vollprofil Filetage profil complet Threading full profile
			... 07	— — — —	● ● ● ●	● ● ● ●
		... 10	— — — —	● ● ● ●	● ● ● ●	Einstechen radial Rainurage radial Grooving radial
		... 11	— — — —	● ● ● ●	● ● ● ●	Einstechen Axial Rainurage axial Grooving axial

Die Bezeichnung jeder Schneide oder jedes Halters beinhaltet alle wesentlichen Kriterien, welche nach folgendem System zusammengesetzt sind:

Les désignations de chaque plaquette et porte-outil répondent aux critères du système suivant:

The designation of every insert and holder includes all important information according to the following system:

Schneiden | Plaquettes | Inserts

3002 - 1.5 - 8L SC UHM30 HX

Beschichtung | Revêtement | Coating

Schneidstoff | Matériaux de coupe | Cutting material

Spanleitstufe oder Sonderausführung | Brise copeau ou exécution spéciale | Chip breaker or special execution

Ausführung | Exécution | Execution

Maximale Tiefe | Profondeur maximale | Maximum depth (mm)

Breite | Largeur | Width (mm)

Schneidenform | Type | Cutting design

Programm | Ligne de produits | Product line

UTILIS
multidec
swiss type tools



Article no. 137212 P456321
3002 - 1.5 - 8L SC UHM30 HX



Utilis AG, www.utilis.com, +41 52 762 62 62

Halter | Porte-outils | Holders

3000 - 08 - 100 LA

versetzt | déportée | offset

Ausführung | Exécution | Execution

Länge | Longueur | Length (mm)

Schaftquerschnitt | Section du porte-outil | Holders cross section (mm)

Serie | Série | Edition

Programm | Ligne de produits | Product line

UTILIS
multidec
swiss type tools



Article no. 126600 P456321
3000 - 08 - 100 LA

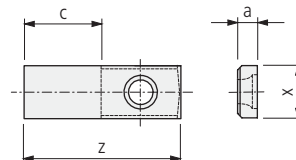


Utilis AG, www.utilis.com, +41 52 762 62 62

Rohling | Ebauche | Blank

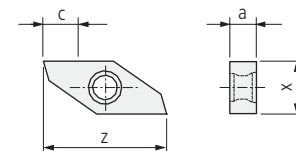
34

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Tooling for High Technology



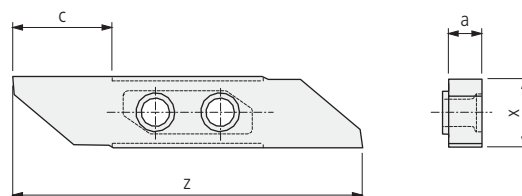
Bezeichnung Désignation Designation	Hartmetall Carbure Carbide			Dimensionen Dimensions Dimensions								Halter Porte-outil Holder
	●	●	●	a	c	x	z					
Typ 01	○	○	●									□ 66...
N Neutrale Ausführung Exécution neutre Neutral execution	...	...	...									
501-2-6 N	■	■	■	2	8.5	6	17.8					500...
501-2-6 N P*	■	■	■	2	8.5	6	17.8					500...

* Hochglanz poliert | Poli miroir | Mirror polished



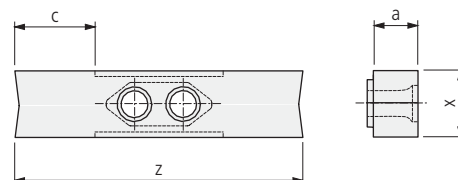
Bezeichnung Désignation Designation	Hartmetall Carbure Carbide			Dimensionen Dimensions Dimensions								Halter Porte-outil Holder
	●	●	●	a	c	x	z					
Typ 01	○	○	●									□ 67...
N Neutrale Ausführung Exécution neutre Neutral execution	...	...	...									
1601-3-4 N	■	□	□	3	4	6	14					1600...
1601-3-5 N	■	□	□	3	5	6	16					1600...
1601-4-4 N	■	□	□	4	4	6	14					1600...
1601-6-5 N	■	□	□	6	5	6	16					1600...
1601-8-5 N	■	□	□	8	5	6	16					1600...
1601-3-4 N P*	□	□	□	3	4	6	14					1600...
1601-3-5 N P*	□	□	□	3	5	6	16					1600...
1601-4-4 N P*	□	□	□	4	4	6	14					1600...
1601-6-5 N P*	□	□	□	6	5	6	16					1600...
1601-8-5 N P*	□	□	□	8	5	6	16					1600...

* Hochglanz poliert | Poli miroir | Mirror polished



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide 			Dimensionen Dimensions Dimensions								Halter Porte-outil Holder
					a	c	x	z					
													
													
													
Typ 01													 80...
 Linke Ausführung Exécution gauche Left execution	 Rechte Ausführung Exécution droite Right execution	UHM 30 ⋮	UHM 30 SX ⋮	UHM 30 HX ⋮									
3001-3.5-10 L	3001-3.5-10 R				3.5	11	8	40.5					3000...
3001-3.6-17 L	3001-3.6-17 R				3.6	17	8	51.5					3000...
3001-3.5-10 L P*	3001-3.5-10 R P*				3.5	11	8	40.5					3000...
3001-3.6-17 L P*	3001-3.6-17 R P*				3.6	17	8	51.5					3000...

A close-up photograph of a metal wedge, likely made of steel, with two circular holes drilled through its center. The wedge is positioned horizontally, and the lighting highlights its metallic texture and the precision of the holes.



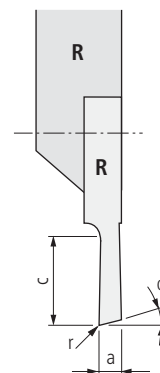
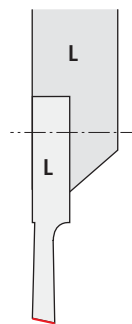
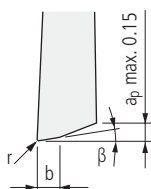
Bezeichnung Désignation Designation		Hartmetall Carbure Carbide			Dimensionen Dimensions Dimensions								Halter Porte-outil Holder
		88											
		●	●	●	a	c	x	z					
Typ 01		○	○	●									
		○	—	●									
		●	○	○									
N Neutrale Ausführung Exécution neutre Neutral execution		... UHM 30	... UHM 30 SX	... UHM 30 HX									84...
3601-6-10 N		■	□	□	6	11	8	40.5					
3601-6-10 N P*		□	□	□	6	11	8	40.5					

* Hochglanz poliert | Poli miroir | Mirror polished

Abstechen | Tronçonnage | Cut off



Detail «TOP»



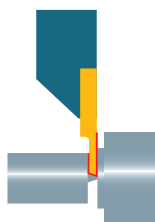
Bezeichnung Désignation Designation		Hartmetall Carbure Carbide			Dimensionen Dimensions Dimensions								Halter Porte-outil Holder
					a	c	α	r					
													
													
													
													
Typ 02													 67...
 Linke Ausführung Exécution gauche Left execution	 Rechte Ausführung Exécution droite Right execution	... UHM 30	... UHM 30 SX	... UHM 30 HX									
1602-0.5-2.5 L G20	1602-0.5-2.5 R G20				0.5	2.5	20°	0					1600...
1602-0.8-5 L	1602-0.8-5 R				0.8	5	15°	0					1600...
1602-1.0-5 L	1602-1.0-5 R				1	5	15°	0					1600...
1602-1.2-5 L	1602-1.2-5 R				1.2	5	15°	0					1600...
1602-1.5-5 L	1602-1.5-5 R				1.5	5	15°	0					1600...



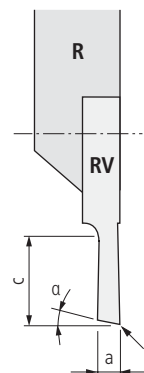
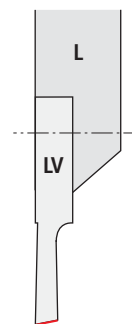
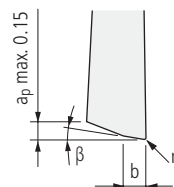
Bezeichnung Désignation Designation		Hartmetall Carbure Carbide 			Dimensionen Dimensions Dimensions								Halter Porte-outil Holder
Typ 02					a	c	α	r	β	b			 80...
													
													
													
 Linke Ausführung Exécution gauche Left execution	 Rechte Ausführung Exécution droite Right execution	UHM 30 ∴	UHM 30 SX ∴	UHM 30 HX ∴									
3002-0.8-6 L	3002-0.8-6 R				0.8	6	15°	0					3000...
3002-1.0-6 L	3002-1.0-6 R				1	6	15°	0					3000...
3002-1.2-6 L	3002-1.2-6 R				1.2	6	15°	0					3000...
3002-1.5-8 L	3002-1.5-8 R				1.5	8	15°	0					3000...
3002-1.8-8 L	3002-1.8-8 R				1.8	8	15°	0					3000...
3002-2.0-10 L	3002-2.0-10 R				2	10	15°	0					3000...
3002-2.0-10 L TOP 015	3002-2.0-10 R TOP 015				2	10	15°	0.15	1.5°	0.3			3000...
3002-2.5-13 L	3002-2.5-13 R				2.5	13	15°	0					3000...
3002-3.0-16 L	3002-3.0-16 R				3	16	15°	0					3000...

TOP: Längsdrehen auch möglich (siehe a_p max.) | Tournage aussi possible (voir a_p max.) | Turning also possible (see a_p max.)

Abstechen (versetzt) | Tronçonnage (déportée) | Cut off (offset)



Detail «TOP»



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide			Dimensionen Dimensions Dimensions							Halter Porte-outil Holder
		●	○	●	a	c	α	r				
Typ 02...V		○	○	○								□ 67...
L	R	...	...	...								
Linke Ausführung Exécution gauche Left execution	Rechte Ausführung Exécution droite Right execution	UHM 30	UHM 30 SX	UHM 30 HX								
1602-0.5-2.5 LV G20	1602-0.5-2.5 RV G20	■	□	■	0.5	2.5	20°	0				1600...
1602-0.8-5 LV	1602-0.8-5 RV	■	□	■	0.8	5	15°	0				1600...
1602-1.0-5 LV	1602-1.0-5 RV	■	□	■	1	5	15°	0				1600...
1602-1.2-5 LV	1602-1.2-5 RV	■	□	■	1.2	5	15°	0				1600...
1602-1.5-5 LV	1602-1.5-5 RV	■	□	■	1.5	5	15°	0				1600...

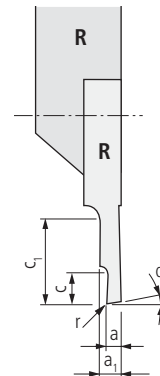
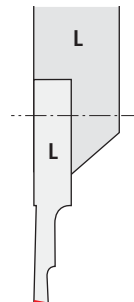


Bezeichnung Désignation Designation		Hartmetall Carbure Carbide			Dimensionen Dimensions Dimensions							Halter Porte-outil Holder
		●	○	●	a	c	α	r	β	b		
Typ 02...V		○	○	○								□ 80...
L	R	...	...	...								
Linke Ausführung Exécution gauche Left execution	Rechte Ausführung Exécution droite Right execution	UHM 30	UHM 30 SX	UHM 30 HX								
3002-0.8-6 LV	3002-0.8-6 RV	■	□	■	0.8	6	15°	0				3000...
3002-1.0-6 LV	3002-1.0-6 RV	■	□	■	1	6	15°	0				3000...
3002-1.2-6 LV	3002-1.2-6 RV	■	□	■	1.2	6	15°	0				3000...
3002-1.5-8 LV	3002-1.5-8 RV	■	□	■	1.5	8	15°	0				3000...
3002-1.8-8 LV	3002-1.8-8 RV	■	□	■	1.8	8	15°	0				3000...
3002-2.0-10 LV	3002-2.0-10 RV	■	□	■	2	10	15°	0				3000...
3002-2.0-10 LV TOP 015	3002-2.0-10 RV TOP 015	■	□	■	2	10	15°	0.15	1.5°	0.3		3000...
3002-2.5-13 LV	3002-2.5-13 RV	■	□	■	2.5	13	15°	0				3000...
3002-3.0-16 LV	3002-3.0-16 RV	■	□	■	3	16	15°	0				3000...

TOP: Längsdrehen auch möglich (siehe a_p max.) | Tournage aussi possible (voir a_p max.) | Turning also possible (see a_p max.)

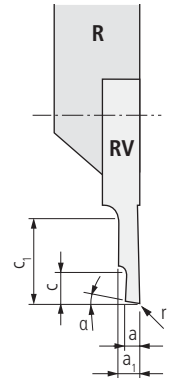
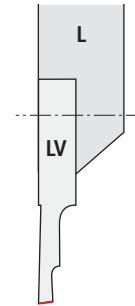
Abstechen nahe Gegenspindel | Tronçonnage près de la contre-broche | Cut off near the counter-spindle

38



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide			Dimensionen Dimensions Dimensions								Halter Porte-outil Holder
		●	●	●	a	a ₁	c	c ₁	α	r			
Typ 02...16		○	○	●									□ 80...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution											
		UHM 30	UHM 30 SX	UHM 30 HX									
3002-0.5-2.5-16 L G20	3002-0.5-2.5-16 R G20	■	□	■	0.5	1.9	2.5	16	20°	0			3000...
3002-0.8-6-16 L	3002-0.8-6-16 R	■	□	■	0.8	2	6	16	15°	0			3000...
3002-1.0-6-16 L	3002-1.0-6-16 R	■	□	■	1	2.2	6	16	15°	0			3000...
3002-1.2-6-16 L	3002-1.2-6-16 R	■	□	■	1.2	2.4	6	16	15°	0			3000...

Abstechen (versetzt) nahe Gegenspindel | Tronçonnage (déportée) près de la contre-broche | Cut off (offset) near the counter-spindle



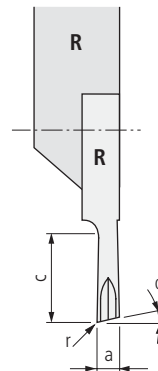
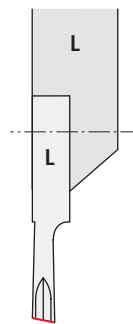
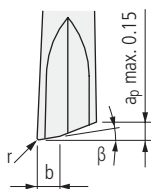
Bezeichnung Désignation Designation		Hartmetall Carbure Carbide			Dimensionen Dimensions Dimensions								Halter Porte-outil Holder
					a	a ₁	c	c ₁	α	r			
Typ 02...16 V													
 Linke Ausführung Exécution gauche Left execution	 Rechte Ausführung Exécution droite Right execution	...	...	...									
		UHM 30	UHM 30 SX	UHM 30 HX									
		...	...	...									
		...	...	...									
3002-0.5-2.5-16 LV G20	3002-0.5-2.5-16 RV G20				0.5	1.9	2.5	16	20°	0		3000...	
3002-0.8-6-16 LV	3002-0.8-6-16 RV				0.8	2	6	16	15°	0		3000...	
3002-1.0-6-16 LV	3002-1.0-6-16 RV				1	2.2	6	16	15°	0		3000...	
3002-1.2-6-16 LV	3002-1.2-6-16 RV				1.2	2.4	6	16	15°	0		3000...	

Abstechen | Tronçonnage | Cut off

40



Detail «TOP»



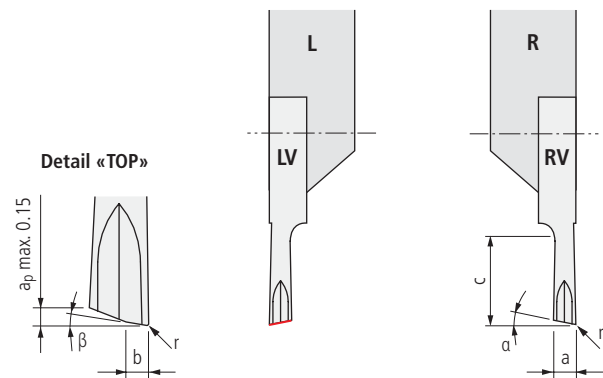
Bezeichnung Désignation Designation		Hartmetall Carbure Carbide			Dimensionen Dimensions Dimensions								Halter Porte-outil Holder
		●	●	●	a	c	α	r					
Typ 02...SC		○	○	○									□ 67...
L	Linke Ausführung Exécution gauche Left execution	R	Rechte Ausführung Exécution droite Right execution										
					... UHM 30	... UHM 30 SX	... UHM 30 HX						
1602-1.5-5 L SC	1602-1.5-5 R SC	■	□	■	1.5	5	15°	0					1600...



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide			Dimensionen Dimensions Dimensions								Halter Porte-outil Holder
		●	●	●	a	c	α	r	β	b			
Typ 02...SC		○	○	○									□ 80...
L	Linke Ausführung Exécution gauche Left execution	R	Rechte Ausführung Exécution droite Right execution										
					... UHM 30	... UHM 30 SX	... UHM 30 HX						
3002-1.5-8 L SC	3002-1.5-8 R SC	■	□	■	1.5	8	15°	0					3000...
3002-2.0-10 L SC	3002-2.0-10 R SC	■	□	■	2	10	15°	0					3000...
3002-2.0-10 L SC TOP 015	3002-2.0-10 R SC TOP 015	■	□	■	2	10	15°	0.15	1.5°	0.3			3000...
3002-2.5-13 L SC	3002-2.5-13 R SC	■	□	■	2.5	13	15°	0					3000...
3002-3.0-16 L SC	3002-3.0-16 R SC	■	□	■	3	16	15°	0					3000...

TOP: Längsdrehen auch möglich (siehe a_p max.) | Tournage aussi possible (voir a_p max.) | Turning also possible (see a_p max.)

Abstechen (versetzt) | Tronçonnage (déportée) | Cut off (offset)



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide			Dimensionen Dimensions Dimensions								Halter Porte-outil Holder
		●	○	●	a	c	α	r					
Typ 02...V SC		○	○	●									□ 67...
L Linke Ausführung Exécution gauche Left execution	R Rechte Ausführung Exécution droite Right execution	...	...	...									
1602-1.5-5 LV SC	1602-1.5-5 RV SC	■	□	■	1.5	5	15°	0					1600...

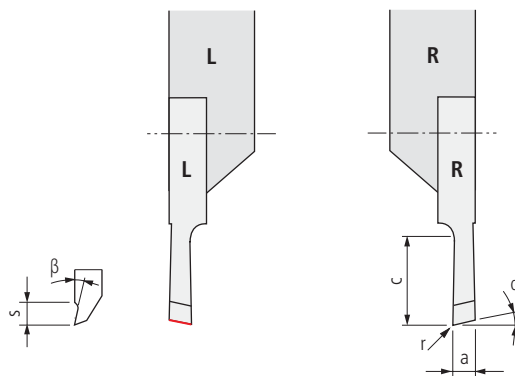


Bezeichnung Désignation Designation		Hartmetall Carbure Carbide			Dimensionen Dimensions Dimensions								Halter Porte-outil Holder
		●	○	●	a	c	α	r	β	b			
Typ 02...V SC		○	○	●									□ 80...
L Linke Ausführung Exécution gauche Left execution	R Rechte Ausführung Exécution droite Right execution	...	...	...									
3002-1.5-8 LV SC	3002-1.5-8 RV SC	■	□	■	1.5	8	15°	0					3000...
3002-2.0-10 LV SC	3002-2.0-10 RV SC	■	□	■	2	10	15°	0					3000...
3002-2.0-10 LV SC TOP 015	3002-2.0-10 RV SC TOP 015	■	□	■	2	10	15°	0.15	1.5°	0.3			3000...
3002-2.5-13 LV SC	3002-2.5-13 RV SC	■	□	■	2.5	13	15°	0					3000...
3002-3.0-16 LV SC	3002-3.0-16 RV SC	■	□	■	3	16	15°	0					3000...

TOP: Längsdrehen auch möglich (siehe a_p max.) | Tournage aussi possible (voir a_p max.) | Turning also possible (see a_p max.)

Abstechen | Tronçonnage | Cut off

42

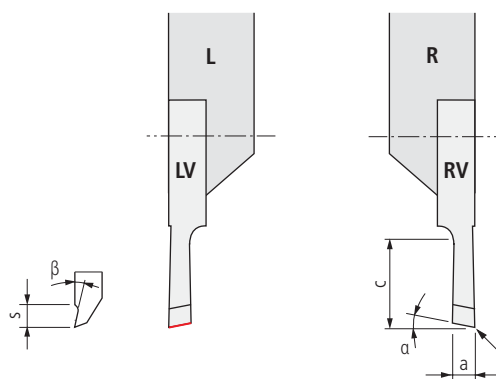
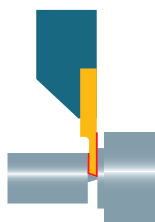


Bezeichnung Désignation Designation		Hartmetall Carbure Carbide			Dimensionen Dimensions Dimensions							Halter Porte-outil Holder
		●	●	●	a	c	α	β	r	s		
Typ 02 ...SPT		○	○	○								□ 67...
L Linke Ausführung Exécution gauche Left execution	R Rechte Ausführung Exécution droite Right execution	...	...	...								
1602-0.5-2.5 L SPT G20	1602-0.5-2.5-R SPT G20	■	□	■	0.5	2.5	20°	30°	0	2		1600...
1602-0.8-5 L SPT	1602-0.8-5 R SPT	■	□	■	0.8	5	15°	30°	0	2		1600...
1602-1.0-5 L SPT	1602-1.0-5 R SPT	■	□	■	1	5	15°	30°	0	2		1600...
1602-1.2-5 L SPT	1602-1.2-5 R SPT	■	□	■	1.2	5	15°	30°	0	2		1600...
1602-1.5-5 L SPT	1602-1.5-5 R SPT	■	□	■	1.5	5	15°	30°	0	2		1600...



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide			Dimensionen Dimensions Dimensions							Halter Porte-outil Holder
		●	●	●	a	c	α	β	r	s		
Typ 02 ...SPT		○	○	○								□ 80...
L Linke Ausführung Exécution gauche Left execution	R Rechte Ausführung Exécution droite Right execution	...	...	...								
3002-1.5-8 L SPT	3002-1.5-8 R SPT	■	□	■	1.5	8	15°	20°	0	2		3000...
3002-2.0-10 L SPT	3002-2.0-10 R SPT	■	□	■	2	10	15°	20°	0	2		3000...
3002-2.5-13 L SPT	3002-2.5-13 R SPT	□	□	□	2.5	13	15°	20°	0	2		3000...
3002-3.0-16 L SPT	3002-3.0-16 R SPT	□	□	□	3	16	15°	20°	0	2		3000...

Abstechen (versetzt) | Tronçonnage (déportée) | Cut off (offset)



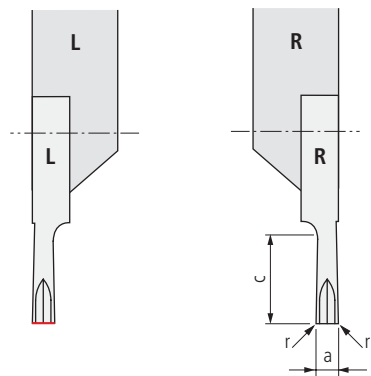
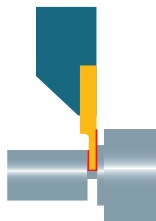
Bezeichnung Désignation Designation		Hartmetall Carbure Carbide □ 88			Dimensionen Dimensions Dimensions							Halter Porte-outil Holder
		●	●	●	a	c	a	β	r	s		□ 67...
Typ 02 ...V SPT		○	○	○								
L Linke Ausführung Exécution gauche Left execution R Rechte Ausführung Exécution droite Right execution		...	...	...								
1602-0.5-2.5 LV SPT G20	1602-0.5-2.5-RV SPT G20	■	□	■	0.5	2.5	20°	30°	0	2		1600...
1602-0.8-5 LV SPT	1602-0.8-5 RV SPT	■	□	■	0.8	5	15°	30°	0	2		1600...
1602-1.0-5 LV SPT	1602-1.0-5 RV SPT	■	□	■	1	5	15°	30°	0	2		1600...
1602-1.2-5 LV SPT	1602-1.2-5 RV SPT	■	□	■	1.2	5	15°	30°	0	2		1600...
1602-1.5-5 LV SPT	1602-1.5-5 RV SPT	■	□	■	1.5	5	15°	30°	0	2		1600...



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide □ 88			Dimensionen Dimensions Dimensions							Halter Porte-outil Holder
		●	●	●	a	c	a	β	r	s		□ 80...
Typ 02 ...V SPT		○	○	○								
L Linke Ausführung Exécution gauche Left execution R Rechte Ausführung Exécution droite Right execution		...	...	...								
3002-1.5-8 LV SPT	3002-1.5-8 RV SPT	■	□	■	1.5	8	15°	20°	0	2		3000...
3002-2.0-10 LV SPT	3002-2.0-10 RV SPT	■	□	■	2	10	15°	20°	0	2		3000...

Abstechen (neutral) | Tronçonnage (neutre) | Cut off (neutral)

44

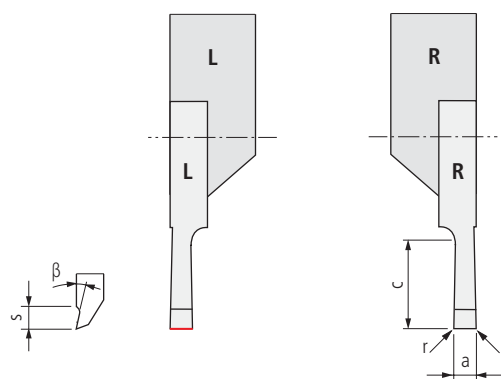
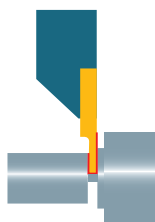


Bezeichnung Désignation Designation		Hartmetall Carbure Carbide			Dimensionen Dimensions Dimensions								Halter Porte-outil Holder
		●	○	●	a	c	r						
Typ 02...N SC		○	○	●									□ 67...
L	Rechte Ausführung Exécution droite Right execution	○	○	○									
R	Linke Ausführung Exécution gauche Left execution	○	○	○									
1602-1.5-5 LN SC	1602-1.5-5 RN SC	■	□	■	1.5	5	0.05						1600...



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide			Dimensionen Dimensions Dimensions								Halter Porte-outil Holder
		●	○	●	a	c	r						
Typ 02...N SC		○	○	●									□ 80...
L	Rechte Ausführung Exécution droite Right execution	○	○	○									
R	Linke Ausführung Exécution gauche Left execution	○	○	○									
3002-1.5-10 LN SC	3002-1.5-10 RN SC	■	□	■	1.5	10	0.08						3000...
3002-2.0-10 LN SC	3002-2.0-10 RN SC	■	□	■	2	10	0.08						3000...
3002-2.5-13 LN SC	3002-2.5-13 RN SC	■	□	■	2.5	13	0.08						3000...
3002-3.0-16 LN SC	3002-3.0-16 RN SC	■	□	■	3	16	0.08						3000...

Abstechen (neutral) | Tronçonnage (neutre) | Cut off (neutral)



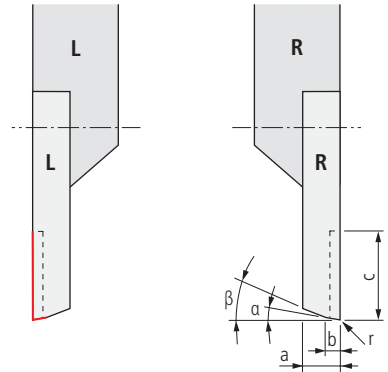
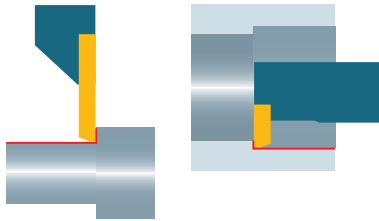
Bezeichnung Désignation Designation		Hartmetall Carbure Carbide			Dimensionen Dimensions Dimensions								Halter Porte-outil Holder
		●	○	●	a	c	r	s	β				
Typ 02 ...N SPT		○	○	○									□ 67...
L Linke Ausführung Exécution gauche Left execution	R Rechte Ausführung Exécution droite Right execution	...	...	...									
1602-0.5-2.5-LN SPT	1602-0.5-2.5-RN SPT	■	□	■	0.5	2.5	0.05	2	30°				1600...
1602-0.8-5 LN SPT	1602-0.8-5 RN SPT	■	□	■	0.8	5	0.05	2	30°				1600...
1602-1.0-5 LN SPT	1602-1.0-5 RN SPT	■	□	■	1	5	0.05	2	30°				1600...
1602-1.2-5 LN SPT	1602-1.2-5 RN SPT	■	□	■	1.2	5	0.05	2	30°				1600...
1602-1.5-5 LN SPT	1602-1.5-5 RN SPT	■	□	■	1.5	5	0.05	2	30°				1600...



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide			Dimensionen Dimensions Dimensions								Halter Porte-outil Holder
		●	○	●	a	c	r	s	β				
Typ 02 ...N SPT		○	○	○									□ 80...
L Linke Ausführung Exécution gauche Left execution	R Rechte Ausführung Exécution droite Right execution	...	...	...									
3002-1.5-10 LN SPT	3002-1.5-10 RN SPT	□	□	□	1.5	10	0.05	2	20°				3000...
3002-2.0-10 LN SPT	3002-2.0-10 RN SPT	□	□	□	2	10	0.05	2	20°				3000...
3002-2.5-13 LN SPT	3002-2.5-13 RN SPT	□	□	□	2.5	13	0.05	2	20°				3000...
3002-3.0-16 LN SPT	3002-3.0-16 RN SPT	□	□	□	3	16	0.05	2	20°				3000...

Vornedrehen | Tournage avant | Front turning

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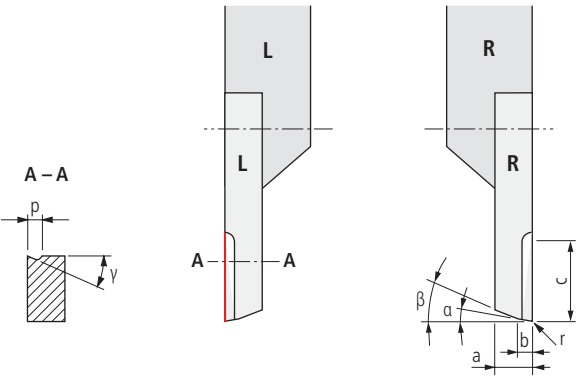
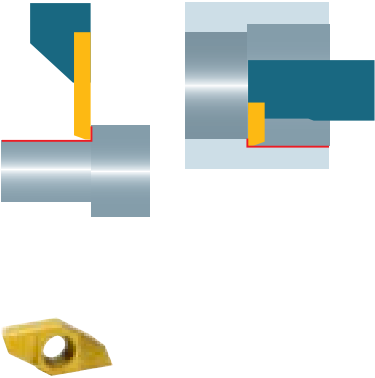


Bezeichnung Désignation Designation		Hartmetall Carbure Carbide			Dimensionen Dimensions Dimensions							Halter Porte-outil Holder
		●	○	●	a	b	c	α	β	r		
Typ 03		○	○	●								□ 67...
L Linke Ausführung Exécution gauche Left execution	R Rechte Ausführung Exécution droite Right execution	○	○	○								
1603-3.0-4 L	1603-3.0-4 R	■	□	■	3	1	4	3°	20°	0		1600...



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide			Dimensionen Dimensions Dimensions							Halter Porte-outil Holder
		●	○	●	a	b	c	α	β	r		
Typ 03		○	○	●								□ 80...
L Linke Ausführung Exécution gauche Left execution	R Rechte Ausführung Exécution droite Right execution	○	○	○								
3003-3.4-8 L	3003-3.4-8 R	■	□	■	3.4	1	8	3°	20°	0		3000...

Vornedrehen | Tournage avant | Front turning



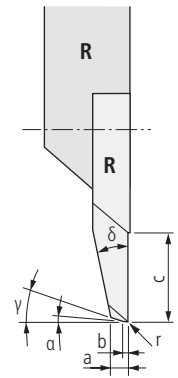
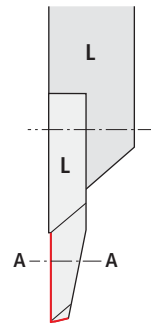
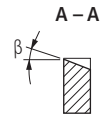
Bezeichnung Désignation Designation		Hartmetall Carbure Carbide			Dimensionen Dimensions Dimensions								Halter Porte-outil Holder
Typ 03...SP													
L	Linke Ausführung Exécution gauche Left execution	R	Rechte Ausführung Exécution droite Right execution	UHM 30 ... UHM 30 SX ... UHM 30 HX ...	a	b	c	a	β	r	p	γ	
1603-3.0-4 L SP U55003	1603-3.0-4 R SP U55003	■	□	■	3	0	4	0°	35°	0.03	1	12°	1600...



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide			Dimensionen Dimensions Dimensions								Halter Porte-outil Holder
					a	b	c	α	β	r	p	γ	
Typ 03...SP													
L	Linke Ausführung Exécution gauche Left execution	R	Rechte Ausführung Exécution droite Right execution	UHM 30 ... UHM 30 SX ... UHM 30 HX ...									
3003-3.4-8 L SP U	3003-3.4-8 R SP U				3.4	0.2	8	1°	8°	0	1.2	12°	3000...

Vornedrehen | Tournage avant | Front turning

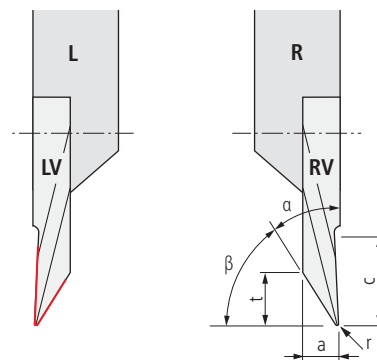
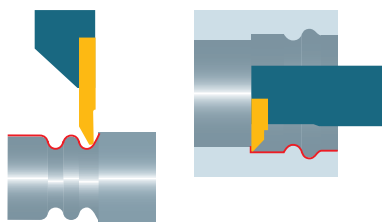
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Bezeichnung Désignation Designation		Hartmetall Carbure Carbide			Dimensionen Dimensions Dimensions								Halter Porte-outil Holder
		□ 88			a	b	c	α	β	γ	r	δ	
Typ 03 ...CP TOP*		●	●	●									□ 67...
		○	○	●									
		○	-	●									
		●	○	○									
L Linke Ausführung Exécution gauche Left execution	R Rechte Ausführung Exécution droite Right execution	UHM 30 ...	UHM 30 SX ...	UHM 30 HX ...									
1603-3.0-3.5 L CP TOP ZZ	1603-3.0-3.5 R CP TOP ZZ	■	□	■	0.8	0.2	4	1°	15°	2°	0	25°	1600...
1603-3.0-3.5 L CP TOP 003	1603-3.0-3.5 R CP TOP 003	■	□	■	0.8	0.2	4	1°	15°	2°	0.03	25°	1600...

* Beschreibung TOP | Description TOP | Description TOP □ 17

Kopierdrehen (vorne) | Tournage par copiage (avant) | Copy turning (front)



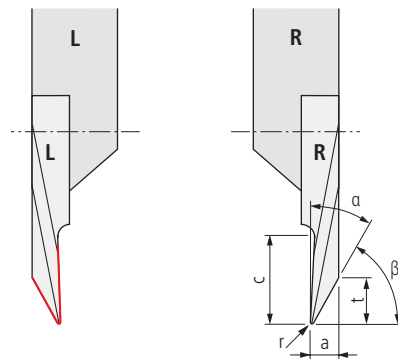
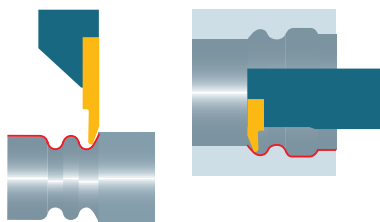
Bezeichnung Désignation Designation		Hartmetall Carbure Carbide			Dimensionen Dimensions Dimensions								Halter Porte-outil Holder
		●	●	●	a	c	a	β	r	t			
Typ 04 ...V SP		○	○	●									□ 67...
L	Linke Ausführung Exécution gauche Left execution	R	Rechte Ausführung Exécution droite Right execution										
		...	...	...									
1604-2.5-4-5 LV SP29005	1604-2.5-4-5 RV SP29005	■	□	■	2.5	5	29°	61°	0.05	4			1600...
1604-2.5-4-5 LV SP29015	1604-2.5-4-5 RV SP29015	■	□	■	2.5	5	29°	61°	0.15	4			1600...



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide			Dimensionen Dimensions Dimensions								Halter Porte-outil Holder
		●	●	●	a	c	a	β	r	t			
Typ 04 ...V SP		○	○	●									□ 80...
L	Linke Ausführung Exécution gauche Left execution	R	Rechte Ausführung Exécution droite Right execution										
		...	...	...									
3004-3.2-6 LV SP29008	3004-3.2-6 RV SP29008	■	□	■	3.2	6	29°	61°	0.08	5			3000...
3004-3.2-6 LV SP29015	3004-3.2-6 RV SP29015	■	□	■	3.2	6	29°	61°	0.15	5			3000...
3004-3.2-6 LV SP29035	3004-3.2-6 RV SP29035	■	□	■	3.2	6	29°	61°	0.35	5			3000...
3004-3.2-6 LV SP29075	3004-3.2-6 RV SP29075	■	□	■	3.2	6	29°	61°	0.75	5			3000...

Kopierdrehen (hinten) | Tournage par copiage (arrière) | Copy turning (back)

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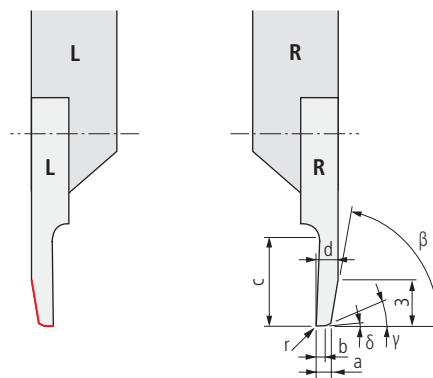
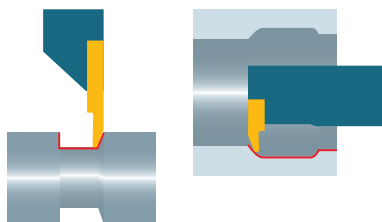


Bezeichnung Désignation Designation		Hartmetall Carbure Carbide			Dimensionen Dimensions Dimensions							Halter Porte-outil Holder
		●	●	●	a	c	α	β	r	t		
Typ 04 ...SP		○	○	○								□ 67...
L Linke Ausführung Exécution gauche Left execution	R Rechte Ausführung Exécution droite Right execution	...	...	...								
1604-1.25-2-3 L SP29005	1604-1.25-2-3 R SP29005	■	□	■	1.25	2.5	29°	61°	0.05	2		1600...
1604-2.5-4-5 L SP29005	1604-2.5-4-5 R SP29005	■	□	■	2.5	5	29°	61°	0.05	4		1600...
1604-2.5-4-5 L SP29015	1604-2.5-4-5 R SP29015	■	□	■	2.5	5	29°	61°	0.15	4		1600...



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide			Dimensionen Dimensions Dimensions							Halter Porte-outil Holder
		●	●	●	a	c	α	β	r	t		
Typ 04 ...SP		○	○	○								□ 80...
L Linke Ausführung Exécution gauche Left execution	R Rechte Ausführung Exécution droite Right execution	...	...	...								
3004-3.2-6 L SP29008	3004-3.2-6 R SP29008	■	□	■	3.2	6	29°	61°	0.08	5		3000...
3004-3.2-6 L SP29015	3004-3.2-6 R SP29015	■	□	■	3.2	6	29°	61°	0.15	5		3000...
3004-3.2-6 L SP29035	3004-3.2-6 R SP29035	■	□	■	3.2	6	29°	61°	0.35	5		3000...
3004-3.2-6 L SP29075	3004-3.2-6 R SP29075	■	□	■	3.2	6	29°	61°	0.75	5		3000...
3004-3.2-5 L SP35015	3004-3.2-5 R SP35015	■	□	■	3.2	5	35°	55°	0.15	4		3000...
3004-3.2-5 L SP35035	3004-3.2-5 R SP35035	■	□	■	3.2	5	35°	55°	0.35	4		3000...

Hintendrehen | Tournage arrière | Back turning



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide			Dimensionen Dimensions Dimensions								Halter Porte-outil Holder
		●	●	●	a	b	c	d	β	γ	r	δ	
		○	○	○									
		○	-	○									
		●	○	○									
Typ 04													□ 67...
L	Linke Ausführung Exécution gauche Left execution												
R	Rechte Ausführung Exécution droite Right execution												
		UHM 30	UHM 30 SX	UHM 30 HX									
1604-0.15-2 L	1604-0.15-2 R	■	□	■	0.15	0.05	2	1	70°	8°	0	0°	1600...
1604-0.2-2 L	1604-0.2-2 R	■	□	■	0.25	0.15	2	1	70°	8°	0.08	0°	1600...
1604-0.4-4 L	1604-0.4-4 R	■	□	■	0.4	0.15	4	1.6	70°	8°	0.08	0°	1600...
1604-0.8-4 L	1604-0.8-4 R	■	□	■	0.8	0.15	4	2	70°	8°	0.08	0°	1600...
1604-1.2-4 L	1604-1.2-4 R	■	□	■	1.2	0.5	4	2.4	70°	8°	0	1°	1600...

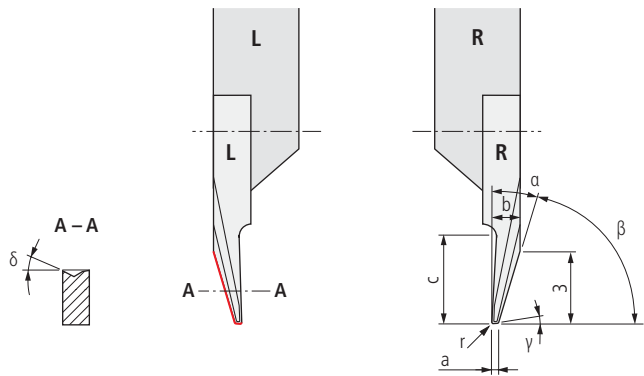
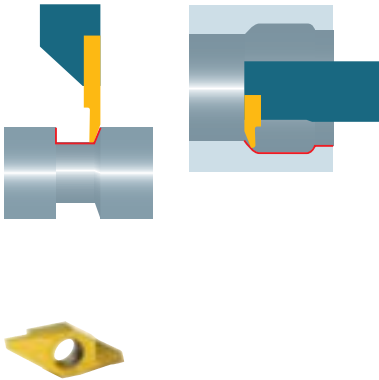


Bezeichnung Désignation Designation		Hartmetall Carbure Carbide			Dimensionen Dimensions Dimensions								Halter Porte-outil Holder
		●	●	●	a	b	c	d	β	γ	r	δ	
		○	○	○									
		○	-	○									
		●	○	○									
Typ 04													□ 80...
L	Linke Ausführung Exécution gauche Left execution												
R	Rechte Ausführung Exécution droite Right execution												
		UHM 30	UHM 30 SX	UHM 30 HX									
3004-0.8-6 L	3004-0.8-6 R	■	□	■	0.8	0.5	6	2	70°	8°	0	1°	3000...
3004-1.0-6 L	3004-1.0-6 R	■	□	■	1	0.5	6	2.2	70°	8°	0	1°	3000...
3004-1.2-8 L	3004-1.2-8 R	■	□	■	1.2	0.5	8	2.4	70°	8°	0	1°	3000...
3004-1.5-8 L	3004-1.5-8 R	■	□	■	1.5	0.5	8	2.7	70°	8°	0	1°	3000...
3004-1.8-8 L	3004-1.8-8 R	■	□	■	1.8	0.5	8	3	70°	8°	0	1°	3000...

Hintendrehen | Tournage arrière | Back turning

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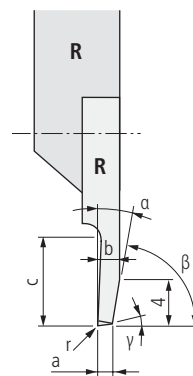
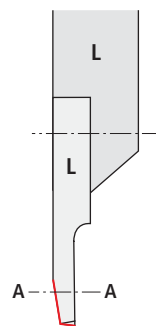
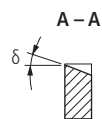
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Bezeichnung Désignation Designation		Hartmetall Carbure Carbide			Dimensionen Dimensions Dimensions								Halter Porte-outil Holder
					a	c	b	α	β	γ	δ	r	
Typ 04 ...TOP*													□ 67...
L	Linke Ausführung Exécution gauche Left execution												
R	Rechte Ausführung Exécution droite Right execution												
		UHM 30	UHM 30 SX	UHM 30 HX									
		...	...	...									
1604-1.5-3 L TOP 20ZZ	1604-1.5-3 R TOP 20ZZ	■	□	■	0.3	3	1.5	20°	70°	1.5°	15°	0	1600...
1604-1.5-3 L TOP 20005	1604-1.5-3 R TOP 20005	■	□	■	0.3	3	1.5	20°	70°	1.5°	15°	0.05	1600...

* Beschreibung TOP | Description TOP | Description TOP □ 17

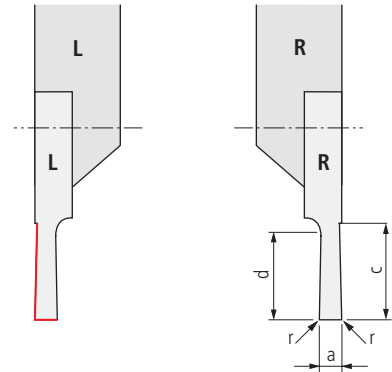
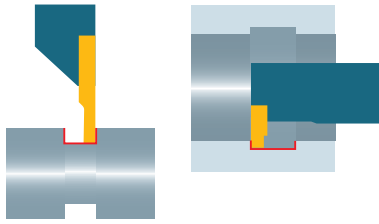
53



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide 			Dimensionen Dimensions Dimensions								Halter Porte-outil Holder
Typ 04 ...CP					a	b	c	α	β	γ	r	δ	
 Linke Ausführung Exécution gauche Left execution	 Rechte Ausführung Exécution droite Right execution												80...
3004-0.8-4 L CP	3004-0.8-4 R CP				0.8	3.2	4.5	20°	70°	2°	0	15°	3000...

Einstecken und Längsdrehen | Rainurage et tournage | Grooving and turning

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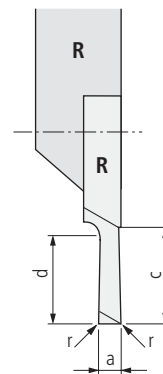
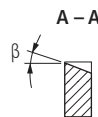
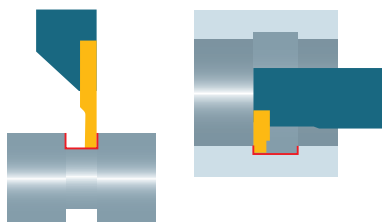


Bezeichnung Désignation Designation		Hartmetall Carbure Carbide			Dimensionen Dimensions Dimensions								Halter Porte-outil Holder
		●	●	●	a	c	d	r					
Typ 05		○	○	○									□ 67...
L	Linke Ausführung Exécution gauche Left execution	R	Rechte Ausführung Exécution droite Right execution										
		... UHM 30	... UHM 30 SX	... UHM 30 HX									
1605-0.5-1.5 L	1605-0.5-1.5 R	■	□	■	0.5	1.5	1.5	0.05					1600...
1605-1.0-2.5 L	1605-1.0-2.5 R	■	□	■	1	2.5	2.5	0.05					1600...
1605-1.5-3 L	1605-1.5-3 R	■	□	■	1.5	3	3	0.05					1600...



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide			Dimensionen Dimensions Dimensions								Halter Porte-outil Holder
		●	●	●	a	c	d	r					
Typ 05		○	○	○									□ 80...
L	Linke Ausführung Exécution gauche Left execution	R	Rechte Ausführung Exécution droite Right execution										
		... UHM 30	... UHM 30 SX	... UHM 30 HX									
3005-1.0-8 L	3005-1.0-8 R	■	□	■	1	8	2.5	0.05					3000...
3005-1.5-8 L	3005-1.5-8 R	■	□	■	1.5	8	3	0.05					3000...
3005-2.0-8 L	3005-2.0-8 R	■	□	■	2	8	4	0.05					3000...
3005-2.5-8 L	3005-2.5-8 R	■	□	■	2.5	8	5	0.05					3000...

Einstecken und Längsdrehen | Rainurage et tournage | Grooving and turning



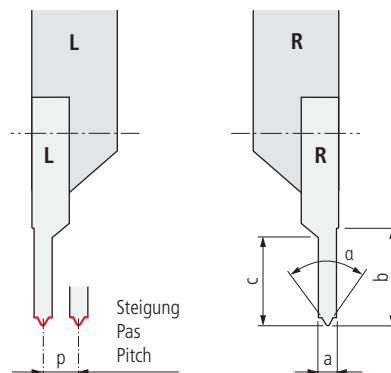
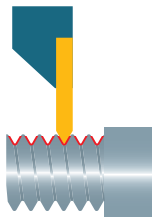
Bezeichnung Désignation Designation		Hartmetall Carbure Carbide			Dimensionen Dimensions Dimensions						Halter Porte-outil Holder
		●	○	●	a	c	d	r	β		
Typ 05 ...CP		○	○	○							□ 67...
L	R	...	...	...							
Linke Ausführung Exécution gauche Left execution	Rechte Ausführung Exécution droite Right execution	UHM 30	UHM 30 SX	UHM 30 HX							
1605-0.8-2.5 L CP	1605-0.8-2.5 R CP	■	□	■	0.8	2.5	2.5	0	15°		1600...
1605-1.0-3.5 L CP	1605-1.0-3.5 R CP	■	□	■	1	3.5	3.5	0	15°		1600...
1605-1.0-3.5 L CP R05	1605-1.0-3.5 R CP R05	■	□	■	1	3.5	3.5	0.05	15°		1600...
1605-1.5-3.5 L CP	1605-1.5-3.5 R CP	■	□	■	1.5	3.5	3.5	0	15°		1600...
1605-1.5-3.5 L CP R08	1605-1.5-3.5 R CP R08	■	□	■	1.5	3.5	3.5	0.08	15°		1600...
1605-2.0-3.5 L CP	1605-2.0-3.5 R CP	■	□	■	2	3.5	3.5	0	15°		1600...
1605-2.0-3.5 L CP R08	1605-2.0-3.5 R CP R08	■	□	■	2	3.5	3.5	0.08	15°		1600...
1605-2.5-3.5 L CP	1605-2.5-3.5 R CP	■	□	■	2.5	3.5	3.5	0	15°		1600...
1605-3.0-3.5 L CP	1605-3.0-3.5 R CP	□	□	□	3	3.5	3.5	0	15°		1600...



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide			Dimensionen Dimensions Dimensions						Halter Porte-outil Holder
		●	○	●	a	c	d	r	β		
Typ 05 ...CP		○	○	○							□ 80...
L	R	...	...	...							
Linke Ausführung Exécution gauche Left execution	Rechte Ausführung Exécution droite Right execution	UHM 30	UHM 30 SX	UHM 30 HX							
3005-0.8-8 L CP	3005-0.8-8 R CP	□	□	□	0.8	8	2.5	0	10°		3000...
3005-1.0-8 L CP	3005-1.0-8 R CP	□	□	□	1	8	3.5	0	10°		3000...
3005-1.5-8 L CP	3005-1.5-8 R CP	■	□	■	1.5	8	4	0	10°		3000...
3005-1.5-8 L CP R08	3005-1.5-8 R CP R08	■	□	■	1.5	8	4	0.08	10°		3000...
3005-2.0-8 L CP	3005-2.0-8 R CP	■	□	■	2	8	5	0	10°		3000...
3005-2.0-8 L CP R08	3005-2.0-8 R CP R08	■	□	■	2	8	5	0.08	10°		3000...
3005-2.0-8 L CP R15	3005-2.0-8 R CP R15	□	□	□	2	8	5	0.15	10°		3000...
3005-2.5-8 L CP	3005-2.5-8 R CP	■	□	■	2.5	8	6	0	10°		3000...
3005-2.5-8 L CP R08	3005-2.5-8 R CP R08	■	□	■	2.5	8	6	0.08	10°		3000...
3005-2.5-8 L CP R15	3005-2.5-8 R CP R15	□	□	□	2.5	8	6	0.15	10°		3000...
3005-3.0-8 L CP	3005-3.0-8 R CP	■	□	■	3	8	6	0	10°		3000...
3005-3.0-8 L CP R08	3005-3.0-8 R CP R08	□	□	□	3	8	6	0.08	10°		3000...
3005-3.0-8 L CP R15	3005-3.0-8 R CP R15	■	□	■	3	8	6	0.15	10°		3000...
3605-4.0-10 L CP	3605-4.0-10 R CP	■	□	■	4	10	10	0	10°		3600...
3605-4.0-10 L CP R15	3605-4.0-10 R CP R15	■	□	■	4	10	10	0.15	10°		3600...

Gewindedrehen (Vollprofil metrisch) | Filetage (profil complet metrique) | Threading (full profile metric)

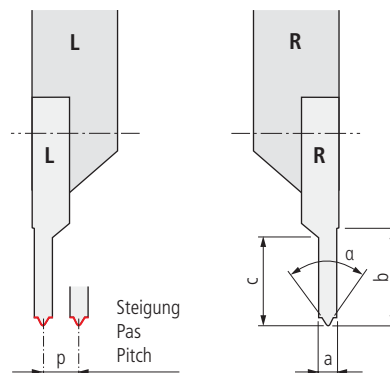
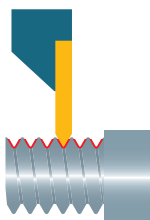
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Bezeichnung Désignation Designation		Hartmetall Carbure Carbide			Norm Norme Standard			Dimensionen Dimensions Dimensions					Halter Porte-outil Holder
		●	○	●	ISO DIN13	NIHS 06-03	NIHS 06-02	p	a	b	c	α	
Typ 06 ...VP		●	○	●									□ 67...
L Linke Ausführung Exécution gauche Left execution	R Rechte Ausführung Exécution droite Right execution	UHM 30	UHM 30 SX	UHM 30 HX									
1606-0.06-60 VP L	1606-0.06-60 VP R	■	□	■	—	—	S 0.2*	0.06	0.082	4	0	60°	1600...
1606-0.08-60 VP L	1606-0.08-60 VP R	■	□	■	—	—	S 0.3	0.08	0.12	4	0	60°	1600...
1606-0.09-60 VP L	1606-0.09-60 VP R	■	□	■	—	—	S 0.35	0.09	0.14	4	0	60°	1600...
1606-0.1-60 VP L	1606-0.1-60 VP R	■	□	■	—	—	S 0.4	0.1	0.16	4	0	60°	1600...
1606-0.125-60 VP L	1606-0.125-60 VP R	■	□	■	—	—	S 0.5	0.125	0.18	4	0	60°	1600...
1606-0.15-60 VP L	1606-0.15-60 VP R	■	□	■	—	—	S 0.6	0.15	0.22	4	0	60°	1600...
1606-0.175-60 VP L	1606-0.175-60 VP R	■	□	■	—	—	S 0.7	0.175	0.26	4	0	60°	1600...
1606-0.2-60 VP L	1606-0.2-60 VP R	■	□	■	—	—	S 0.8	0.2	0.3	4	0	60°	1600...
1606-0.225-60 VP L	1606-0.225-60 VP R	■	□	■	—	—	S 0.9	0.225	0.3	4	0	60°	1600...
1606-0.25-60 VP L	1606-0.25-60 VP R	■	□	■	M 1/1.2	M 1/1.2	S 1/1.2	0.25	0.36	4	0	60°	1600...
1606-0.3-60 VP L	1606-0.3-60 VP R	■	□	■	—	M 1.4	S 1.4	0.3	0.45	4	0	60°	1600...
1606-0.35-60 VP L	1606-0.35-60 VP R	■	□	■	M 1.6	M 1.6/1.8	—	0.35	0.5	4	0	60°	1600...
1606-0.4-60 VP L	1606-0.4-60 VP R	■	□	■	M 2	M 2	—	0.4	0.6	4	0	60°	1600...
1606-0.45-60 VP L	1606-0.45-60 VP R	■	□	■	M 2.5	M 2.2/2.5	—	0.45	0.64	4	0	60°	1600...
1606-0.5-60 VP L	1606-0.5-60 VP R	■	□	■	M 3	M 3	—	0.5	0.7	4	1.4	60°	1600...
1606-0.6-60 VP L	1606-0.6-60 VP R	■	□	■	—	M 3.5	—	0.6	0.8	4	1.4	60°	1600...
1606-0.7-60 VP L	1606-0.7-60 VP R	■	□	■	M 4	M 4	—	0.7	0.9	4	1.8	60°	1600...

* Normähnlich | Similaire à la norme | similar to the norme

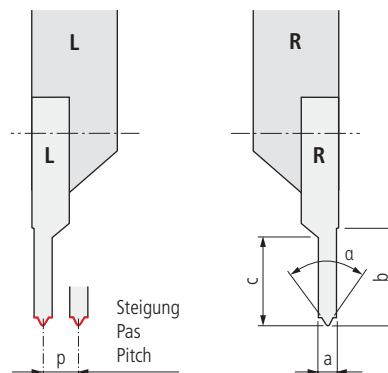
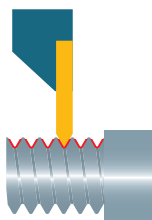
Gewindedrehen (Vollprofil metrisch) | Filetage (profil complet metrique) | Threading (full profile metric)



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide			Norm Norme Standard			Dimensionen Dimensions Dimensions					Halter Porte-outil Holder
		●	○	●	ISO DIN13	NIHS 06-03	NIHS 06-02	p	a	b	c	α	
Typ 06 ...VP		●	○	●									□ 80...
L Linke Ausführung Exécution gauche Left execution	R Rechte Ausführung Exécution droite Right execution	UHM 30	UHM 30 SX	UHM 30 HX									
3006-0.15-10-60 VP L	3006-0.15-10-60 VP R	□	□	□	—	—	S 0.6	0.15	0.22	8	0	60°	3000...
3006-0.175-10-60 VP L	3006-0.175-10-60 VP R	□	□	□	—	—	S 0.7	0.175	0.26	8	0	60°	3000...
3006-0.2-10-60 VP L	3006-0.2-10-60 VP R	□	□	□	—	—	S 0.8	0.2	0.3	8	0	60°	3000...
3006-0.225-10-60 VP L	3006-0.225-10-60 VP R	□	□	□	—	—	S 0.9	0.225	0.3	8	0	60°	3000...
3006-0.25-10-60 VP L	3006-0.25-10-60 VP R	□	□	□	M 1/1.2	M 1/1.2	S 1/S1.2	0.25	0.36	8	0	60°	3000...
3006-0.3-10-60 VP L	3006-0.3-10-60 VP R	□	□	□	—	M 1.4	S 1.4	0.3	0.45	8	0	60°	3000...
3006-0.35-10-60 VP L	3006-0.35-10-60 VP R	□	□	□	M 1.6	M 1.6/1.8	—	0.35	0.5	8	0	60°	3000...
3006-0.4-10-60 VP L	3006-0.4-10-60 VP R	□	□	□	M 2	M 2	—	0.4	0.6	8	0	60°	3000...
3006-0.45-10-60 VP L	3006-0.45-10-60 VP R	□	□	□	M 2.5	M 2.2/2.5	—	0.45	0.64	8	0	60°	3000...
3006-0.5-10-60 VP L	3006-0.5-10-60 VP R	■	□	■	M 3	M 3	—	0.5	0.7	8	1.4	60°	3000...
3006-0.6-10-60 VP L	3006-0.6-10-60 VP R	■	□	■	—	M 3.5	—	0.6	0.8	8	1.4	60°	3000...
3006-0.7-10-60 VP L	3006-0.7-10-60 VP R	■	□	■	M 4	M 4	—	0.7	0.9	8	1.8	60°	3000...
3006-0.75-10-60 VP L	3006-0.75-10-60 VP R	■	□	■	—	M 4.5	—	0.75	0.95	8	1.9	60°	3000...
3006-0.8-10-60 VP L	3006-0.8-10-60 VP R	■	□	■	M 5	M 5	—	0.8	1	8	2	60°	3000...
3006-1.0-10-60 VP L	3006-1.0-10-60 VP R	■	□	■	M 6/7	—	—	1	1.2	8	2.4	60°	3000...
3006-1.25-10-60 VP L	3006-1.25-10-60 VP R	■	□	■	M 8	—	—	1.25	1.45	8	2.9	60°	3000...
3006-1.5-10-60 VP L	3006-1.5-10-60 VP R	■	□	■	M 10/11	—	—	1.5	1.74	8	3.4	60°	3000...
3006-1.75-10-60 VP L	3006-1.75-10-60 VP R	■	□	■	M 12	—	—	1.75	1.95	8	3.9	60°	3000...

Gewindedrehen (Vollprofil UNC) | Filetage (profil complet UNC) | Threading (full profile UNC)

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Bezeichnung Désignation Designation		Hartmetall Carbure Carbide			Norm Norme Standard	Dimensionen Dimensions Dimensions						Halter Porte-outil Holder
		●	●	●		p (G/Zoll) (F/Pouce) (T/Inch)	p	a	b	c	α	
Typ 06 ...UNC ...VP		○	○	○	ANSI B1.1							□ 67...
L Linke Ausführung Exécution gauche Left execution	R Rechte Ausführung Exécution droite Right execution	...	...	...								
1606-01-64 UNC 60 VPL	1606-01-64 UNC 60 VPR	□	□	□	1-64	64	0.397	0.6	4	0	60°	1600...
1606-02-56 UNC 60 VPL	1606-02-56 UNC 60 VPR	□	□	□	2-56	56	0.453	0.64	4	0	60°	1600...
1606-03-48 UNC 60 VPL	1606-03-48 UNC 60 VPR	□	□	□	3-48	48	0.529	0.7	4	1.4	60°	1600...
1606-04-40 UNC 60 VPL	1606-04-40 UNC 60 VPR	□	□	□	4-40	40	0.635	0.9	4	1.8	60°	1600...
1606-05-40 UNC 60 VPL	1606-05-40 UNC 60 VPR	□	□	□	5-40	40	0.635	0.9	4	1.8	60°	1600...
1606-06-32 UNC 60 VPL	1606-06-32 UNC 60 VPR	□	□	□	6-32	32	0.794	1	4	2	60°	1600...
1606-08-32 UNC 60 VPL	1606-08-32 UNC 60 VPR	□	□	□	8-32	32	0.794	1	4	2	60°	1600...



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide			Norm Norme Standard	Dimensionen Dimensions Dimensions						Halter Porte-outil Holder
		●	●	●		p (G/Zoll) (F/Pouce) (T/Inch)	p	a	b	c	α	
Typ 06 ...UNC ...VP		○	○	○	ANSI B1.1							□ 80...
L Linke Ausführung Exécution gauche Left execution	R Rechte Ausführung Exécution droite Right execution	...	...	...								
3006-03-48 UNC 10-60 VPL	3006-03-48 UNC 10-60 VPR	□	□	□	3-48	48	0.529	0.7	8	1.4	60°	3000...
3006-04-40 UNC 10-60 VPL	3006-04-40 UNC 10-60 VPR	□	□	□	4-40	40	0.635	0.8	8	1.8	60°	3000...
3006-05-40 UNC 10-60 VPL	3006-05-40 UNC 10-60 VPR	□	□	□	5-40	40	0.635	0.9	8	1.8	60°	3000...
3006-06-32 UNC 10-60 VPL	3006-06-32 UNC 10-60 VPR	□	□	□	6-32	32	0.794	1	8	2	60°	3000...
3006-08-32 UNC 10-60 VPL	3006-08-32 UNC 10-60 VPR	□	□	□	8-32	32	0.794	1	8	2	60°	3000...
3006-10-24 UNC 10-60 VPL	3006-10-24 UNC 10-60 VPR	□	□	□	10-24	24	1.058	1.2	8	2.4	60°	3000...
3006-12-24 UNC 10-60 VPL	3006-12-24 UNC 10-60 VPR	□	□	□	12-24	24	1.058	1.2	8	2.4	60°	3000...
3006-1/4-20 UNC 10-60 VPL	3006-1/4-20 UNC 10-60 VPR	□	□	□	1/4-20	20	1.27	1.45	8	2.9	60°	3000...
3006-5/16-18 UNC 10-60 VPL	3006-5/16-18 UNC 10-60 VPR	□	□	□	5/16-18	18	1.411	1.74	8	3.4	60°	3000...
3006-3/8-16 UNC 10-60 VPL	3006-3/8-16 UNC 10-60 VPR	□	□	□	3/8-16	16	1.587	1.94	8	3.6	60°	3000...
3006-7/16-14 UNC 10-60 VPL	3006-7/16-14 UNC 10-60 VPR	□	□	□	7/16-14	14	1.814	2	8	3.9	60°	3000...
3006-1/2-13 UNC 10-60 VPL	3006-1/2-13 UNC 10-60 VPR	□	□	□	1/2-13	13	1.954	2.2	8	4.2	60°	3000...

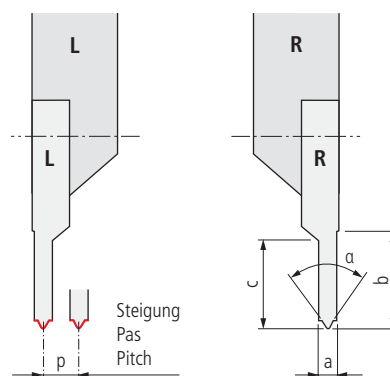
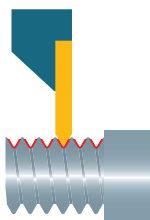
Anwendungsempfehlungen für Anzahl Durchgänge beim Gewindeschneiden □ 88

Recommandations indicatives sur le nombre de passes pour la réalisation d'un filetage □ 88

Application recommendation for number of passes at threading □ 88

Legende | Légende | Legend □ 4

Gewindedrehen (Vollprofil UNF) | Filetage (profil complet UNF) | Threading (full profile UNF)



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide			Norm Norme Standard		Dimensionen Dimensions Dimensions						Halter Porte-outil Holder
		●	●	●	ANSI B1.1		p (G/Zoll) (F/Pouce) (T/Inch)	p	a	b	c	α	
Typ 06 ...UNF ...VP		○	○	○									□ 67...
L Linke Ausführung Exécution gauche Left execution	R Rechte Ausführung Exécution droite Right execution	...	...	...									
1606-00-80 UNF 60 VPL	1606-00-80 UNF 60 VPR	□	□	□	0-80		80	0.317	0.45	4	0	60°	1600...
1606-01-72 UNF 60 VPL	1606-01-72 UNF 60 VPR	□	□	□	1-72		72	0.353	0.52	4	0	60°	1600...
1606-02-64 UNF 60 VPL	1606-02-64 UNF 60 VPR	□	□	□	2-64		64	0.397	0.6	4	0	60°	1600...
1606-03-56 UNF 60 VPL	1606-03-56 UNF 60 VPR	□	□	□	3-56		56	0.453	0.64	4	0	60°	1600...
1606-04-48 UNF 60 VPL	1606-04-48 UNF 60 VPR	□	□	□	4-48		48	0.529	0.7	4	1.4	60°	1600...
1606-05-44 UNF 60 VPL	1606-05-44 UNF 60 VPR	□	□	□	5-44		44	0.577	0.8	4	1.4	60°	1600...
1606-06-40 UNF 60 VPL	1606-06-40 UNF 60 VPR	□	□	□	6-40		40	0.635	0.9	4	1.8	60°	1600...
1606-08-36 UNF 60 VPL	1606-08-36 UNF 60 VPR	□	□	□	8-36		36	0.705	0.9	4	1.8	60°	1600...
1606-10-32 UNF 60 VPL	1606-10-32 UNF 60 VPR	□	□	□	10-32		32	0.794	1	4	2	60°	1600...



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide			Norm Norme Standard		Dimensionen Dimensions Dimensions						Halter Porte-outil Holder
		●	●	●	ANSI B1.1		p (G/Zoll) (F/Pouce) (T/Inch)	p	a	b	c	α	
Typ 06 ...UNF ...VP		○	○	○									□ 80...
L Linke Ausführung Exécution gauche Left execution	R Rechte Ausführung Exécution droite Right execution	...	...	...									
3006-04-48 UNF 10-60 VPL	3006-04-48 UNF 10-60 VPR	□	□	□	4-48		48	0.529	0.7	8	1.4	60°	3000...
3006-05-44 UNF 10-60 VPL	3006-05-44 UNF 10-60 VPR	□	□	□	5-44		44	0.577	0.8	8	1.4	60°	3000...
3006-06-40 UNF 10-60 VPL	3006-06-40 UNF 10-60 VPR	□	□	□	6-40		40	0.635	0.9	8	1.8	60°	3000...
3006-08-36 UNF 10-60 VPL	3006-08-36 UNF 10-60 VPR	□	□	□	8-36		36	0.705	0.9	8	1.8	60°	3000...
3006-10-32 UNF 10-60 VPL	3006-10-32 UNF 10-60 VPR	□	□	□	10-32		32	0.794	1	8	2	60°	3000...
3006-12-28 UNF 10-60 VPL	3006-12-28 UNF 10-60 VPR	□	□	□	12-28		28	0.907	1.1	8	2.2	60°	3000...
3006-1/4-28 UNF 10-60 VPL	3006-1/4-28 UNF 10-60 VPR	□	□	□	1/4-28		28	0.907	1.1	8	2.2	60°	3000...
3006-5/16-24 UNF 10-60 VPL	3006-5/16-24 UNF 10-60 VPR	□	□	□	5/16-24		24	1.058	1.2	8	2.4	60°	3000...
3006-3/8-24 UNF 10-60 VPL	3006-3/8-24 UNF 10-60 VPR	□	□	□	3/8-24		24	1.058	1.2	8	2.4	60°	3000...
3006-7/16-20 UNF 10-60 VPL	3006-7/16-20 UNF 10-60 VPR	□	□	□	7/16-20		20	1.27	1.45	8	2.9	60°	3000...
3006-1/2-20 UNF 10-60 VPL	3006-1/2-20 UNF 10-60 VPR	□	□	□	1/2-20		20	1.27	1.45	8	2.9	60°	3000...

Anwendungsempfehlungen für Anzahl Durchgänge beim Gewindeschneiden □ 88

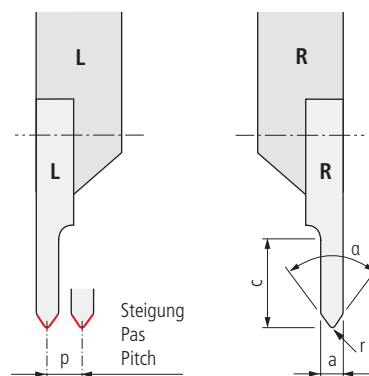
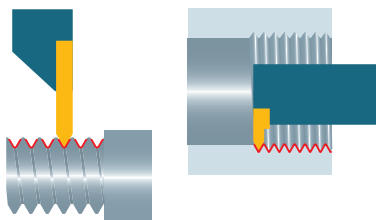
Recommandations indicatives sur le nombre de passes pour la réalisation d'un filetage □ 88

Application recommendation for number of passes at threading □ 88

Legende | Légende | Legend □ 4

Gewindedrehen (Teilprofil) | Filetage (profil partiel) | Threading (partial profile)

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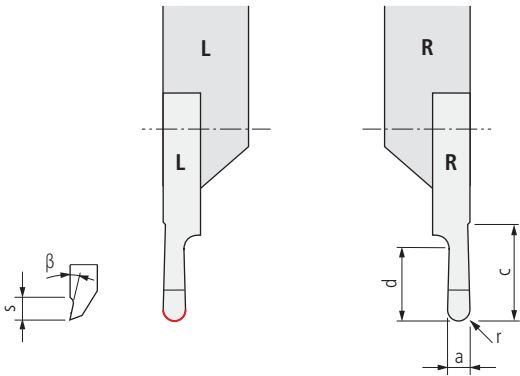
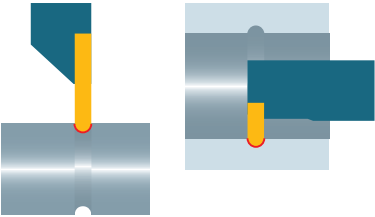


Bezeichnung Désignation Designation		Hartmetall Carbure Carbide			Dimensionen Dimensions Dimensions							Halter Porte-outil Holder
		●	●	●	p	a	c	α	r			
Typ 06		○	○	○					0/-0.02			□ 67...
L	R	UHM 30	UHM 30 SX	UHM 30 HX								
Linke Ausführung Exécution gauche Left execution	Rechte Ausführung Exécution droite Right execution	...	...	...								
1606-2-4-60 L	1606-2-4-60 R	■	□	■	0.25-2	2	4	60°	0.03			1600...
1606-2-4-55 L	1606-2-4-55 R	□	□	□	0.25-2	2	4	55°	0.03			1600...



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide			Dimensionen Dimensions Dimensions							Halter Porte-outil Holder
		●	●	●	p	a	c	α	r			
Typ 06		○	○	○					0/-0.02			□ 80...
L	R	UHM 30	UHM 30 SX	UHM 30 HX								
Linke Ausführung Exécution gauche Left execution	Rechte Ausführung Exécution droite Right execution	...	...	...								
3006-2-6-60 L	3006-2-6-60 R	■	□	■	0.25-2	2	6	60°	0.03			3000...
3006-2-6-55 L	3006-2-6-55 R	□	□	□	0.25-2	2	6	55°	0.03			3000...
3006-3-10-60 L	3006-3-10-60 R	■	□	■	0.25-2	3	10	60°	0.03			3000...
3006-3-10-55 L	3006-3-10-55 R	■	□	■	0.25-2	3	10	55°	0.03			3000...

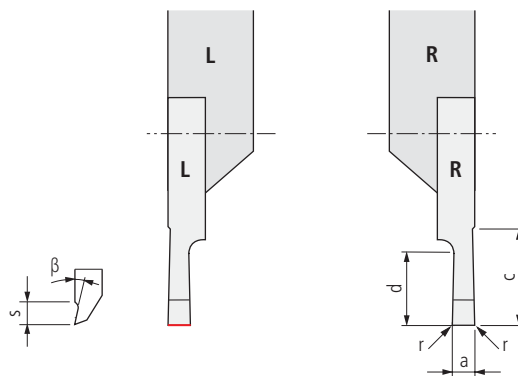
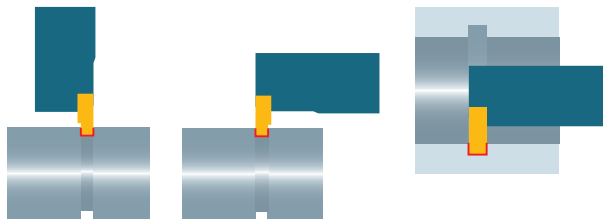
Radius-Einstich | Rainurage-rayonnage | Radius-grooving



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide			Dimensionen Dimensions Dimensions								Halter Porte-outil Holder
		□ 88			a	c	d	β	r	s			
		●	●	●									
		○	○	●									
Typ 07		○	—	●									□ 67...
L	Linke Ausführung Exécution gauche Left execution	R	Rechte Ausführung Exécution droite Right execution	UHM 30 ...	UHM 30 SX ...	UHM 30 HX ...							
1607-R0.25-2 L	1607-R0.25-2 R	■	□	■	0.5	4	2	6°	0.25	2			1600...
1607-R0.5-2.5 L	1607-R0.5-2.5 R	■	□	■	1	4	2.5	6°	0.5	2			1600...
1607-R0.6-2.5 L	1607-R0.6-2.5 R	□	□	□	1.2	4	2.5	6°	0.6	2			1600...
1607-R0.75-3 L	1607-R0.75-3 R	■	□	■	1.5	4	3	6°	0.75	2			1600...
1607-R0.8-3 L	1607-R0.8-3 R	□	□	□	1.6	4	3	6°	0.8	2			1600...
1607-R1.0-4 L	1607-R1.0-4 R	■	□	■	2	4	4	6°	1	2			1600...
1607-R1.5-4 L	1607-R1.5-4 R	■	□	■	3	4	4	6°	1.5	2			1600...

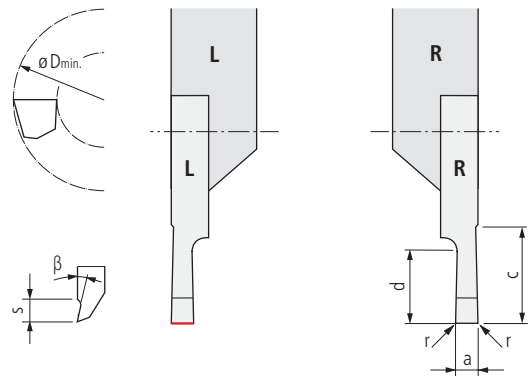
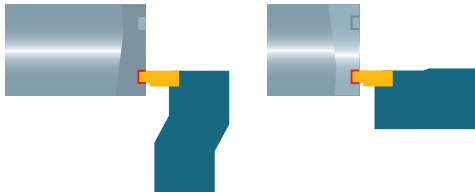
Einstecken (radial) | Rainurage (radial) | Grooving (radial)

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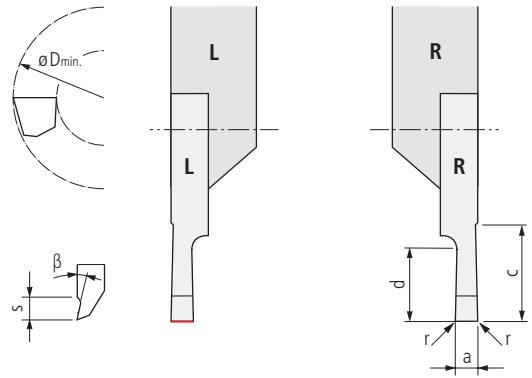
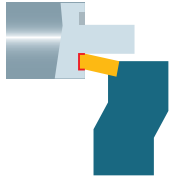
Bezeichnung Désignation Designation		Hartmetall Carbure Carbide			Norm Norme Standard	Dimensionen Dimensions Dimensions							Halter Porte-outil Holder
		●	●	●	ISO DIN	a	Tol.	r	c	d	β	s	
Typ 10		○	○	○									□ 67...
L	Rechte Ausführung Exécution droite Right execution	...	...	...									
R	Linke Ausführung Exécution gauche Left execution	...	...	...									
1610-0.05-0.1 L	1610-0.05-0.1 R	■	□	■	—	0.05	±0.01	0	4	0.1	6°	1	1600...
1610-0.1-0.2 L	1610-0.1-0.2 R	■	□	■	—	0.1	±0.01	0	4	0.2	6°	1	1600...
1610-0.15-0.3 L	1610-0.15-0.3 R	■	□	■	—	0.15	±0.01	0	4	0.3	6°	1	1600...
1610-0.24-0.5 L	1610-0.24-0.5 R	■	□	■	6799	0.24	+0.04/0	0	0.5	0.5	10°	3	1600...
1610-0.3-0.6 L	1610-0.3-0.6 R	■	□	■	—	0.3	±0.02	0	4	0.6	6°	1	1600...
1610-0.34-0.6 L	1610-0.34-0.6 R	■	□	■	6799	0.34	+0.04/0	0	0.6	0.6	10°	3	1600...
1610-0.4-0.8 L	1610-0.4-0.8 R	■	□	■	—	0.4	±0.02	0	4	0.8	6°	1	1600...
1610-0.44-0.8 L	1610-0.44-0.8 R	■	□	■	6799	0.44	+0.04/0	0	0.8	0.8	10°	3	1600...
1610-0.45-1.5 L	1610-0.45-1.5 R	□	□	□	—	0.45	±0.02	0	4	1.5	6°	1	1600...
1610-0.5-1.0 L	1610-0.5-1.0 R	■	□	■	—	0.5	±0.02	0	4	1	6°	1	1600...
1610-0.54-0.8 L	1610-0.54-0.8 R	■	□	■	6799	0.54	+0.05/0	0	0.8	0.8	10°	3	1600...
1610-0.6-1.2 L	1610-0.6-1.2 R	■	□	■	—	0.6	±0.02	0	4	1.2	6°	1	1600...
1610-0.64-1.0 L	1610-0.64-1.0 R	■	□	■	6799	0.64	+0.05/0	0	1	1	10°	3	1600...
1610-0.64-1.2 L	1610-0.64-1.2 R	■	□	■	6799	0.64	+0.05/0	0	1.2	1.2	10°	3	1600...
1610-0.65-0.7 L	1610-0.65-0.7 R	■	□	■	471	0.65	±0.02	0	0.7	0.7	10°	3	1600...
1610-0.7-1.4 L	1610-0.7-1.4 R	■	□	■	—	0.7	±0.02	0	4	1.4	6°	1	1600...
1610-0.74-1.8 L	1610-0.74-1.8 R	■	□	■	6799	0.74	+0.05/0	0	1.8	1.8	10°	3	1600...
1610-0.85-0.9 L	1610-0.85-0.9 R	■	□	■	471	0.85	±0.02	0	0.9	0.9	10°	3	1600...
1610-0.85-1.2 L	1610-0.85-1.2 R	□	□	□	—	0.85	±0.02	0	1.2	1.2	10°	3	1600...
1610-0.94-2.3 L	1610-0.94-2.3 R	■	□	■	6799	0.94	+0.05/0	0	2.3	2.3	10°	3	1600...
1610-0.95-1.0 L	1610-0.95-1.0 R	■	□	■	471	0.95	±0.02	0	1	1	10°	3	1600...
1610-1.0-1.14 L	1610-1.0-1.14 R	■	□	■	471	1	±0.02	0	1.14	1.14	10°	3	1600...
1610-1.05-2.3 L	1610-1.05-2.3 R	■	□	■	6799	1.05	+0.08/0	0	2.3	2.3	10°	3	1600...
1610-1.15-2.8 L	1610-1.15-2.8 R	■	□	■	6799	1.15	+0.08/0	0	2.8	2.8	10°	3	1600...
1610-1.2-1.34 L	1610-1.2-1.34 R	■	□	■	471/472	1.2	±0.02	0	1.34	1.34	10°	3	1600...
1610-1.25-2.8 L	1610-1.25-2.8 R	■	□	■	6799	1.25	+0.08/0	0	2.8	2.8	10°	3	1600...
1610-1.35-3.3 L	1610-1.35-3.3 R	■	□	■	6799	1.35	+0.08/0	0	3.3	3.3	10°	3	1600...
1610-1.4-1.53 L	1610-1.4-1.53 R	■	□	■	471/472	1.4	±0.02	0	1.53	1.53	10°	3	1600...
1610-1.55-3.8 L	1610-1.55-3.8 R	■	□	■	6799	1.55	+0.08/0	0	3.8	3.8	10°	3	1600...
1610-1.7-1.82 L	1610-1.7-1.82 R	■	□	■	471/472	1.7	±0.02	0	1.82	1.82	10°	3	1600...
1610-1.95-2.0 L	1610-1.95-2.0 R	■	□	■	471/472	1.95	±0.02	0	2	2	10°	3	1600...
1610-1.95-2.0 L R20	1610-1.95-2.0 R R20	□	□	□	—	1.95	±0.02	0.2	2	2	10°	3	1600...
1610-2.25-2.0 L	1610-2.25-2.0 R	■	□	■	471/472	2.25	±0.02	0	2	2	10°	3	1600...
1610-2.75-2.0 L	1610-2.75-2.0 R	■	□	■	471/472	2.75	±0.02	0	2	2	10°	3	1600...

Einstecken (axial) | Rainurage (axial) | Grooving (axial)



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide			Dimensionen Dimensions Dimensions							Halter Porte-outil Holder
		●	○	●	a	r	c	ϕD_{min}	d	β	s	
Typ 11		○	○	○	±0.02							□ 67...
L Linke Ausführung Exécution gauche Left execution												
R Rechte Ausführung Exécution droite Right execution												
		...	...	...								
1611-0.5-1 L	1611-0.5-1 R	■	□	■	0.5	0.05	1	8	1	8°	1.2	1600...
1611-0.8-1.5 L	1611-0.8-1.5 R	■	□	■	0.8	0.05	1.5	9	1.5	8°	1.2	1600...
1611-1.0-2 L	1611-1.0-2 R	■	□	■	1	0.05	2	10	2	8°	1.2	1600...
1611-1.5-2.5 L	1611-1.5-2.5 R	■	□	■	1.5	0.05	2.5	20	2.5	8°	1.2	1600...
1611-2.0-3 L	1611-2.0-3 R	■	□	■	2	0.05	3	30	3	8°	1.2	1600...
1611-2.5-3.5 L	1611-2.5-3.5 R	■	□	■	2.5	0.05	3.5	30	3.5	8°	1.2	1600...

Einstecken (axial) | Rainurage (axial) | Grooving (axial)



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide			Dimensionen Dimensions Dimensions								Halter Porte-outil Holder
		●	●	●	a	r	c	Ø D _{min.}	d	β	s		
Typ 11		○	○	●	±0.02							□ 77...	
L Linke Ausführung Exécution gauche Left execution	R Rechte Ausführung Exécution droite Right execution	...	...	...									
		UHM 30	UHM 30 SX	UHM 30 HX									
1711-0.5-1 L	1711-0.5-1 R	□	□	□	0.5	0.05	1	8	1	8°	1.2	1700...	
1711-0.8-1.5 L	1711-0.8-1.5 R	□	□	□	0.8	0.05	1.5	9	1.5	8°	1.2	1700...	
1711-1.0-2 L	1711-1.0-2 R	□	□	□	1	0.05	2	10	2	8°	1.2	1700...	
1711-1.5-2.5 L	1711-1.5-2.5 R	□	□	□	1.5	0.05	2.5	20	2.5	8°	1.2	1700...	
1711-2.0-3 L	1711-2.0-3 R	□	□	□	2	0.05	3	30	3	8°	1.2	1700...	
1711-2.5-3.5 L	1711-2.5-3.5 R	□	□	□	2.5	0.05	3.5	30	3.5	8°	1.2	1700...	

Kurzbeschreibung

Entwickeln und Produzieren von Multidec®-Werkzeugen für spezielle Anforderungen.

Notice explicative

Développer et fabriquer des outils Multidec® pour des exigences spéciales.

Description

Development and production of Multidec® tools especially for your needs.

Kundensituation

Eine besondere Bearbeitungssituation ist mit dem Multidec®-Standardprogramm nicht oder nicht so gut zu lösen. Dafür bräuchten Sie eine bestimmte Form der Schneide, eine Dimension oder Beschichtung, die es standardmässig nicht gibt.

Situation client

Un usage avec des exigences spéciales qui ne trouve pas de solutions dans notre gamme Multidec®. Cela peut-être une dimension, un revêtement, une forme ou un affûtage qui n'existe pas.

Customers situation

A special machining method makes it impossible or difficult to use tools from the standard Multidec® products. You should have a special insert, a special tool or coating which is not in our standard product range.

Utilis-Lösung

Nach einer gründlichen Beratung wird speziell auf Ihre Anforderungen hin das optimale Multidec®-Werkzeug entwickelt und produziert. In der Regel geschieht das auf der Basis der vorhandenen Rohlinge, sodass die Sonderanfertigungen rasch und kostengünstig geliefert werden können, in einer Qualität, die dem Standardprogramm in nichts nachsteht.

Solution Utilis

Après une étude personnalisée de votre problème, nous allons élaborer l'outil optimal en fonction de vos exigences. A partir d'ébauches de produits standards nous pourrons réaliser et livrer ces outils spéciaux dans des délais raisonnables et à des prix intéressants. Ces outils présenteront la même qualité que la gamme standard Multidec®.

Utilis solution

After a thorough consultation we will especially for you develop and produce the best Multidec® solution. Normally this will be made out of standard blanks, which makes it possible to realize and deliver the special tools within a short period of time and with a price favorable. And naturally with the known Multidec® quality.

Vorteile

- Utilis-Know-how und -Qualität auch für Sonderformen
- Durch vorhandene Rohlinge rasche und kostengünstige Lieferung
- Gezielte Neuentwicklung nach Kunden-Anforderungen möglich

Avantages

- Savoir-faire et qualité Utilis pour des fabrications spéciales
- Délais raccourcis et prix favorables à partir d'ébauches
- Développement spécial selon l'exigence du client

Advantages

- Utilis know-how and quality also for special tools
- With standard blanks fast delivered and with favorable price realized
- Development exactly according to your machining method

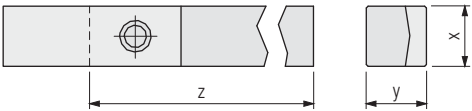
Typ 94/96/98/99



Standard | Standard | Standard

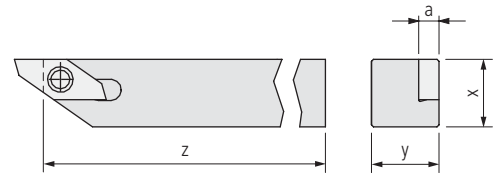
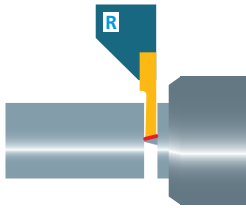
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UTILIS®
Tooling for High Technology



Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions										Schneiden Plaquettes Inserts
				x	y	z								
500...														□ 34...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution												
500-06×130 N	■	500-06×130 N	■	6	6	130								5...
500-07×130 L	■			7	7	130								5...
500-08×130 L	■	500-08×130 R	■	8	8	130								5...
500-10×130 L	□	500-10×130 R	□	10	10	130								5...

Standard | Standard | Standard

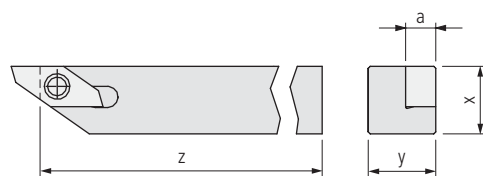
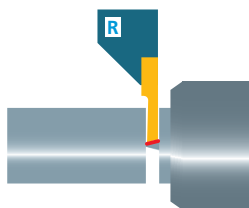


Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				x	y	z	a					
1600...												□ 36...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
1600-07×100 L	■	1600-07×100 R	■	7	7	100	3					16...
1600-07×150 L	□	1600-07×150 R	□	7	7	150	3					16...
1600-08×100 L	■	1600-08×100 R	■	8	8	100	3					16...
1600-08×150 L	□	1600-08×150 R	□	8	8	150	3					16...
1600-10×100 L	■	1600-10×100 R	■	10	10	100	3					16...
1600-10×150 L	□	1600-10×150 R	□	10	10	150	3					16...
1600-12×100 L	■	1600-12×100 R	■	12	12	100	3					16...
1600-12×150 L	□	1600-12×150 R	□	12	12	150	3					16...
1600-16×125 L	■	1600-16×125 R	■	16	16	125	3					16...
1600-16×150 L	□	1600-16×150 R	□	16	16	150	3					16...
1600-20×125 L	■	1600-20×125 R	■	20	20	125	3					16...
1600-20×150 L	□	1600-20×150 R	□	20	20	150	3					16...
1600-25×125 L	□	1600-25×125 R	□	25	25	125	3					16...

Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				x	y	z	a					
1600... INCH												□ 36...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
1600-3/8"×100 L	■	1600-3/8"×100 R	■	9.525	9.525	100	3					16...
1600-1/2"×100 L	■	1600-1/2"×100 R	■	12.7	12.7	100	3					16...
1600-5/8"×125 L	□	1600-5/8"×125 R	□	15.875	15.875	125	3					16...

Für Sonderschneiden mit grösserer Breite | Pour plaquettes spéciales avec plus grande largeur | For special inserts with greater breadth

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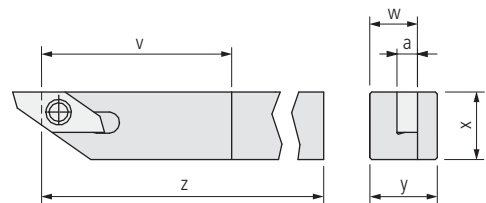


Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				x	y	z	a					
1600... 4												□ 65
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
1600-08×100-4 L	□	1600-08×100-4 R	□	8	8	100	4					1694...*
1600-10×100-4 L	■	1600-10×100-4 R	■	10	10	100	4					1694...*
1600-12×100-4 L	■	1600-12×100-4 R	■	12	12	100	4					1694...*
1600-16×125-4 L	□	1600-16×125-4 R	□	16	16	125	4					1694...*
1600-20×125-4 L	□	1600-20×125-4 R	□	20	20	125	4					1694...*
1600-25×125-4 L	□	1600-25×125-4 R	□	25	25	125	4					1694...*

Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				x	y	z	a					
1600... 6												□ 65
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
1600-10×100-6 L	□	1600-10×100-6 R	□	10	10	100	6					1696...*
1600-12×100-6 L	■	1600-12×100-6 R	■	12	12	100	6					1696...*
1600-16×125-6 L	■	1600-16×125-6 R	■	16	16	125	6					1696...*
1600-20×125-6 L	□	1600-20×125-6 R	□	20	20	125	6					1696...*
1600-25×125-6 L	□	1600-25×125-6 R	□	25	25	125	6					1696...*

Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				x	y	z	a					
1600... 8												□ 65
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
1600-12×100-8 L	□	1600-12×100-8 R	□	12	12	100	8					1698...*
1600-16×125-8 L	■	1600-16×125-8 R	■	16	16	125	8					1698...*
1600-20×125-8 L	□	1600-20×125-8 R	□	20	20	125	8					1698...*
1600-25×125-8 L	□	1600-25×125-8 R	□	25	25	125	8					1698...*

Mit abgesetztem Schaft und versetztem Plattensitz | Avec queue et siege de la plaquette déporté | With off-set shank and insert seat

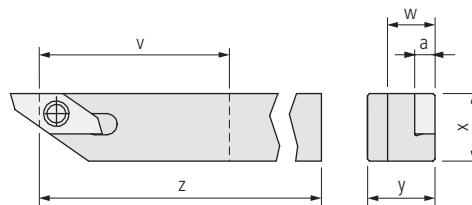
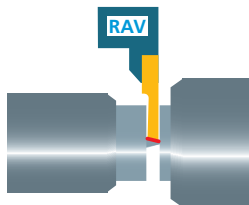


Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions							Schneiden Plaquettes Inserts
				x	y	z	v	w	a		
1600...A											□ 36...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution									
1600-08×100 LA	■	1600-08×100 RA	■	8	8	100	21	6	3		16...
1600-08×150 LA	□	1600-08×150 RA	□	8	8	150	21	6	3		16...
1600-10×100 LA	■	1600-10×100 RA	■	10	10	100	21	6	3		16...
1600-10×150 LA	□	1600-10×150 RA	□	10	10	150	21	6	3		16...
1600-12×100 LA	■	1600-12×100 RA	■	12	12	100	21	6	3		16...
1600-12×150 LA	□	1600-12×150 RA	□	12	12	150	21	6	3		16...

Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions							Schneiden Plaquettes Inserts
				x	y	z	v	w	a		
1600...A INCH											□ 36...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution									
1600-3/8"×100 LA	■	1600-3/8"×100 RA	■	9.525	9.525	100	21	6	3		16...
1600-1/2"×100 LA	■	1600-1/2"×100 RA	■	12.7	12.7	100	21	6	3		16...
1600-5/8"×125 LA	□	1600-5/8"×125 RA	□	15.875	15.875	125	21	6	3		16...

Mit abgesetztem Schaft | Avec queue déporté | With off-set shank

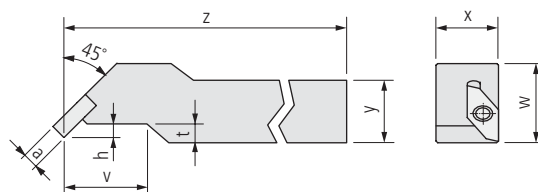
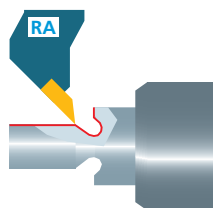
70



Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions							Schneiden Plaquettes Inserts
				x	y	z	v	w	a		
1600...AV											□ 36...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution									
1600-08×100 LAV	■	1600-08×100 RAV	■	8	8	100	21	6	3		16...
1600-08×150 LAV	□	1600-08×150 RAV	□	8	8	150	21	6	3		16...
1600-10×100 LAV	■	1600-10×100 RAV	■	10	10	100	21	6	3		16...
1600-10×150 LAV	□	1600-10×150 RAV	□	10	10	150	21	6	3		16...
1600-12×100 LAV	■	1600-12×100 RAV	■	12	12	100	21	6	3		16...
1600-12×150 LAV	□	1600-12×150 RAV	□	12	12	150	21	6	3		16...

Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions							Schneiden Plaquettes Inserts
				x	y	z	v	w	a		
1600...AV INCH											□ 36...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution									
1600-3/8"×100 LAV	■	1600-3/8"×100 RAV	■	9.525	9.525	100	21	6	3		16...
1600-1/2"×100 LAV	■	1600-1/2"×100 RAV	■	12.7	12.7	100	21	6	3		16...
1600-5/8"×125 LAV	□	1600-5/8"×125 RAV	□	15.875	15.875	125	21	6	3		16...

Mit abgesetztem Schaft | Avec queue déporté | With off-set shank



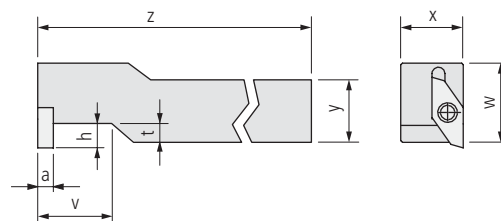
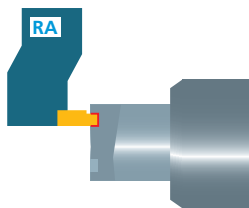
Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				x	y	z	v	w	h _{max.}	t	a	
1600... 45° ST...A												□ 36...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
1600-10×100 45 ST LA	□	1600-10×100 45 ST RA	□	10	10	100	17.5	13	2	2.5	3	16...*
1600-12×100 45 ST LA	□	1600-12×100 45 ST RA	□	12	12	100	17.5	13	2	2.5	3	16...*
1600-16×125 45 ST LA	□	1600-16×125 45 ST RA	□	16	16	125	17.5	13	2	2.5	3	16...*

Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				x	y	z	v	w	h _{max.}	t	a	
1600... 45° ST...A INCH												□ 36...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
1600-3/8"×100 45 ST LA	□	1600-3/8"×100 45 ST RA	□	9.525	9.525	100	17.5	13	2	2.5	3	16...*
1600-1/2"×100 45 ST LA	□	1600-1/2"×100 45 ST RA	□	12.7	12.7	100	17.5	13	2	2.5	3	16...*
1600-5/8"×125 45 ST LA	□	1600-5/8"×125 45 ST RA	□	15.875	15.875	125	17.5	13	2	2.5	3	16...*

*** Achtung | Attention | Attention**
Rechter Halter benötigt linke Schneide!
Outil à droite avec plaquette à gauche!
Right hand holder needs left hand insert!

Mit abgesetztem Schaft | Avec queue déporté | With off-set shank

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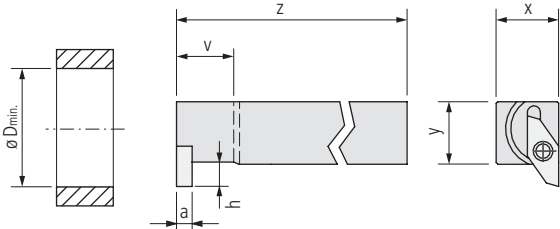
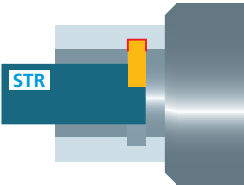


Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				x	y	z	v	w	h _{max.}	t	a	
1600... 90° ST...A												□ 36...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
1600-10×100 90 ST LA	■	1600-10×100 90 ST RA	■	10	10	100	17.5	14.5	4	4.5	3	16...*
1600-12×100 90 ST LA	■	1600-12×100 90 ST RA	■	12	12	100	17.5	14.5	4	4.5	3	16...*
1600-16×125 90 ST LA	■	1600-16×125 90 ST RA	■	16	16	125	17.5	14.5	4	4.5	3	16...*

Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				x	y	z	v	w	h _{max.}	t	a	
1600... 90° ST...A INCH												□ 36...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
1600-3/8"×100 90 ST LA	□	1600-3/8"×100 90 ST RA	□	9.525	9.525	100	17.5	14.5	4	4.5	3	16...*
1600-1/2"×100 90 ST LA	□	1600-1/2"×100 90 ST RA	□	12.7	12.7	100	17.5	14.5	4	4.5	3	16...*
1600-5/8"×125 90 ST LA	□	1600-5/8"×125 90 ST RA	□	15.875	15.875	125	17.5	14.5	4	4.5	3	16...*

*** Achtung | Attention | Attention**
Rechter Halter benötigt linke Schneide!
Outil à droite avec plaquette à gauche!
Right hand holder needs left hand insert!

Für Innenbearbeitung | Pour tournage intérieur | For internal turning



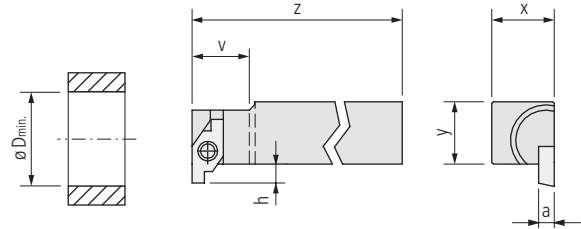
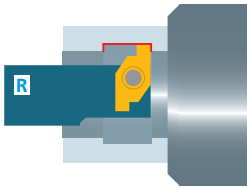
Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				x	y	z	v	h _{max}	Ø D _{min}	a		
1600... 90° ST												□ 36...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
1600-10×100 90 ST L	■	1600-10×100 90 ST R	■	10	10	100	11	4	20	3		16...*
1600-12×100 90 ST L	■	1600-12×100 90 ST R	■	12	12	100	11	4	20	3		16...*

*** Achtung | Attention | Attention**
Rechter Halter benötigt linke Schneide!
Outil à droite avec plaquette à gauche!
Right hand holder needs left hand insert!

Für Innenbearbeitung mit Sonderplatten | Pour tournage intérieur avec plaquettes spéciales | For internal turning with special inserts

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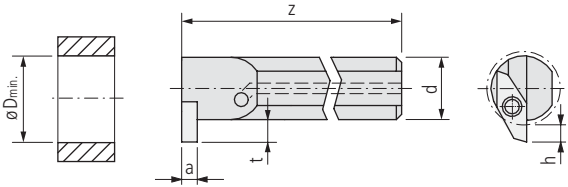
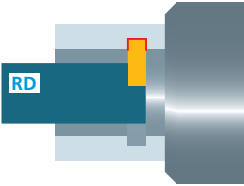
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Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				x	y	z	v	h _{max.}	Ø D _{min.}	a		
1600... 90°												□ 65
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
1600-10×100 90 L	■	1600-10×100 90 R	■	10	10	100	11	4	17	3		1699*
1600-12×100 90 L	■	1600-12×100 90 R	■	12	12	100	11	4	17	3		1699*

*** Achtung | Attention | Attention**
Rechter Halter benötigt linke Schneide!
Outil à droite avec plaquette à gauche!
Right hand holder needs left hand insert!

Für Innenbearbeitung | Pour tournage intérieur | For internal turning

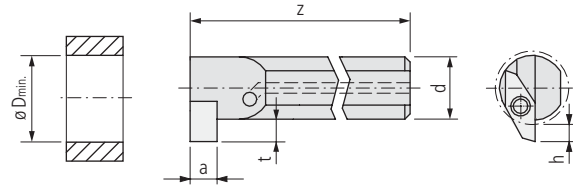
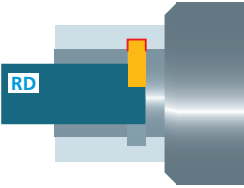


Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				d	z	h _{max.}	Ø D _{min.}	a	t			
1600... 90° RD				g6								□ 36...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
1600-12×125 RD L	■	1600-12×125 RD R	■	12	125	2	17	3	4			16...*
1600-16×150 RD L	■	1600-16×150 RD R	■	16	150	2.5	21	3	4			16...*
1600-20×180 RD L	■	1600-20×180 RD R	■	20	180	3	25	3	4			16...*

*** Achtung | Attention | Attention**
Rechter Halter benötigt linke Schneide!
Outil à droite avec plaquette à gauche!
Right hand holder needs left hand insert!

Für Sonderplatten mit grösserer Breite | Pour plaquettes spéciales avec plus grande largeur | For special inserts with greater breadth

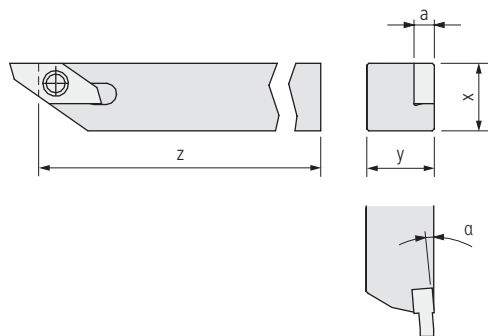
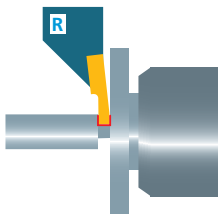
76



Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions							Schneiden Plaquettes Inserts
				d	z	h _{max.}	Ø D _{min.}	a	t		
1600... 90° -6-8				g6							□ 65
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution									
1600-16×150-6-8 RD L	☐	1600-16×150-6-8 RD R	☐	16	150	2.5	21	6	4		1696/98...*
1600-20×180-6-8 RD L	☐	1600-20×180-6-8 RD R	☐	20	180	3	25	6	4		1696/98...*

*** Achtung | Attention | Attention**
Rechter Halter benötigt linke Schneide!
Outil à droite avec plaquette à gauche!
Right hand holder needs left hand insert!

Standard | Standard | Standard

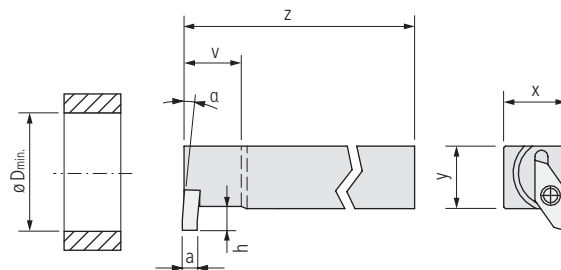
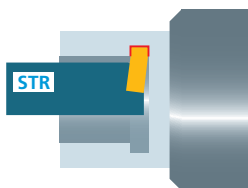


Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				x	y	z	a	α				
1700...												64
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
1700-08×100 L	☐	1700-08×100 R	☐	8	8	100	3	2°				17...
1700-10×100 L	☐	1700-10×100 R	☐	10	10	100	3	2°				17...
1700-12×100 L	☐	1700-12×100 R	☐	12	12	100	3	2°				17...
1700-16×125 L	☐	1700-16×125 R	☐	16	16	125	3	2°				17...
1700-20×125 L	☐	1700-20×125 R	☐	20	20	125	3	2°				17...

Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				x	y	z	a	α				
1700... INCH												64
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
1700-3/8"×100 L	☐	1700-3/8"×100 R	☐	9.525	9.525	100	3	2°				17...
1700-1/2"×100 L	☐	1700-1/2"×100 R	☐	12.7	12.7	100	3	2°				17...
1700-5/8"×125 L	☐	1700-5/8"×125 R	☐	15.85	15.85	125	3	2°				17...

Für Innenbearbeitung | Pour tournage intérieur | For internal turning

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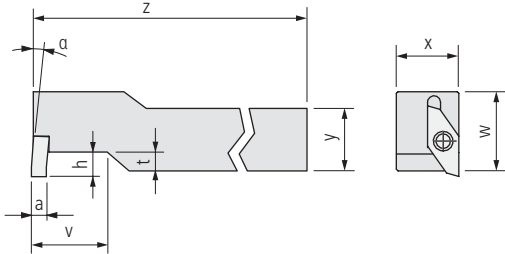
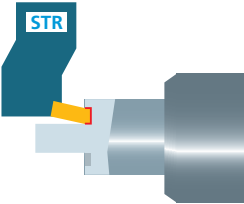


Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions							Schneiden Plaquettes Inserts	
				x	y	z	a	α	$\varnothing D_{min.}$			
1700... 92° ST											64	
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
1700-08×100 92 ST L	☐	1700-08×100 92 ST R	☐	8	8	100	3	2°	20		17...*	
1700-10×100 92 ST L	☐	1700-10×100 92 ST R	☐	10	10	100	3	2°	20		17...*	
1700-12×100 92 ST L	☐	1700-12×100 92 ST R	☐	12	12	100	3	2°	20		17...*	
1700-16×125 92 ST L	☐	1700-16×125 92 ST R	☐	16	16	125	3	2°	20		17...*	
1700-20×125 92 ST L	☐	1700-20×125 92 ST R	☐	20	20	125	3	2°	20		17...*	

Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions							Schneiden Plaquettes Inserts	
				x	y	z	a	α	$\varnothing D_{min.}$			
1700... 92° ST INCH											64	
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
1700-3/8"×100 92 ST L	☐	1700-3/8"×100 92 ST R	☐	9.525	9.525	100	3	2°	20		17...*	
1700-1/2"×100 92 ST L	☐	1700-1/2"×100 92 ST R	☐	12.7	12.7	100	3	2°	20		17...*	
1700-5/8"×125 92 ST L	☐	1700-5/8"×125 92 ST R	☐	15.85	15.85	125	3	2°	20		17...*	

*** Achtung | Attention | Attention**
Rechter Halter benötigt linke Schneide!
Outil à droite avec plaquette à gauche!
Right hand holder needs left hand insert!

Mit abgesetztem Schaft | Avec queue déporté | With off-set shank



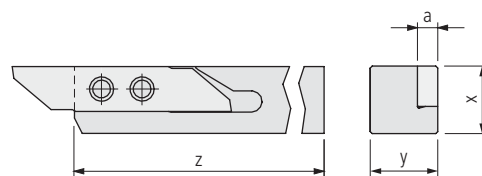
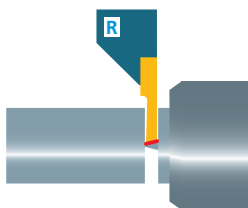
Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				x	y	z	a	α				
1700... 92° ST...A												64
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
1700-08×100 92 ST LA	☐	1700-08×100 92 ST RA	☐	8	8	100	3	2°				17...*
1700-10×100 92 ST LA	☐	1700-10×100 92 ST RA	☐	10	10	100	3	2°				17...*
1700-12×100 92 ST LA	☐	1700-12×100 92 ST RA	☐	12	12	100	3	2°				17...*
1700-16×125 92 ST LA	☐	1700-16×125 92 ST RA	☐	16	16	125	3	2°				17...*
1700-20×125 92 ST LA	☐	1700-20×125 92 ST RA	☐	20	20	125	3	2°				17...*

Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				x	y	z	a	α				
1700... 92° ST...A INCH												64
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
1700-1/2"×100 92 ST LA	☐	1700-1/2"×100 92 ST RA	☐	9.525	9.525	100	3	2°				17...*
1700-3/8"×100 92 ST LA	☐	1700-3/8"×100 92 ST RA	☐	12.7	12.7	100	3	2°				17...*
1700-5/8"×125 92 ST LA	☐	1700-5/8"×125 92 ST RA	☐	15.85	15.85	125	3	2°				17...*

*** Achtung | Attention | Attention**
Rechter Halter benötigt linke Schneide!
Outil à droite avec plaquette à gauche!
Right hand holder needs left hand insert!

Standard | Standard | Standard

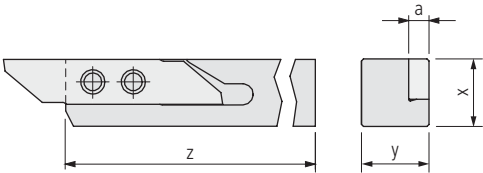
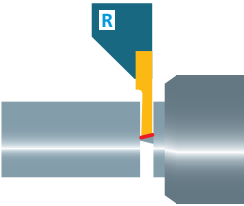
80



Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				x	y	z	a					
3000...												36...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
3000-08×100 L	■	3000-08×100 R	■	8	8	100	3.5					30...
3000-08×150 L	□	3000-08×150 R	□	8	8	150	3.5					30...
3000-10×100 L	■	3000-10×100 R	■	10	10	100	3.5					30...
3000-10×150 L	□	3000-10×150 R	□	10	10	150	3.5					30...
3000-12×100 L	■	3000-12×100 R	■	12	12	100	3.5					30...
3000-12×150 L	□	3000-12×150 R	□	12	12	150	3.5					30...
3000-16×125 L	■	3000-16×125 R	■	16	16	125	3.5					30...
3000-16×150 L	□	3000-16×150 R	□	16	16	150	3.5					30...
3000-20×125 L	■	3000-20×125 R	■	20	20	125	3.5					30...
3000-20×150 L	□	3000-20×150 R	□	20	20	150	3.5					30...
3000-25×150 L	□	3000-25×150 R	□	25	25	150	3.5					30...

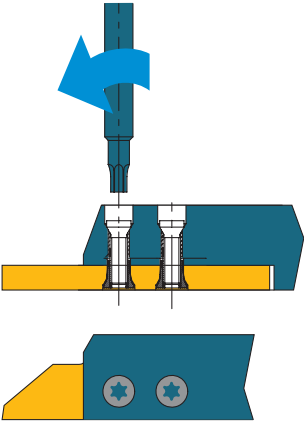
Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				x	y	z	a					
3000... INCH												36...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
3000-3/8"×100 L	■	3000-3/8"×100 R	■	9.525	9.525	100	3.5					30...
3000-1/2"×100 L	■	3000-1/2"×100 R	■	12.7	12.7	100	3.5					30...
3000-5/8"×125 L	□	3000-5/8"×125 R	□	15.85	15.85	125	3.5					30...

Spannung der Wendeplatte von der hinteren Seite | Serrage de la plaquette de l'arrière | Clamping of insert from the back side



Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				x	y	z	a					
3000... C (Combi)												□ 36...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
3000-08×100 LC	□	3000-08×100 RC	□	8	8	100	3.5					30... C
3000-10×100 LC	□	3000-10×100 RC	□	10	10	100	3.5					30... C
3000-12×100 LC	□	3000-12×100 RC	□	12	12	100	3.5					30... C
3000-16×125 LC	□	3000-16×125 RC	□	16	16	125	3.5					30... C
3000-20×125 LC	□	3000-20×125 RC	□	20	20	125	3.5					30... C

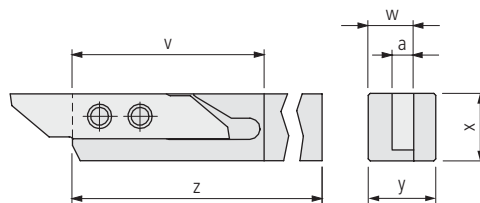
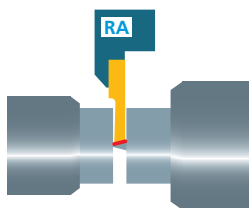
3000... C (Combi) INCH												
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
3000-3/8"×100 LC	□	3000-3/8"×100 RC	□	9.525	9.525	100	3.5					30...
3000-1/2"×100 LC	□	3000-1/2"×100 RC	□	12.7	12.7	100	3.5					30...
3000-5/8"×125 LC	□	3000-5/8"×125 RC	□	15.85	15.85	125	3.5					30...



Spannen der Schneiden auf Halter 3000... C | Montage des plaquettes sur porte-outil 3000... C | Clamping of the insert on holder 3000... C □ 89

Mit abgesetztem Schaft und versetztem Plattensitz | Avec queue et siege de la plaquette déporté | With off-set shank and insert seat

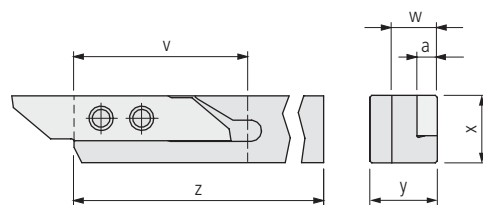
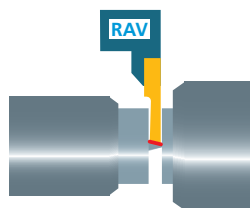
82



Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions							Schneiden Plaquettes Inserts
				x	y	z	v	w	a		
3000...A											□ 36...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution									
3000-10×100 LA	■	3000-10×100 RA	■	10	10	100	37	8	3.5		30...
3000-10×150 LA	□	3000-10×150 RA	□	10	10	150	37	8	3.5		30...
3000-12×100 LA	■	3000-12×100 RA	■	12	12	100	37	8	3.5		30...
3000-12×150 LA	□	3000-12×150 RA	□	12	12	150	37	8	3.5		30...
3000-16×125 LA	■	3000-16×125 RA	■	16	16	125	37	8	3.5		30...
3000-16×150 LA	□	3000-16×150 RA	□	16	16	150	37	8	3.5		30...

Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions							Schneiden Plaquettes Inserts
				x	y	z	v	w	a		
3000...A INCH											□ 36...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution									
3000-3/8"×100 LA	■	3000-3/8"×100 RA	■	9.525	9.525	100	37	8	3.5		30...
3000-1/2"×100 LA	■	3000-1/2"×100 RA	■	12.7	12.7	100	37	8	3.5		30...
3000-5/8"×125 LA	□	3000-5/8"×125 RA	□	15.85	15.85	125	37	8	3.5		30...

Mit abgesetztem Schaft | Avec queue déporté | With off-set shank

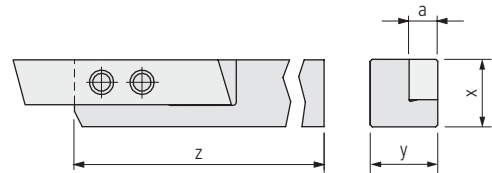
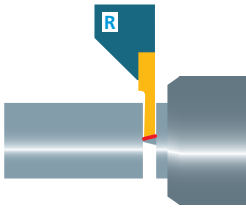


Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions							Schneiden Plaquettes Inserts
				x	y	z	v	w	a		
3000...AV											□ 36...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution									
3000-10×100 LAV	■	3000-10×100 RAV	■	10	10	100	28	8	3.5		30...
3000-10×150 LAV	□	3000-10×150 RAV	□	10	10	150	28	8	3.5		30...
3000-12×100 LAV	■	3000-12×100 RAV	■	12	12	100	28	8	3.5		30...
3000-12×150 LAV	□	3000-12×150 RAV	□	12	12	150	28	8	3.5		30...
3000-16×125 LAV	■	3000-16×125 RAV	■	16	16	125	28	8	3.5		30...
3000-16×150 LAV	□	3000-16×150 RAV	□	16	16	150	28	8	3.5		30...

Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions							Schneiden Plaquettes Inserts
				x	y	z	v	w	a		
3000...AV INCH											□ 36...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution									
3000-3/8"×100 LAV	■	3000-3/8"×100 RAV	■	9.525	9.525	100	28	8	3.5		30...
3000-1/2"×100 LAV	■	3000-1/2"×100 RAV	■	12.7	12.7	100	28	8	3.5		30...
3000-5/8"×125 LAV	□	3000-5/8"×125 RAV	□	15.85	15.85	125	28	8	3.5		30...

Standard | Standard | Standard

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Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				x	y	z	a					
3600...												□ 55/65
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
3600-10×100 L	■	3600-10×100 R	■	10	10	100	6					36...
3600-12×100 L	■	3600-12×100 R	■	12	12	100	6					36...
3600-16×125 L	■	3600-16×125 R	■	16	16	125	6					36...
3600-20×125 L	■	3600-20×125 R	■	20	20	125	6					36...
3600-25×150 L	■	3600-25×150 R	■	25	25	150	6					36...

Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				x	y	z	a					
3600... INCH												□ 55/65
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
3600-3/8"×100 L	□	3600-3/8"×100 R	□	9.525	9.525	100	6					36...
3600-1/2"×100 L	□	3600-1/2"×100 R	□	12.7	12.7	100	6					36...
3600-5/8"×125 L	□	3600-5/8"×125 R	□	15.85	15.85	125	6					36...

Serie 500/1600/1700

Abbildung Illustration Illustration	Bezeichnung Désignation Designation	Dimensionen Dimensions Dimensions	Beschreibung Description Description	Schneide Plaquette Insert
	MSP 25060 T08	M2.5 × 6 T08	Torxschraube Vis torx Torx scREW	50...2... 16...3... 17...3...
	MSP 25070 T08	M2.5 × 7 T08	Torxschraube Vis torx Torx scREW	16...4...
	MSP 25090 T08	M2.5 × 9 T08	Torxschraube Vis torx Torx scREW	16...6... 16...8...
	MSP TX08	T08	Torxschlüssel Tournevis torx Torx screwdriver	
	MSP TX08 D	T08 (1.2 Nm)	Drehmoment-Torxschlüssel Tournevis à serrage contrôlé Torquedriver	

Serie 3000/3600

Abbildung Illustration Illustration	Bezeichnung Désignation Designation	Dimensionen Dimensions Dimensions	Beschreibung Description Description	Halter Porte-outil Holder
	MSP 25090 T08	M2.5 × 9 T08	Torxschraube Vis torx Torx scREW	3000...C (Combi)
	MSP 30073 T08	M3 × 7.3 T08	Torxschraube Vis torx Torx scREW	3000-08... 3000...A
	MSP 30090 T08	M3 × 9 T08	Torxschraube Vis torx Torx scREW	3000...
	MSP 30110 TP09	M3 × 11 TP09	Torxschraube Vis torx Torx scREW (Torx Plus)	3600...
	MSP TX08	T08	Torxschlüssel Tournevis torx Torx screwdriver	
	MSP TXP09	TP09	Torxschlüssel Tournevis torx Torx screwdriver (Torx Plus)	
	MSP TX08 D	T08 (1.2 Nm)	Drehmoment-Torxschlüssel Tournevis à serrage contrôlé Torquedriver	
	MSP 25040 GB1	M2.5 × 4	Gewinde-Büchse Douilles filetées Tapped bushing	3000...
	MSP 25040 GB2	M2.5 × 4	Gewinde-Büchse Douilles filetées Tapped bushing	3000...

Werkstoffe | Matières | Materials

	Stahl unlegiert Acier non allié Steel unalloyed			Stahl niedriglegiert Acier faibl. allié Steel low alloyed			Stahl hochlegiert Acier fortem. allié Steel high alloyed			Titan Titane Titanium		
Härte (HB) Dureté (HB) Hardness value (HB)	125–300			180–250			200–350			–		
Kategorie Catégorie Category	I			II			III			IV		
Bearbeitung Usinage Machining method	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼

Vorschübe (f) | Avances (f) | Feeds (f)

	f (mm/U mm/tr mm/rev)			f (mm/U mm/tr mm/rev)			f (mm/U mm/tr mm/rev)			f (mm/U mm/tr mm/rev)		
	0.1–0.25	0.02–0.15	0.005–0.08	0.1–0.25	0.02–0.15	0.005–0.08	0.1–0.25	0.02–0.15	0.005–0.08	0.1–0.25	0.02–0.08	0.005–0.06

Schnitttiefen (a_p) | Profondeurs de passes (a_p) | Depths of cut (a_p)

	a _p (mm)			a _p (mm)			a _p (mm)			a _p (mm)		
	<5	<3	<2	<5	<3	<2	<4	<2.5	<1.5	<4	<2.5	<1.5

Schnittgeschwindigkeiten (v_c) | Vitesses de coupe (v_c) | Cutting speeds (v_c)

	v _c (m/min)			v _c (m/min)			v _c (m/min)			v _c (m/min)		
Schneidstoff Hartmetall Matériaux de coupe carbure Cutting material carbide												
UHM 30	30–70	50–80	50–100	30–60	40–80	40–90	–	30–70	30–80	–	25–60	30–70
UHM 30 SX	50–120	50–180	50–200	50–100	50–140	50–180	40–90	50–120	50–160	–	–	–
UHM 30 HX	50–140	50–180	50–220	50–130	50–160	50–200	40–120	50–140	50–180	30–90	40–100	40–120

Werkstoffe | Matières | Materials

	Rostfreier Stahl Acier inoxydable Stainless steel			Rostfreier Stahl Acier inoxydable Stainless steel			Aluminium Aluminium Aluminium			Messing Laiton Brass		
Härte (HB) Dureté (HB) Hardness value (HB)	180–220			220–330			60–130			–		
Kategorie Catégorie Category	V			VI			VII			VIII		
Bearbeitung Usinage Machining method	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼

Vorschübe (f) | Avances (f) | Feeds (f)

	f (mm/U mm/tr mm/rev)			f (mm/U mm/tr mm/rev)			f (mm/U mm/tr mm/rev)			f (mm/U mm/tr mm/rev)		
	0.1–0.2	0.01–0.12	0.005–0.08	0.1–0.2	0.01–0.12	0.005–0.08	0.1–0.3	0.02–0.25	0.005–0.20	0.1–0.3	0.02–0.15	0.005–0.10

Schnitttiefen (a_p) | Profondeurs de passes (a_p) | Depths of cut (a_p)

	a _p (mm)			a _p (mm)			a _p (mm)			a _p (mm)		
	<4	<2.5	<1.5	<4	<2.5	<1.5	<5	<3	<2	<5	<3	<2

Schnittgeschwindigkeiten (v_c) | Vitesses de coupe (v_c) | Cutting speeds (v_c)

	v _c (m/min)			v _c (m/min)			v _c (m/min)			v _c (m/min)		
Schneidstoff Hartmetall Matériaux de coupe carbure Cutting material carbide												
UHM 30	–	30–70	30–80	–	20–40	20–40	50–1000	60–1200	80–1500	40–100	50–140	50–160
UHM 30 SX	30–90	40–120	40–160	–	30–60	30–80	60–1200	80–2000	100–3000	50–120	50–180	50–200
UHM 30 HX	40–100	40–140	40–180	30–60	40–70	40–90	70–1500	80–2000	100–3000	50–150	50–200	50–250

ANWENDUNGSBEREICHE DER SCHNEIDSTOFFSORTEN DOMAINES D'APPLICATIONS DES MATÉRIAUX DE COUPE APPLICATION RANGE OF CUTTING GRADES

MULTIDEC®-CUT

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UTILIS®
Tooling for High Technology

Sorte Nuance Grade	Normbezeichnung Norme Norm	Zähigkeit des Schneidstoffs Tenacité du matériau de coupe Toughness of cutting grades													Werkstoffe (Kategorie) Matières (Catégorie) Materials (Category)							
		Härte (HB) Dureté (HB) Hardness value (HB) 													Stahl unlegiert Acier non allié Steel non-alloyed (I)	Stahl niedrig legiert Acier faibl. allié Steel low alloyed (II)	Stahl hochlegiert Acier fortem. allié Steel high alloyed (III)	Titan Titane Titanium (IV)	Rostfreier Stahl Acier inoxydable Stainless steel (V)	Rostfreier Stahl Acier inoxydable Stainless steel (VI)	Aluminium Aluminium (VII)	Messing Laiton Brass (VIII)
		01	05	10	15	20	25	30	35	40	45	50	125 – 300	180 – 250	200 – 350	180 – 220	220 – 330	60 – 130				
Hartmetall Carbure Carbide																						
UHM 30	K 30/M 20												●	○	○	○	○	●	●			
UHM 30 SX	K 30/M 20												●	●	●	●	○	○	○			
UHM 30 HX	K 30/M 20												●	●	●	●	○	○	○			

ANWENDUNGSEMPFEHLUNG FÜR ANZAHL DURCHGÄNGE BEIM GEWINDESCHNEIDEN RECOMMANDATION SUR LE NOMBRE DE PASSES POUR LE FILETAGE APPLICATION RECOMMENDATION FOR NUMBER OF PASSES AT THREADING

Steigung Pas Pitch	0.06–0.09	0.1–0.35	0.40	0.45	0.50	0.75	0.80	1.00	1.25	1.50	1.75	2.00
Stahl Acier Steel	2–4	3–5	3–6	3–7	5–10	7–11	7–12	8–15	10–18	11–22	12–24	15–28
Rostfreier Stahl Acier inoxydable Stainless steel	3–6	4–7	5–8	6–9	8–10	9–12	10–15	11–17	13–20	18–22	20–26	25–30
Titan Titane Titanium	3–6	4–7	5–8	6–9	8–10	9–12	10–15	11–17	13–20	18–22	20–26	25–30
NE-Metall Métaux non ferreux Non-ferrous metal	2–4	3–5	3–6	3–7	3–8	4–9	5–10	6–11	7–14	8–16	8–16	17–22

Schnittgeschwindigkeit (v_c)
Vitesse de coupe (v_c)
Cutting speed (v_c)

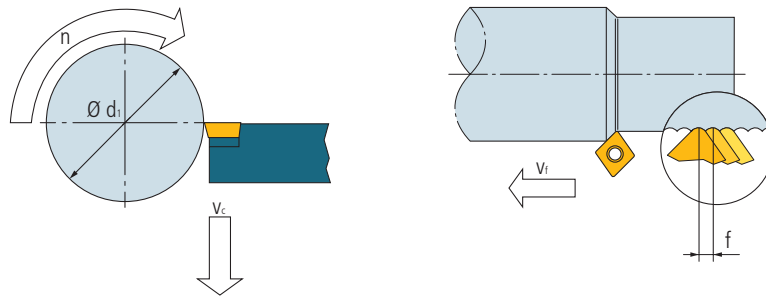
$$v_c = \frac{d_1 \cdot \pi \cdot n}{1000} \text{ [m/min]}$$

Umdrehungen pro Minute (n)
Nombre de tours par minute (n)
Revolutions per minute (n)

$$n = \frac{v_c \cdot 1000}{d_1 \cdot \pi} \text{ [min}^{-1}\text{]}$$

Vorschubgeschwindigkeit (v_f)
Avance (v_f)
Feedrate (v_f)

$$v_f = f \cdot n \text{ [mm/min]}$$



SPANNEN DER SCHNEIDEN AUF HALTER 3000...C (COMBI) MONTAGE DES PLAQUETTES SUR PORTE-OUTIL 3000...C (COMBI) CLAMPING OF THE INSERT ON HOLDER 3000...C (COMBI)

Bei Multidec®-Cut 3000 werden die Schrauben von der Plattenseite her, bei der Serie 3000 C mit Combi-Spannung mittels Büchsen von der Halterseite her befestigt.

Par défaut, les vis de serrage de la plaquette, sont introduites par le même côté que la plaquette. En utilisant la gamme Cut 3000 C avec le serrage combi, les vis sont montées par le côté opposé à la plaquette, grâce à l'insertion de douilles filetées.

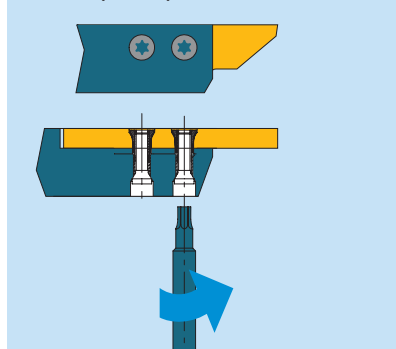
The regular tool holder Cut 3000 uses the insert fixing screws from the side of the insert. The tool holder Cut 3000 «combi» allows in addition the insert fixing screws to be mounted from the opposite side using tapped bushings.

Ein- und Auspressen der Gewindebüchse
Um Beschädigungen zu vermeiden, sollte beim Ein- und Auspressen der Gewindebüchsen keine Gewalt angewendet werden.

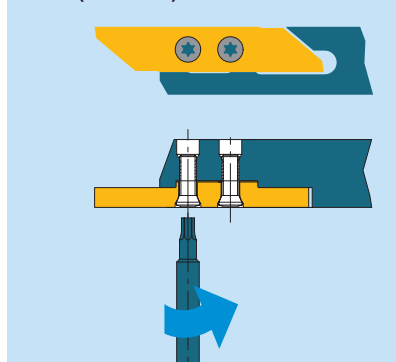
Insertion et extraction des douilles
Pour qu'elles soient ré-utilisables, il est nécessaire d'introduire et d'extraire les douilles avec doigté.

Handling of the tapped bushing
To avoid damage don't use excessive force while inserting and removing the tapped bushing.

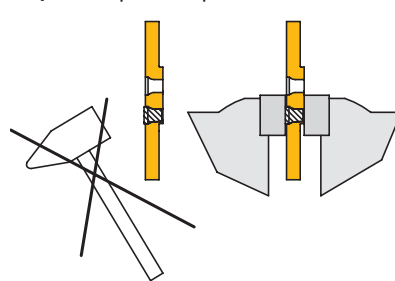
3000... (Combi)



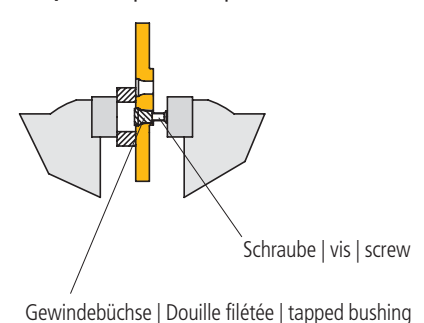
3000 (Standard)



Einpressen | Insérer | Press in



Auspressen | Extraire | Press out



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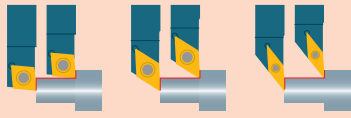
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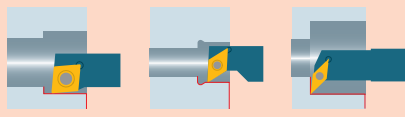
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Schnittdaten Données de coupe Cutting specification		Soll-Größen Nur von 0 bis maximal 200	Soll-Größen Nur 100 bis maximal 200	Soll-Größen Nur 100 bis maximal 200	Soll-Größen Nur 100 bis maximal 200
	Körn (µm) Grain (µm) Median (µm)	125 – 200	100 – 200	200 – 200	–
	Kategorie Catégorie Category	1	2	3	4
	Material Matériau Material	✓	✓	✓	✓
	Größe Tailleur Cutting method	✓	✓	✓	✓

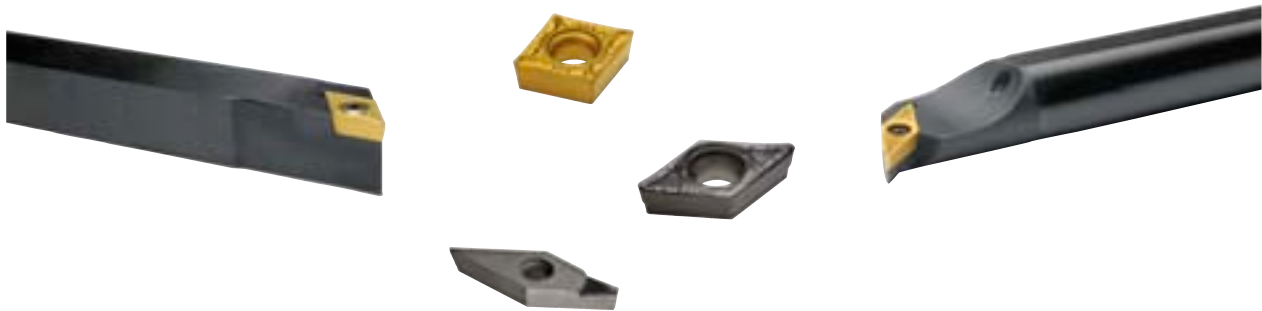
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Multidec®-ISO bietet ein breites Programm ISO-genormter Wendeschneidplatten für das Automaten- und Präzisionsdrehen. Alle Wendeschneidplatten verfügen über mehrere Schneiden und sind leicht auswechselbar. Zugleich bietet Multidec®-ISO dem Automatendreher eine stabile scharfe Schneidenecke mit Radien von 0.00 bis 0.8 mm. Für die Bearbeitung von Werkstoffen, die schwierig zu zerspanen sind, wurden raffinierte Lösungen aus beschichteten oder unbeschichteten Hartmetallsorten (K10–P40), Cermet sowie PKD-Bestückungen entwickelt. Ausserdem gibt es eine grosse Auswahl an gesinterten und geschliffenen Spanleitstufen für alle Schlicht-, Fein- und Feinstbearbeitungen. Ein breites Programm von hochvergüteten und geschliffenen Haltern für konventionelle und speziell für Langdrehautomaten mit Schaftquerschnitten von 8 bis 25 mm rundet Multidec®-ISO ab.

Multidec®-ISO, un programme standard destiné à la poupée mobile, avec une palette de choix de géométries de coupe, spécifique à l'usinage des matériaux difficiles et aux faibles avances. Multidec®-ISO propose à l'utilisateur des arêtes de coupe vives avec de petits rayons de 0.00 à 0.8 mm. Pour les matières difficiles à usiner, nous avons développés des géométries fortement positives, avec des nuances carbure (K10–P40), revêtues ou non, en Cermet et aussi avec inserts PCD. De plus il existe un grand choix de brise copeaux polis et affûtés pour des travaux de finition et super finition, ou alors uniquement frittés pour des travaux d'ébauche. Une vaste gamme de porte plaquette spécifique à la poupée mobile ou poupée fixe en carré de 8 x 8 à 25 x 25 mm est également disponible en standard dans le programme.

Multidec®-ISO provides a very wide range of ISO standardized inserts for automatic-lathe machining and precision turning. All inserts consist of two edges and are easily indexed or changed. At the same time Multidec®-ISO provides a very stable and sharp cutting edge with a maximum radius between 0.00 and 0.8 mm. Innovative solutions involving coated and uncoated inserts made of carbide (K10–P40), Cermet and PCD-tips have been designed for cutting of very difficult materials. For all mechanical cutting conditions a large choice of sintered and ground inserts with a large variety of chip grooves are available. Even for the holders a wide range of tempered and ground possibilities with holder sizes between 8 mm and 25 mm are available. For CNC Swiss-type automatic lathes special holders have been designed and complete the wide range of choices.



Vorteile

- Breites ISO-Programm an genormten Wendeschneidplatten
- Alle Schneiden leicht auswechselbar
- Wiederholgenauigkeit siehe Toleranzklasse
- Scharfe Schneiden mit 7° und 11° Freiwinkel
- Kleine Eckenradien (0.00–0.80 mm)
- Je nach Bearbeitung gut abgestimmte
 - Hartmetallsorten (K10–P40)
 - beschichtet und unbeschichtet
 - sowie Cermet und PKD
- Spezielle Halter für Langdrehautomaten erhältlich (Querschnitte 8 x 8 – 25 x 25 mm)

Avantages

- Grande gamme des plaquettes selon norme ISO
- Toutes les plaquettes sont facilement interchangeables
- Répétitivité voir norme ISO
- Arêtes de coupe vives avec 7° et 11° angle de dépouille
- Petits rayons de pointe (0.00–0.80 mm)
- Grand choix de nuances
 - nuances en carbure (K10–P40)
 - revêtues et non revêtues
 - Cermet et PCD
- Porte plaquette spécifique à la poupée mobile (carré de 8 x 8 – 25 x 25 mm)

Advantages

- Large range of inserts out of standard ISO range
- Each insert easy to replace
- Repeat accuracy see ISO norm
- Sharp edges with 7° or 11° clearance angle
- Small corner radius (0.00–0.80 mm)
- Big choice of grades
 - carbide (K10–P40)
 - with or without coating
 - Cermet and Diamond
- Especially designed holders for CNC Swiss-type automatic lathes (holder sizes 8 x 8 – 25 x 25 mm)

Besonderheiten der Schneiden DNGU

- Negativer Halter mit Schraubenbefestigung
- 4 Schneiden je Wendeschneidplatte
- Scharfe Schneiden mit 7° Freiwinkel
- Kleine Eckenradien (0.08 und 0.15)
- Hartmetall aus Feinstkornsorte
- Auch auf Halter mit Kniehebelspannung verwendbar

Particularités de la plaquette DNGU

- Porte-outils négatifs avec montage par vis
- 4 arêtes de coupe par plaquette
- Arêtes de coupe vives avec 7° angle de dépouille
- Petits rayons de pointe (0.08 et 0.15)
- Nuance super micro grain
- Plaquette DNGU aussi utilisable sur les porte-outils avec bride de montage

Specific features of insert DNGU

- Negative holder fixed with screw
- 4 cutting edges per insert
- Small corner radius (0.08 and 0.15)
- Sharp edges with 7° clearance angle
- Fine grain grade
- Insert DNGU also usable on holders with toggle setting device

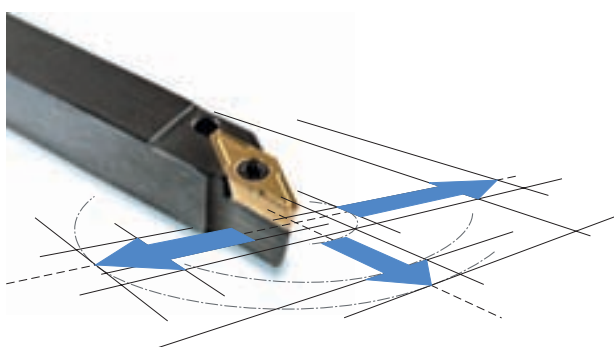


Multidec®-Top, eine Weiterentwicklung von «ISO», ist das optimale System zum Automaten- und Präzisionsdrehen. Alle Wendeschneidplatten verfügen über zwei Schneiden und sind leicht auswechselbar. Zugleich bietet Multidec®-Top dem Automatendreher eine stabile scharfe Schneidenecke mit einem maximalen Radius von 0.00, 0.08 bzw. 0.2 mm. Die Form der gesinterten Spanleitstufe erlaubt eine ideale Spanbeherrschung beim Längs-, Plan- und Rückwärtsdrehen. Ein breites Programm von hochvergüteten und geschliffenen Haltern für konventionelle und speziell für Langdrehautomaten mit Schaftquerschnitten von 8 bis 20 mm rundet Multidec®-Top ab.

Multidec®-Top, est la continuité de la gamme «ISO». Une plaquette optimale pour le décolletage et la petite mécanique. Toutes les plaquettes ont deux arêtes de coupe vives et sont facilement interchangeables. De plus ce programme propose à son utilisateur des rayons de 0.00, 0.08 et 0.2 mm. La forme du brise copeaux fritté permet de maîtriser parfaitement le copeau dans les différentes opérations de tournage. Une vaste gamme de porte-outils pour la poupée mobile ou alors pour les petits tours d'atelier, sont disponibles en grandeur 8 x 8 à 20 x 20 mm.

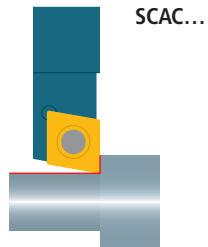
Multidec®-Top is a derivative of Multidec®-ISO and is ideal for automatic lathe-machining and precision-turning.

All inserts consist of two cutting edges and are easily indexed or changed. At the same time Multidec®-Top provides a very stable and sharp cutting edge with a radius of 0.00, 0.08 and 0.2 mm. The specific sintered chip breaker controls very well the chip flow on different machining operations. A large range of tempered, and ground precision holders are available with shank sizes between 8mm and 20mm. Specialized holders for use with CNC Swiss Type automatic lathes complete the wide range of choices.



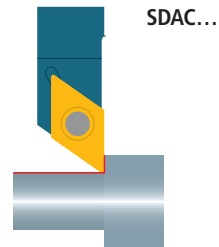
Vornedrehen
Tournage avant
Front turning

Halter | Porte-outils | Holders □ 123...



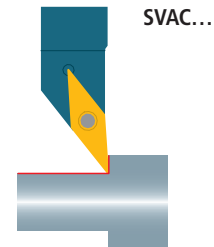
Vornedrehen
Tournage avant
Front turning

Halter | Porte-outils | Holders □ 125...



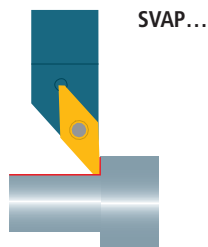
Vornedrehen
Tournage avant
Front turning

Halter | Porte-outils | Holders □ 130...



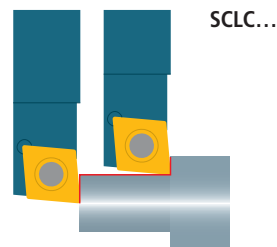
Vornedrehen
Tournage avant
Front turning

Halter | Porte-outils | Holders □ 131...



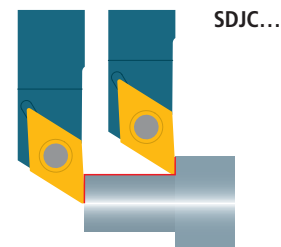
Längs- und Plandrehen
Tournage et dressage
Turning and facing

Halter | Porte-outils | Holders □ 124...



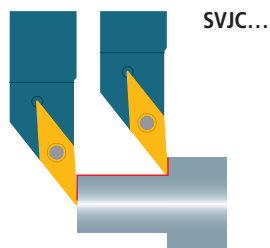
Längs- und Plandrehen
Tournage et dressage
Turning and facing

Halter | Porte-outils | Holders □ 126...



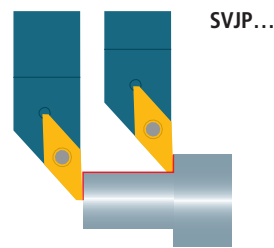
Längs- und Plandrehen
Tournage et dressage
Turning and facing

Halter | Porte-outils | Holders □ 132...



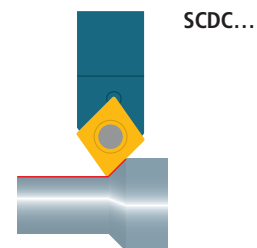
Längs- und Plandrehen
Tournage et dressage
Turning and facing

Halter | Porte-outils | Holders □ 134...



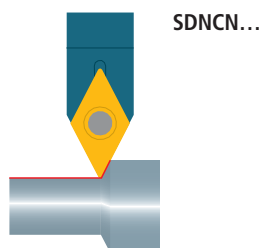
Längsdrehen
Tournage
Turning

Halter | Porte-outils | Holders □ 123...



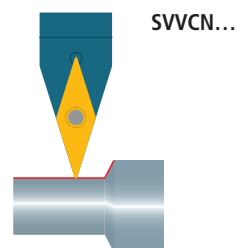
Längsdrehen
Tournage
Turning

Halter | Porte-outils | Holders □ 128...



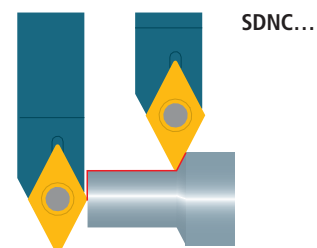
Längsdrehen
Tournage
Turning

Halter | Porte-outils | Holders □ 139...



Längs- und Plandrehen
Tournage et dressage
Turning and facing

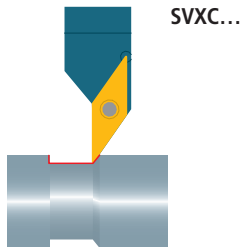
Halter | Porte-outils | Holders □ 128...



Hintendrehen
 Tournage arrière
 Back turning

Halter | Porte-outils | Holders

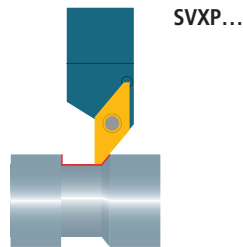
▢ 140...



Hintendrehen
 Tournage arrière
 Back turning

Halter | Porte-outils | Holders

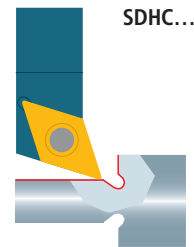
▢ 141...



Längsdrehen und Freistechen
 Tournage et plongée
 Turning and undercutting

Halter | Porte-outils | Holders

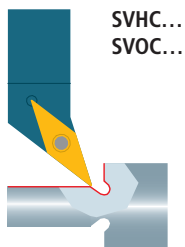
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Längsdrehen und Freistechen
 Tournage et plongée
 Turning and undercutting

Halter | Porte-outils | Holders

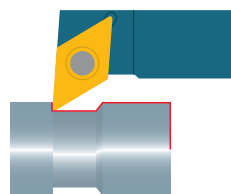
▢ 136...



Längs- und Plandrehen
 Tournage et dressage
 Turning and facing

Halter | Porte-outils | Holders

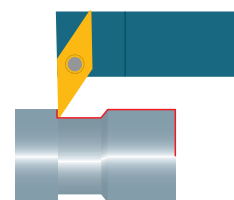
▢ 129...



Längs- und Plandrehen
 Tournage et dressage
 Turning and facing

Halter | Porte-outils | Holders

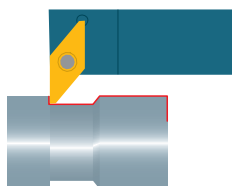
▢ 138...



Längs- und Plandrehen
 Tournage et dressage
 Turning and facing

Halter | Porte-outils | Holders

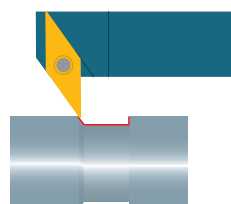
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Hintendrehen
 Tournage arrière
 Back turning

Halter | Porte-outils | Holders

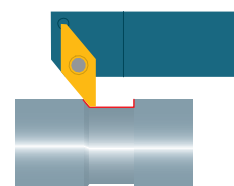
▢ 137...



Hintendrehen
 Tournage arrière
 Back turning

Halter | Porte-outils | Holders

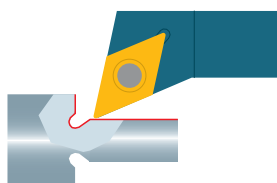
▢ 137...



Längsdrehen und Freistechen
 Tournage et plongée
 Turning and undercutting

Halter | Porte-outils | Holders

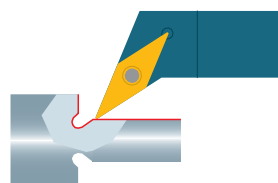
▢ 125...



Längsdrehen und Freistechen
 Tournage et plongée
 Turning and undercutting

Halter | Porte-outils | Holders

▢ 136...



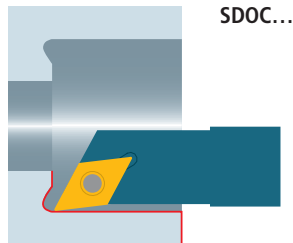
Längs- und Plandrehen
 Tournage et dressage
 Turning and facing

Halter | Porte-outils | Holders □ 142...



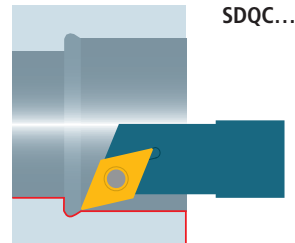
Längs- und Plandrehen
 Tournage et dressage
 Turning and facing

Halter | Porte-outils | Holders □ 144...



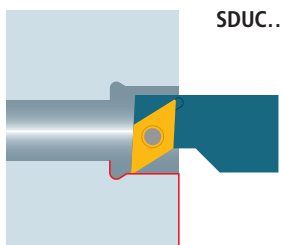
Längs- und Plandrehen
 Tournage et dressage
 Turning and facing

Halter | Porte-outils | Holders □ 145...



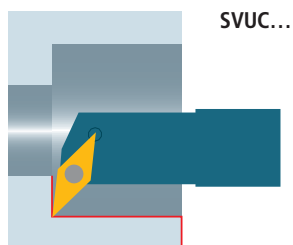
Längs- und Plandrehen
 Tournage et dressage
 Turning and facing

Halter | Porte-outils | Holders □ 146...



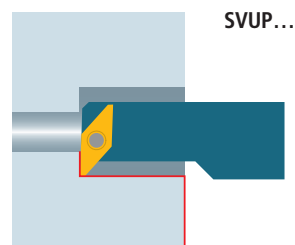
Längs- und Plandrehen
 Tournage et dressage
 Turning and facing

Halter | Porte-outils | Holders □ 151...



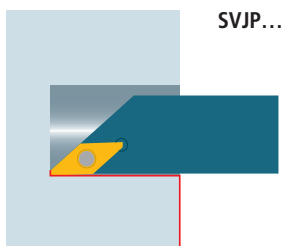
Längs- und Plandrehen
 Tournage et dressage
 Turning and facing

Halter | Porte-outils | Holders □ 152...



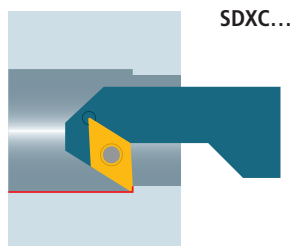
Längs- und Plandrehen
 Tournage et dressage
 Turning and facing

Halter | Porte-outils | Holders □ 148...



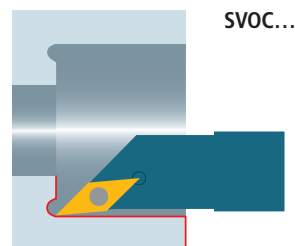
Hintendrehen
 Tournage arrière
 Back turning

Halter | Porte-outils | Holders □ 147...



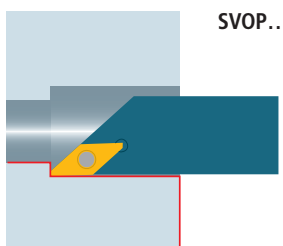
Längs- und Plandrehen
 Tournage et dressage
 Turning and facing

Halter | Porte-outils | Holders □ 149...



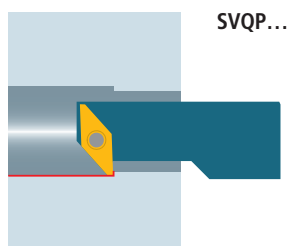
Längs- und Plandrehen
 Tournage et dressage
 Turning and facing

Halter | Porte-outils | Holders □ 150...



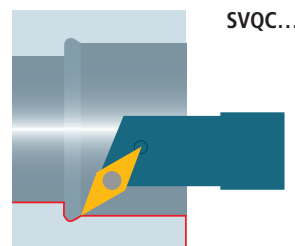
Hintendrehen
 Tournage arrière
 Back turning

Halter | Porte-outils | Holders □ 151...



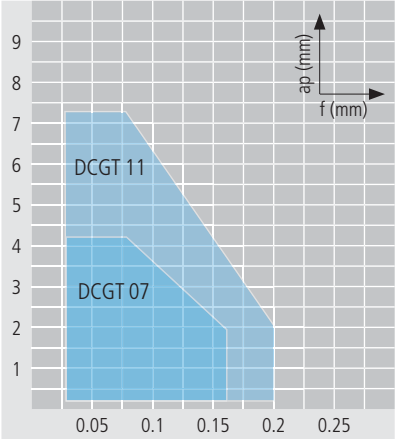
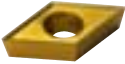
Längsdrehen und Freistechen
 Tournage et plongée
 Turning and undercutting

Halter | Porte-outils | Holders □ 148...



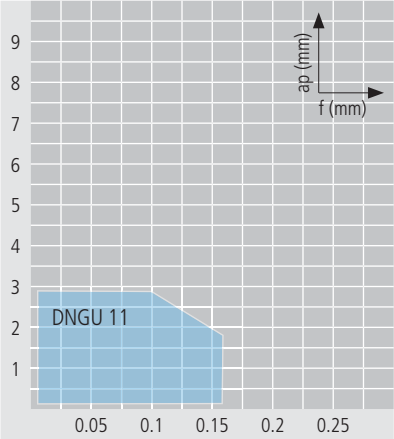
-A3

	I	II	III	IV	V	VI	VII	VIII	IX
▽	-	-	-	-	-	-	-	-	-
▽▽	○	○	○	○	○	○	●	-	●
▽▽▽	●	●	●	●	●	●	●	-	●



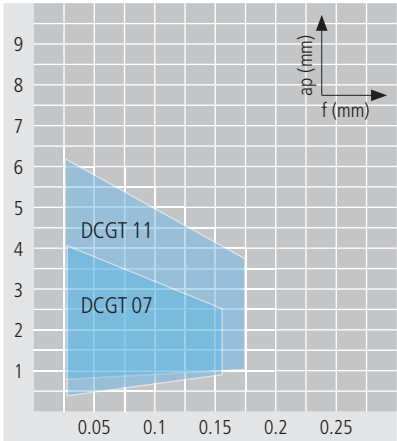
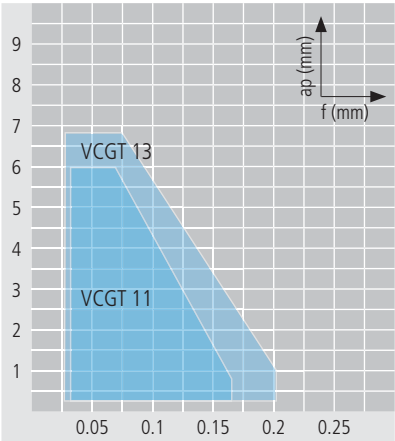
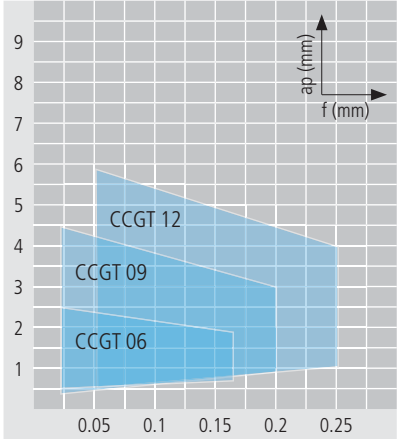
-A4

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▽▽▽	●	●	●	○	●	●	-	-	-



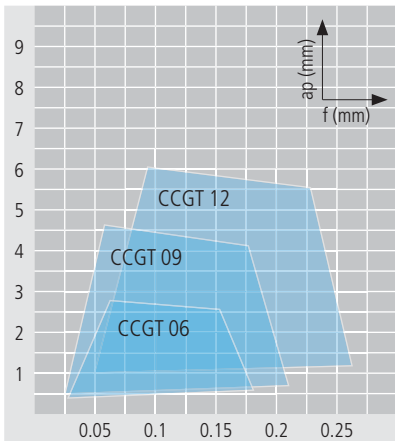
-PA3

	I	II	III	IV	V	VI	VII	VIII	IX
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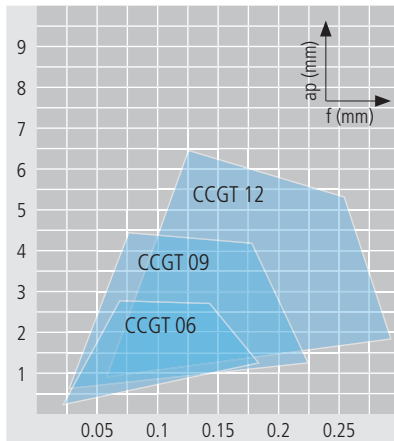
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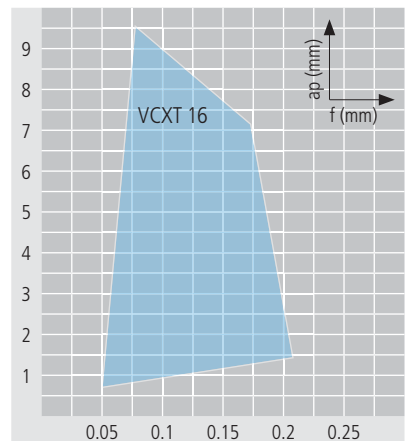
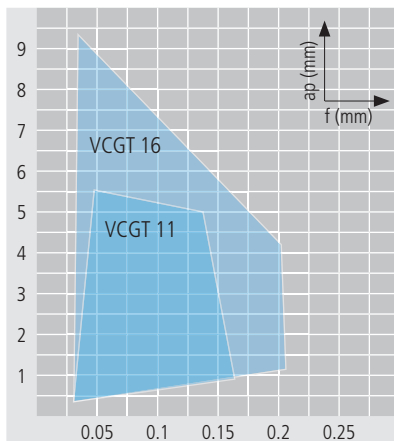
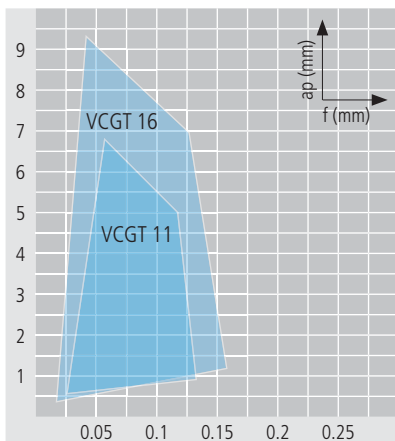
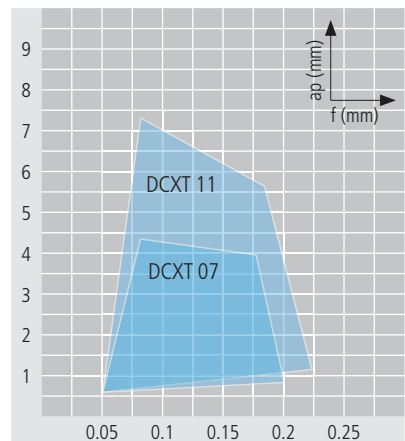
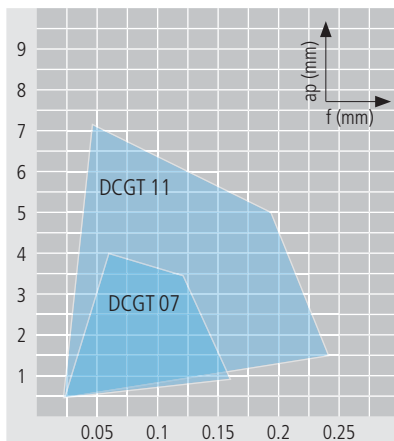
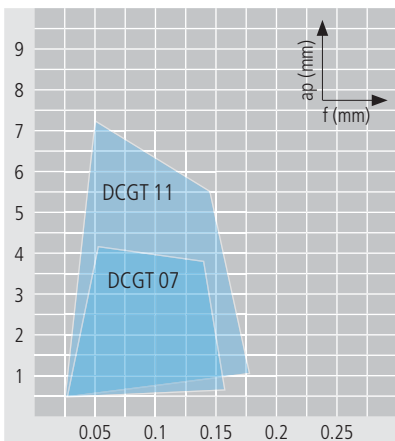
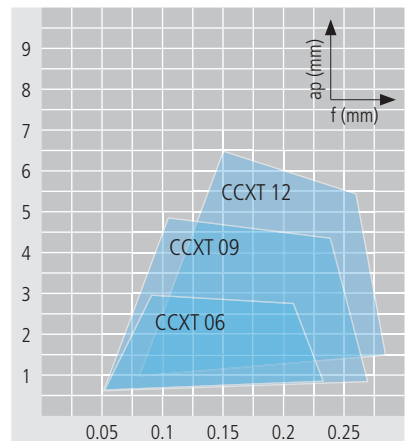
-PA7

	I	II	III	IV	V	VI	VII	VIII	IX
▽	—	—	—	—	—	—	—	—	—
▽▽	○	○	○	○	○	○	○	—	○
▽▽▽	●	●	●	○	○	○	○	—	○

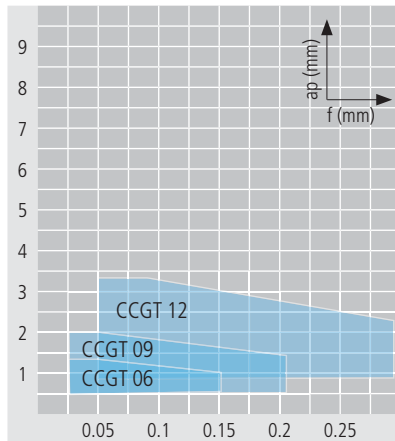
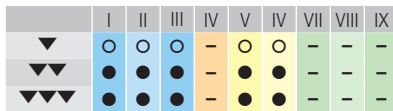


-PA9

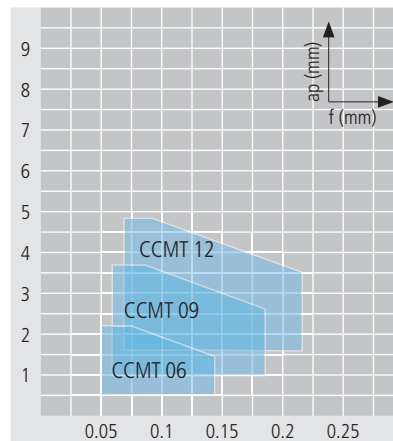
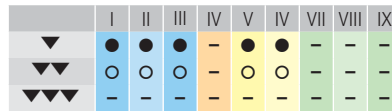
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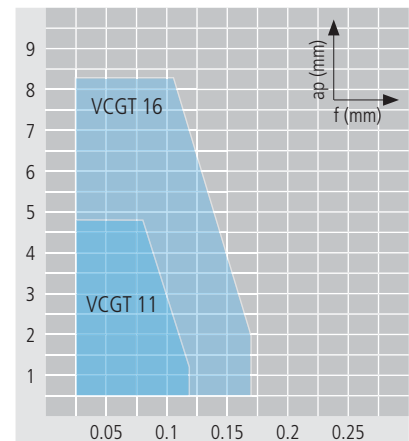
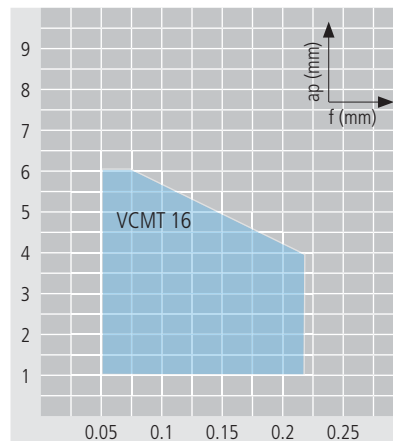
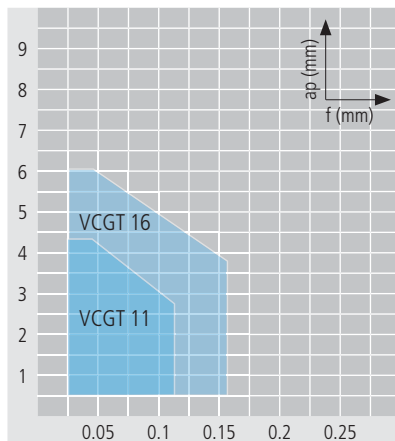
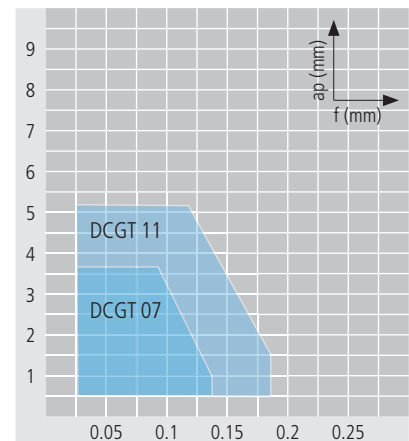
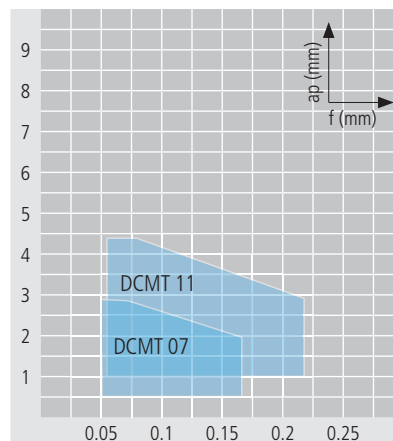
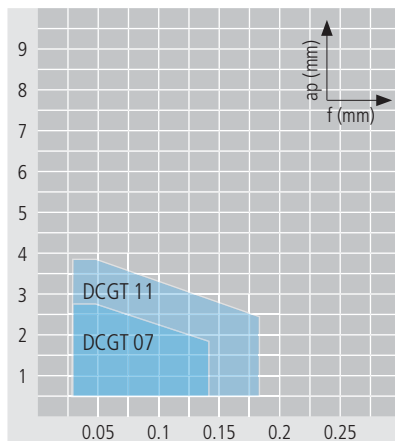
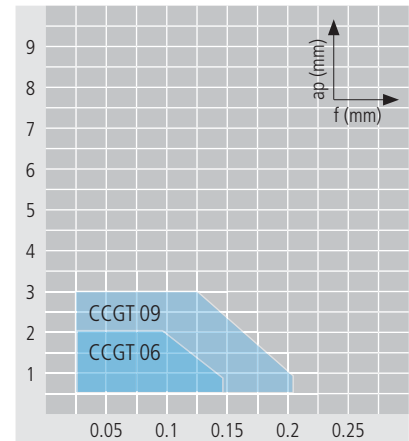
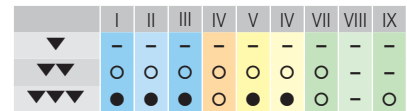
-PF



-PF

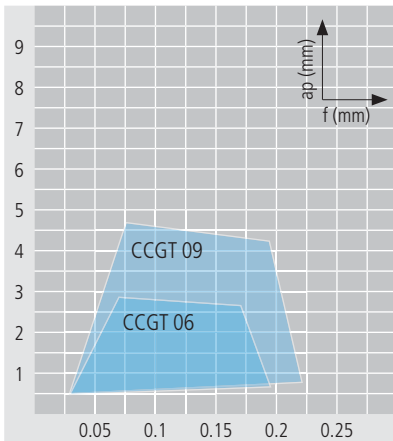


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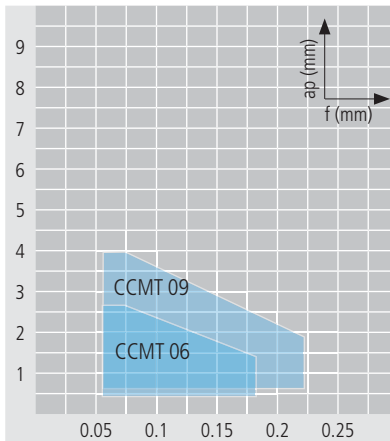
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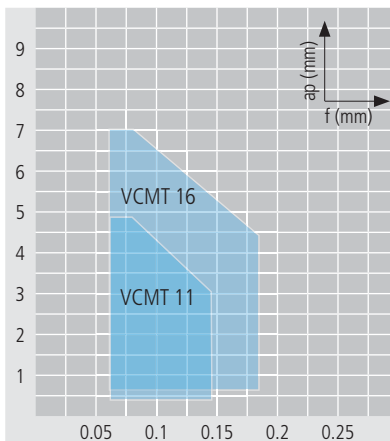
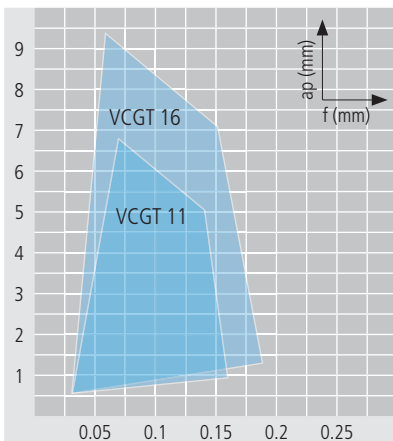
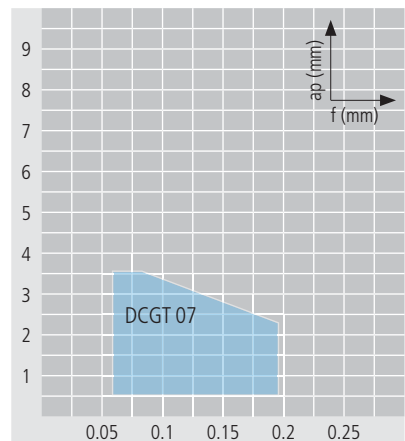
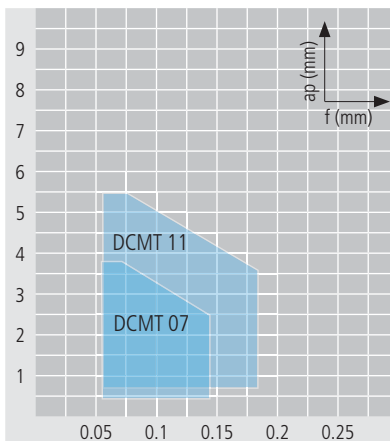
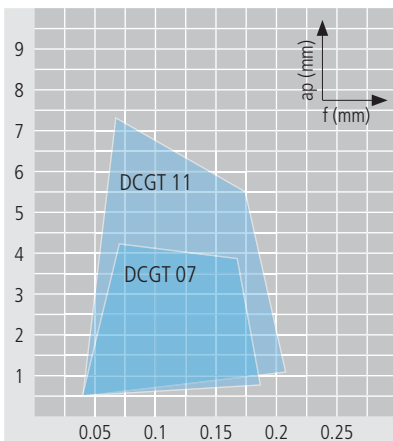
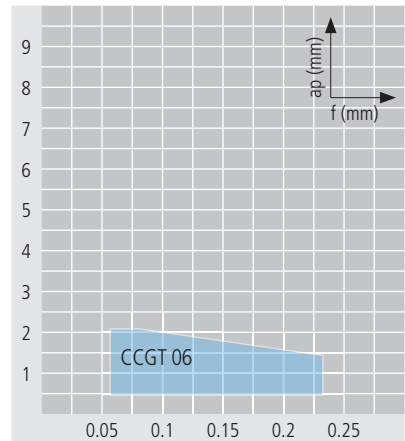
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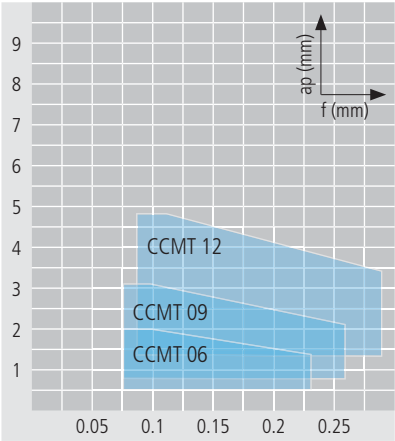
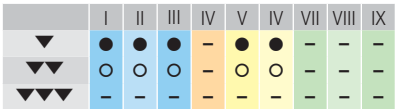


-PM

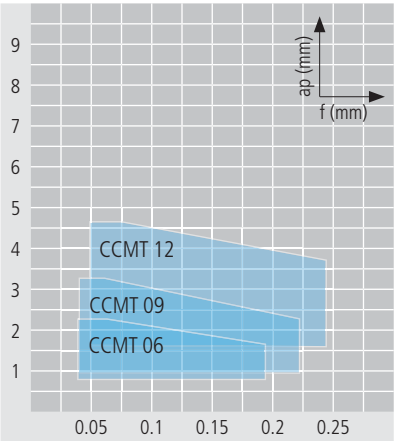
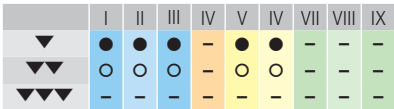
	I	II	III	IV	V	VI	VII	VIII	IX
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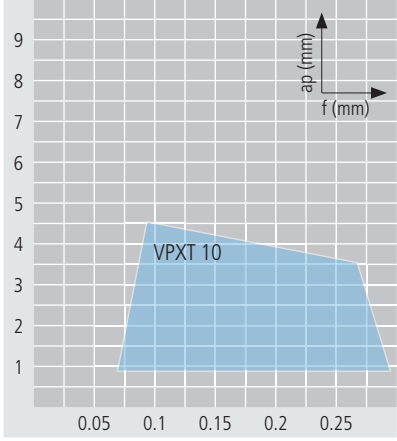
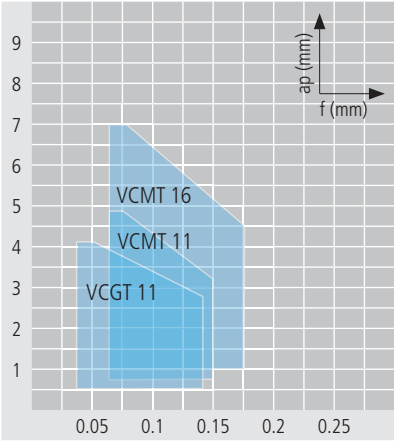
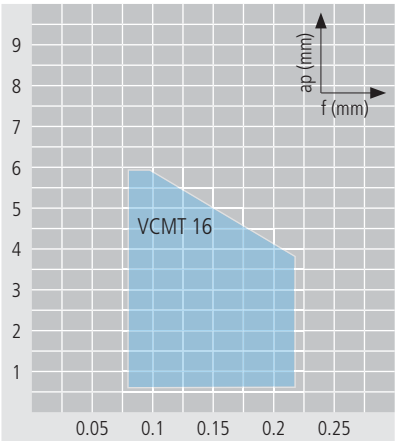
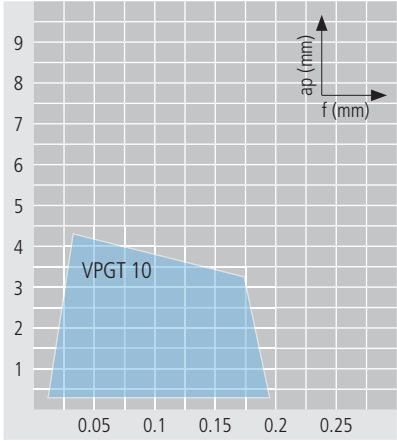
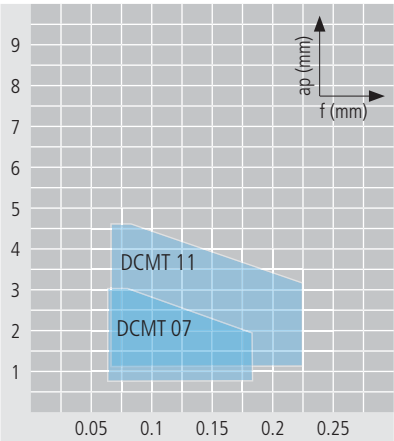
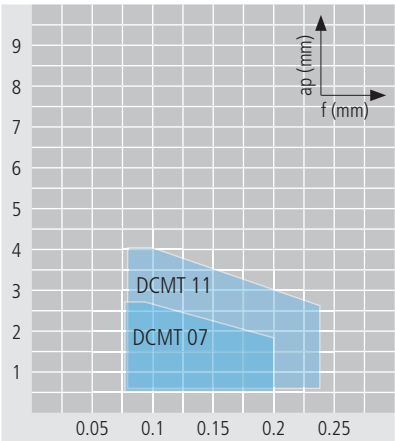
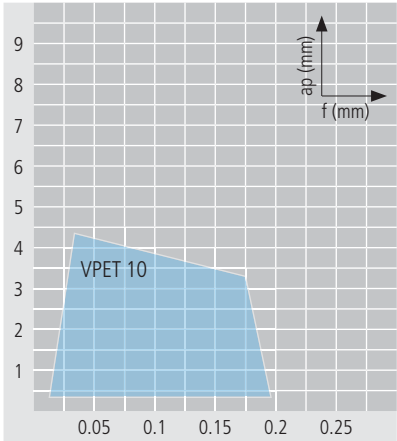
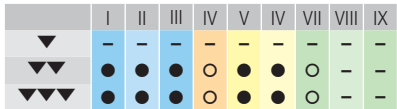
-PM



-PMF

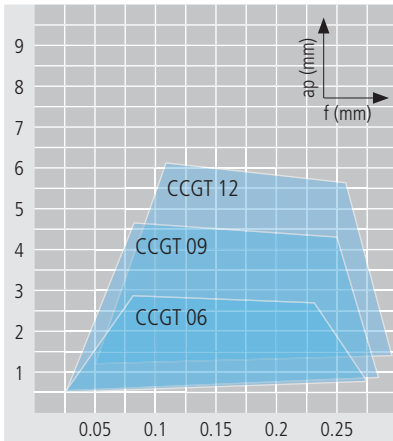


-TOP



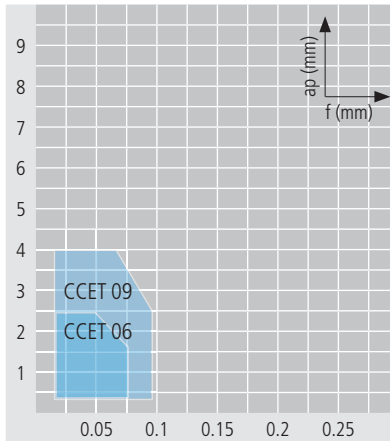
-TOP5

	I	II	III	IV	V	VI	VII	VIII	IX
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▽▽▽	○	○	○	○	○	○	○	○	○



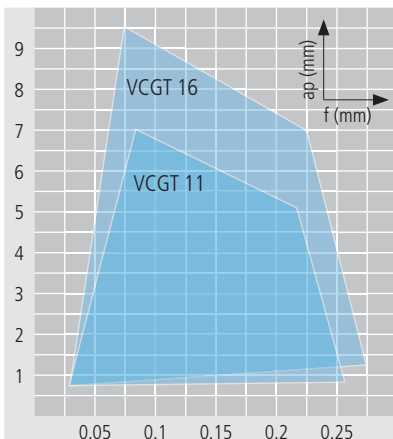
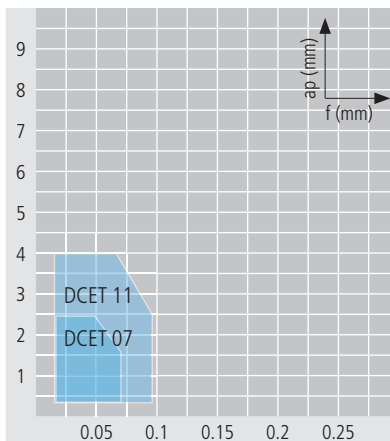
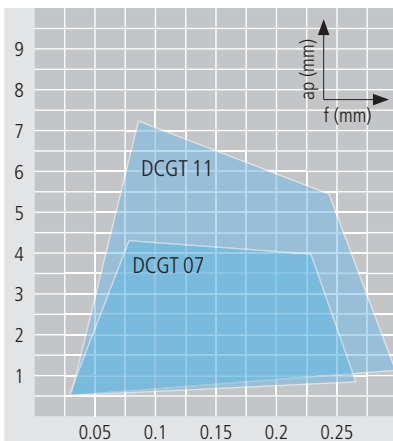
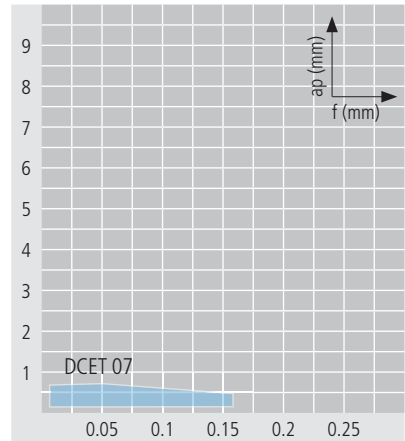
-U

	I	II	III	IV	V	VI	VII	VIII	IX
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▽▽	●	●	●	●	●	●	●	●	●
▽▽▽	○	○	○	○	○	○	○	○	○

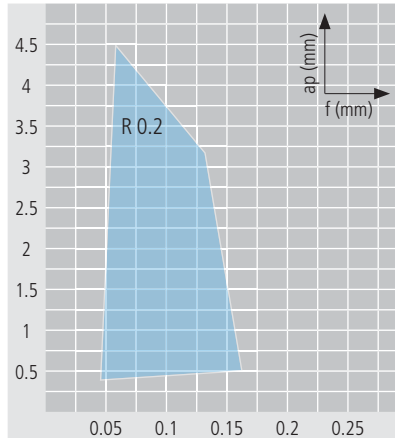
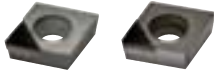


-US

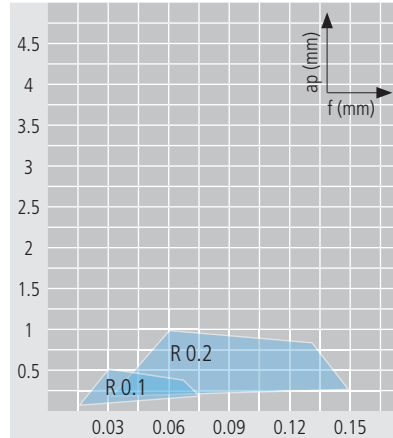
	I	II	III	IV	V	VI	VII	VIII	IX
▽	○	○	○	○	○	○	○	○	○
▽▽	●	●	●	●	●	●	●	●	●
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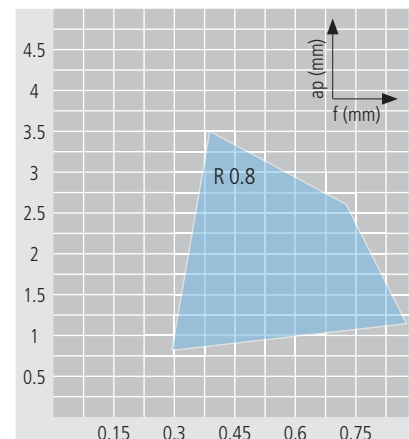
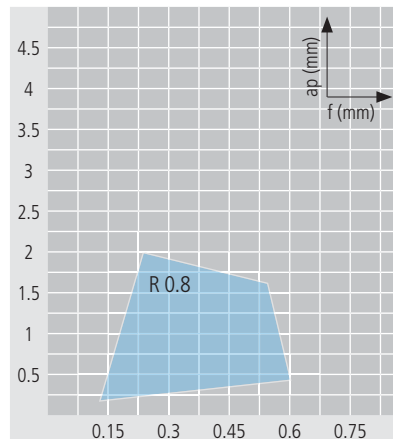
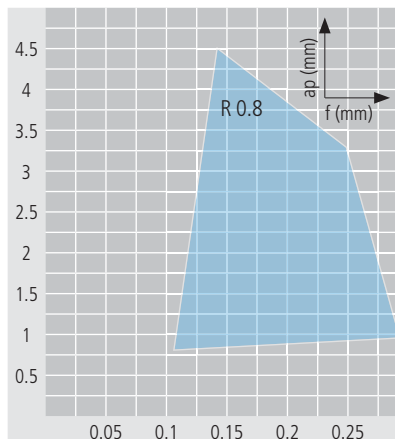
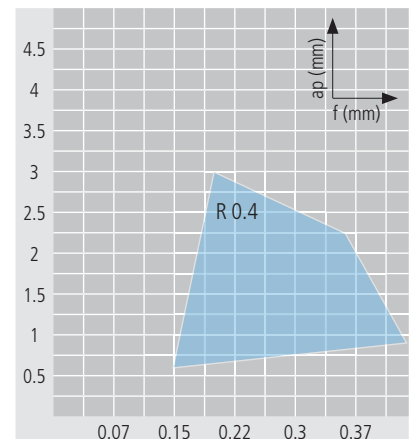
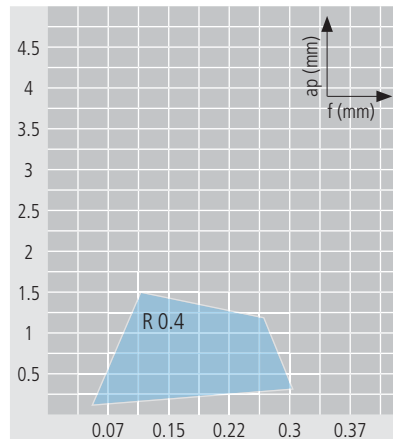
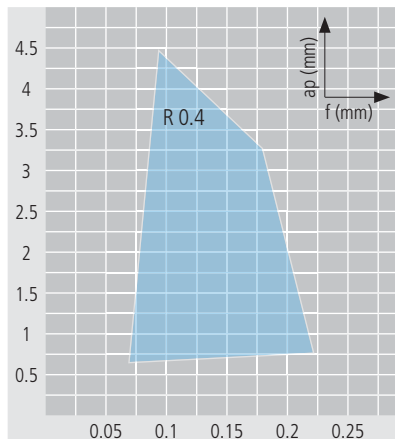
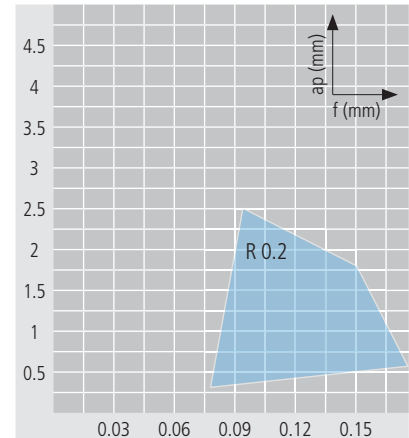
-FN (Diamond)



-TOP UWF (Diamond)



-TOP UWM (Diamond)

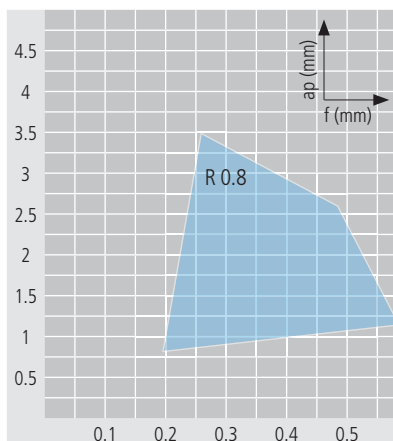
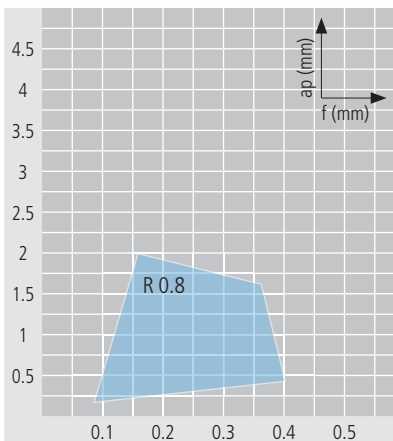
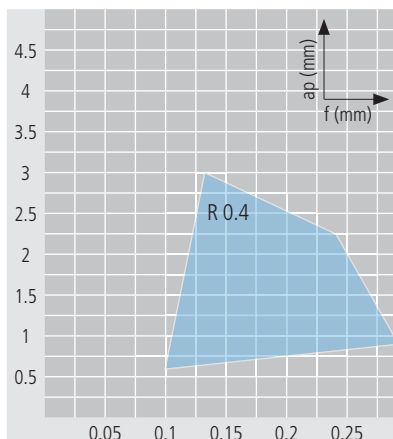
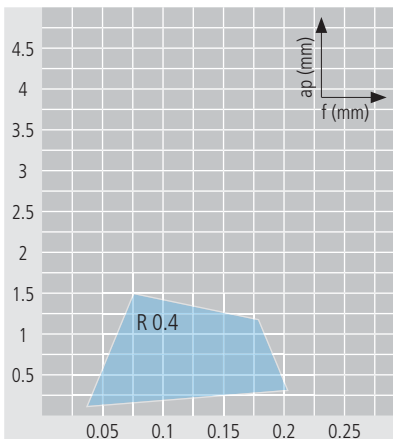
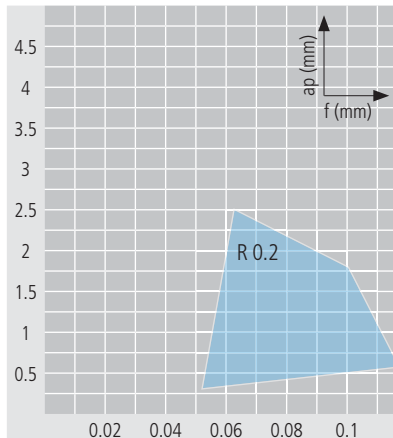
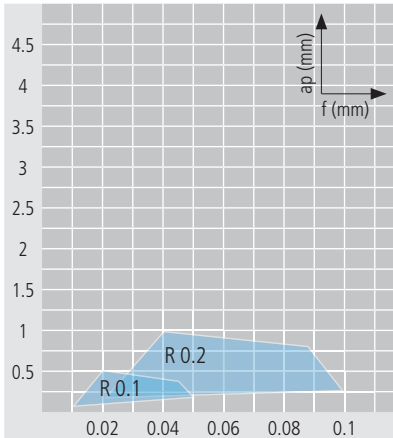


-UWF (Diamond)

	I	II	III	IV	V	VI	VII	VIII	IX
▽	—	—	—	—	—	—	—	—	—
▽▽	—	—	—	—	—	—	○	○	○
▽▽▽	—	—	—	—	—	—	●	●	●

-UWM (Diamond)

	I	II	III	IV	V	VI	VII	VIII	IX
▽	—	—	—	—	—	—	—	—	—
▽▽	—	—	—	—	—	—	○	○	○
▽▽▽	—	—	—	—	—	—	●	●	●



Wendepplatten | Plaquettes amovibles | Indexable inserts

Plattenform Forme de plaquette Form of insert		
Index	α	
V	35°	
D	55°	
C	80°	

Freiwinkel Angle de dépouille Clearance angle		
Index	α	
C	7°	
N	0°	
P	11°	

Toleranzen Tolérance Tolerance		
Index	$s \pm$	$d \pm$
E	0.025	0.025
G	0.13	0.025
M	0.13	0.05–0.15*
X	0.1	0.04

* Von der Plattengröße abhängig
Dépendant de la dimension de la plaquette
Dependent on dimension of insert

Merkmal Marque distinctive Distinctive mark	
Index	
W	
T	
U	
X/Z	Sonderausführung Exécution spéciale Special shape

DCGT 0702015 FN -A3 UHM 30 HX

Spanleitstufe Brise copeaux Chip breaker
97

Hartmetall Carbure Carbide
155

Beschichtung Revêtement Coating
14

Schneidenlänge Longueur de l'arête coupante Edge length			
Index	l	d	
06	6.4	6.35	
09	9.7	9.53	
12	12.9	12.7	
07	7.75	6.35	
11	11.6	9.53	
11	11.1	6.35	
16	16.6	9.59	
10	10	6.35	

Plattenstärke Épaisseur de plaquette Insert thickness		
Index	s	
02	2.38	
03	3.18	
T3	3.97	
04	4.76	

Eckenradius Rayon de pointe Corner radius	
Index	R
00/ZZ	0
003	0.03
006	0.06
008	0.08
01	0.1
015	0.15
02	0.2
035	0.35
04	0.4
075	0.75
08	0.8

Schneidkanten Arête de coupe Edge condition	
Index	
F	Scharf Arête de coupe vive Sharp
E	Gerundet Arête de coupe arrondie Rounded

Schneidrichtung Direction de coupe Cutting direction		
Index		
L	Links À gauche Left	L
N	Neutral Neutre Neutral	N
R	Rechts À droite Right	R

Halter Aussendrehen | Porte-outils tournage extérieure | Holder OD turning

Schafthöhe Hauteur de la queue Shaft height	Schaftbreite Largeur de la queue Shaft width	Werkzeuglänge Longueur du porte-outil Holder length	Schneidenlänge Longueur de l'arête coupante Edge length	Sonderausführung Exécution spécial Special shape
h ₁ /h ₂	b	Index l ₁	Index l d	Index
		D 60 E 70 F 80 H 100 K 125 M 150 X... Special	06 6.4 6.35 09 9.7 9.53 12 12.9 12.7 07 7.75 6.35 11 11.6 9.53 11 11.1 6.35 16 16.6 9.59 10 10 6.35	U Für Langdrehautomaten Pour décolleteuses For Swiss-Type automatic lathes

SDJCR 1212 H07 U

Klemmung Fixation Clamping	Plattenform Forme de plaque Form of insert	Freiwinkel Angle de dépouille Clearance angle	Schneidrichtung Direction de coupe Cutting direction
Index	Index α	Index α	Index
S Geschraubt Vissé Screwed	V 35° D 55° C 80°	C 7° N 0° P 11°	L Links À gauche Left N Neutral Neutre Neutral R Rechts À droite Right

Halterform Forme du porte-outil Holder form
Index α
A 90°
F 90°
D 45°
H 107.5°
J 93°
L 95°
N 63°
O 117.5°
Q 90°
U 93°
X 55°

Halter Innendrehen | Porte-outils tournage intérieure | Holder ID turning

Schaftausführung Exécution queue Shaft execution	
Index	
A	Stahlschaft mit Innenkühlung Queue en acier avec arrosage intérieur Steel shaft with internal cooling
E	Hartmetallschaft, Stahlkopf und Innenkühlung Queue en carbure, tête en acier et arrosage intérieur Carbide shaft with steel head and internal cooling

Schaftdurchmesser Diamètre queue Shaft diameter
d_1


Werkzeuglänge Longueur du porte-outil Holder length		
Index	l_1	
F	80	
H	100	
K	125	
M	150	
Q	180	
R	200	
S	250	
T	300	
X...	Special	

Schneidenlänge Longueur de l'arête coupante Edge length			
Index	l	d	
06	6.4	6.35	
09	9.7	9.53	
12	12.9	12.7	
07	7.75	6.35	
11	11.6	9.53	
11	11.1	6.35	
16	16.6	9.59	
10	10	6.35	

A12K SDUCR 07

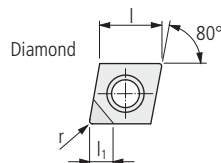
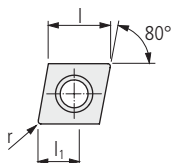
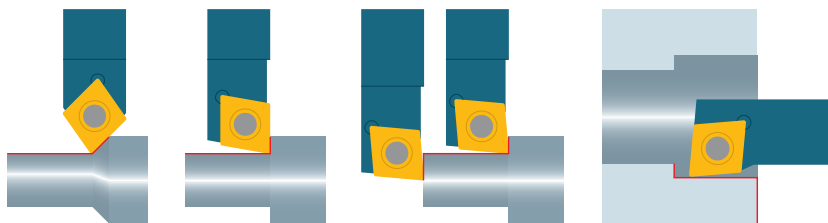
Klemmung Fixation Clamping		
Index		
S	Geschraubt Vissé Screwed	

Plattenform Forme de plaquette Form of insert		
Index	α	
V	35°	
D	55°	
C	80°	

Freiwinkel Angle de dépouille Clearance angle		
Index	α	
C	7°	
N	0°	
P	11°	

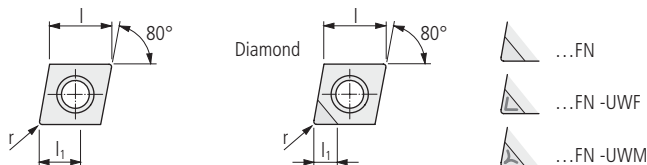
Schneidrichtung Direction de coupe Cutting direction		
Index		
L	Links A gauche Left	
N	Neutral Neutre Neutral	
R	Rechts A droite Right	

Halterform Forme du porte-outil Holder form											
Index	α		Index	α		Index	α		Index	α	
A	90°		H	107.5°		N	63°		U	93°	
F	90°		J	93°		O	117.5°		X	55°	
D	45°		L	95°		Q	90°				



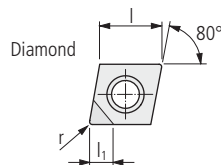
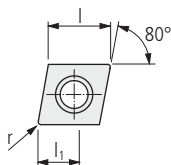
Typ Type Type	Ausführung Exécution Execution	Dimensionen Dimensions Dimensions			Bezeichnung Désignation Designation	Hartmetall Carbure Carbide												Cermet Cermet Cermet			Diamant Diamant Diamant			Halter Porte-outil Holder
		l	r	l ₁		-	-	○	●	●	-	●	●	●	●	●	●	●	●	●	-	-	-	
CC...						-	-	○	●	●	-	●	●	●	●	●	●	●	●	●	-	-	-	□ 123...
						○	○	●	●	●	-	○	○	○	○	○	○	○	○	○	-	-	-	
						○	-	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
						●	○	○	-	-	●	○	-	○	-	○	-	-	-	-	●	●	●	
						UHM 10	UHM 10 SX	UHM 10 HX	UHM 20 HPX	UHM 20 MZ	UHM 30	UHM 30 SX	UHM 30 MZ	UHM 30 HX	UCM 10	UCM 10 HX	UCM 10 MZ	UCVD 08	UPCD 15	UPCD 20				
						...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
 -FN		6.4	0.1	3.5	CCGT 060201 FN																■	□	SC...06	
		6.4	0.2	3.4	CCGT 060202 FN																■	□	SC...06	
		6.4	0.4	3.5	CCGT 060204 FN																■	□	SC...06	
		6.4	0.8	3	CCGT 060208 FN																□	□	SC...06	
		9.7	0.2	4.5	CCGT 09T302 FN																■	□	SC...09	
		9.7	0.4	4.3	CCGT 09T304 FN																■	□	SC...09	
		9.7	0.8	4.1	CCGT 09T308 FN																■	□	SC...09	
		12.9	0.4	4.3	CCGT 120404 FN																□	□	SC...12	
		12.9	0.8	4.1	CCGT 120408 FN																□	□	SC...12	
 -FN		6.4	0.2	3.4	CCGW 060202 FN																■	□	SC...06	
		6.4	0.4	3.2	CCGW 060204 FN																■	■	SC...06	
		6.4	0.8	3	CCGW 060208 FN																□	□	SC...06	
		9.7	0.2	4.5	CCGW 09T302 FN																■	□	SC...09	
		9.7	0.4	4.3	CCGW 09T304 FN																□	□	SC...09	
		9.7	0.8	4.1	CCGW 09T308 FN																□	□	SC...09	
		12.9	0.4	4.3	CCGW 120404 FN																■	□	SC...12	
		12.9	0.8	4.1	CCGW 120408 FN																□	□	SC...12	
 -PA3		6.4	0.2	4	CCGT 060202 FN -PA3	■		■																SC...06
		6.4	0.4	4	CCGT 060204 FN -PA3	■		■																SC...06
		9.7	0.4	4	CCGT 09T304 FN -PA3	■		■																SC...09
		9.7	0.8	4	CCGT 09T308 FN -PA3	■		■																SC...09
 -PA5		6.4	0.2	4	CCGT 060202 FN -PA5	■		■																SC...06
		6.4	0.4	4	CCGT 060204 FN -PA5	■		■																SC...06
		9.7	0.4	6	CCGT 09T304 FN -PA5	■		■																SC...09
		12.9	0.4	8	CCGT 120404 FN -PA5	■		■																SC...12
		12.9	0.8	8	CCGT 120408 FN -PA5	■		■																SC...12

Fortsetzung | Suite | Continuation



Typ Type Type	Ausführung Exécution Execution	Dimensionen Dimensions Dimensions			Bezeichnung Désignation Designation	Hartmetall Carbure Carbide										Cermet Cermet Cermet			Diamant Diamant Diamond			Halter Porte-outil Holder
		l	r	l ₁		-	-	○	●	●	-	●	●	●	●	●	●	●	-	-	-	
						-	○	●	●	○	-	●	●	●	○	-	○	-	-	-	-	
CC...						○	-	○	-	-	-	-	-	-	-	-	-	-	-	123...		
						UHM 10	UHM 10 SX	UHM 10 HX	UHM 20 HPX	UHM 20 MZ	UHM 30	UHM 30 SX	UHM 30 MZ	UHM 30 HX	UCM 10	UCM 10 HX	UCM 10 MZ	UCVD 08	UPCD 15	UPCD 20		
 -PA7		6.4	0.05	4	CCGT 0602005 FN -PA7	□		□													SC...06	
		6.4	0.1	4	CCGT 060201 FN -PA7	□		□														SC...06
		6.4	0.2	4	CCGT 060202 FN -PA7	■	□	■														SC...06
		6.4	0.4	4	CCGT 060204 FN -PA7	■	□	■														SC...06
		9.7	0.05	6	CCGT 09T3005 FN -PA7	□		□														SC...09
		9.7	0.1	6	CCGT 09T301 FN -PA7	□		□														SC...09
		9.7	0.2	6	CCGT 09T302 FN -PA7	■	■	■														SC...09
		9.7	0.4	6	CCGT 09T304 FN -PA7	■	■	■														SC...09
		9.7	0.8	6	CCGT 09T308 FN -PA7	■	■	■														SC...09
		12.9	0.2	8	CCGT 120402 FN -PA7	■	■	■														SC...12
		12.9	0.4	8	CCGT 120404 FN -PA7	■	■	■														SC...12
12.9	0.8	8	CCGT 120408 FN -PA7	■	■	■														SC...12		
 -PA9		6.4	0.2	4	CCXT 060202 EN PA9	□		□													SC...06	
		6.4	0.4	4	CCXT 060204 EN PA9	□		□													SC...06	
		9.7	0.2	6	CCXT 09T302 EN PA9	□		□													SC...09	
		9.7	0.4	6	CCXT 09T304 EN PA9	□		□														SC...09
		9.7	0.8	6	CCXT 09T308 EN PA9	□		□														SC...09
		12.9	0.4	8	CCXT 120404 EN PA9	□		□														SC...12
		12.9	0.8	8	CCXT 120408 EN PA9	□		□														SC...12
 -PF		6.4	0.2	1.5	CCGT 060202 EN -PF					■			■		■	□					SC...06	
		6.4	0.4	1.5	CCGT 060204 EN -PF										■	□	□					SC...06
		9.7	0.2	2	CCGT 09T302 EN -PF										■	□	□					SC...09
		9.7	0.4	2	CCGT 09T304 EN -PF										■	■	□					SC...09
		9.7	0.8	2	CCGT 09T308 EN -PF										□	□						SC...09
		12.9	0.4	3.2	CCGT 120404 EN -PF										■	■						SC...12
		6.4	0.4	1.5	CCMT 060204 EN -PF					■			■									SC...06
		9.7	0.4	1.5	CCMT 09T304 EN -PF					■			■									SC...09
		9.7	0.8	2	CCMT 09T308 EN -PF					■												SC...09
		12.9	0.4	3.2	CCMT 120404 EN -PF					■												SC...12
		12.9	0.8	3.2	CCMT 120408 EN -PF					■												SC...12
 -PF23		6.4	0.05	2	CCGT 0602005 FN -PF23						□			■							SC...06	
		6.4	0.1	2	CCGT 060201 FN -PF23						□			■							SC...06	
		9.7	0.05	3	CCGT 09T3005 FN -PF23						□			■							SC...09	
		9.7	0.1	3	CCGT 09T301 FN -PF23						□			■								SC...09
		9.7	0.2	3	CCGT 09T302 FN -PF23						□			■								SC...09

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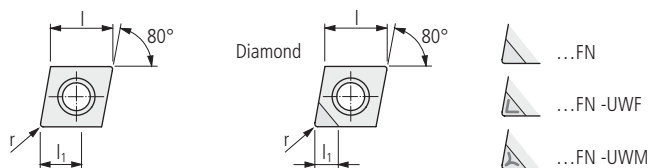


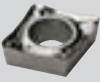
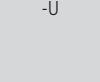
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Tooling for High Technology

Typ Type Type	Ausführung Exécution Execution	Dimensionen Dimensions Dimensions			Bezeichnung Désignation Designation	Hartmetall Carbure Carbide												Cermet Cermet Cermet		Diamant Diamant Diamant		Halter Porte-outil Holder
		l	r	l ₁		-	-	○	●	●	-	●	●	●	●	●	●	●	●	-	-	
CC...						-	-	○	●	●	-	●	●	●	●	●	●	●	●	-	-	
						○	-	●	-	-	○	-	-	-	-	-	-	-	-	-	-	
						○	-	●	-	-	○	-	-	-	-	-	-	-	-	-	-	
						●	○	○	○	-	-	○	-	-	-	-	-	-	-	●	●	□ 123...
						... UHM 10													... UCM 10			
						... UHM 10 SX													... UCM 10 HX			
						... UHM 10 HX													... UCM 10 MZ			
						... UHM 20 HPX													... UCM 10 MZ			
						... UHM 20 MZ													... UCVD 08			
						... UHM 30													... UPCD 15			
						... UHM 30 SX													... UPCD 20			
						... UHM 30 MZ																
						... UHM 30 HX																
						... UCM 10																
						... UCM 10 HX																
						... UCM 10 MZ																
						... UCVD 08																
						... UPCD 15																
						... UPCD 20																
 -PF33		6.4	0.05	2	CCGT 0602005 FN -PF33																	SC...06
		6.4	0.1	2	CCGT 060201 FN -PF33																	SC...06
		6.4	0.2	2	CCGT 060202 FN -PF33																	SC...06
		6.4	0.4	2	CCGT 060204 FN -PF33																	SC...06
		9.7	0.05	3	CCGT 09T3005 FN -PF33																	SC...09
		9.7	0.1	3	CCGT 09T301 FN -PF33																	SC...09
		9.7	0.2	3	CCGT 09T302 FN -PF33																	SC...09
		9.7	0.4	3	CCGT 09T304 FN -PF33																	SC...09
 -PF43		6.4	0.2	2.6	CCMT 060202 EN -PF43																	SC...06
		6.4	0.4	2.6	CCMT 060204 EN -PF43																	SC...06
		9.7	0.2	4	CCMT 09T302 EN -PF43																	SC...09
		9.7	0.4	4	CCMT 09T304 EN -PF43																	SC...09
		9.7	0.8	4	CCMT 09T308 EN -PF43																	SC...09
 -PM		6.4	0.2	2	CCGT 060202 EN -PM																	SC...06
		6.4	0.4	2	CCMT 060204 EN -PM																	SC...06
		6.4	0.8	2	CCMT 060208 EN -PM																	SC...06
		9.7	0.4	3.2	CCMT 09T304 EN -PM																	SC...09
		9.7	0.8	3.2	CCMT 09T308 EN -PM																	SC...09
		12.9	0.4	4.8	CCMT 120404 EN -PM																	SC...12
		12.9	0.8	4.8	CCMT 120408 EN -PM																	SC...12
 -PMF		6.4	0.4	2.2	CCMT 060204 EN -PMF																	SC...06
		6.4	0.8	2.2	CCMT 060208 EN -PMF																	SC...06
		9.7	0.4	3.3	CCMT 09T304 EN -PMF																	SC...09
		9.7	0.8	3.3	CCMT 09T308 EN -PMF																	SC...09
		12.9	0.4	4.6	CCMT 120404 EN -PMF																	SC...12
		12.9	0.8	4.6	CCMT 120408 EN -PMF																	SC...12
 -TOP UWF*		6.4	0.2	3	CCGT 060202 FN TOP UWF																	SC...06
		6.4	0.4	3	CCGT 060204 FN TOP UWF																	SC...06
		9.7	0.2	3	CCGT 09T302 FN TOP UWF																	SC...09
		9.7	0.4	3	CCGT 09T304 FN TOP UWF																	SC...09
		12.9	0.2	3	CCGT 120402 FN TOP UWF																	SC...12
		12.9	0.4	3	CCGT 120404 FN TOP UWF																	SC...12
 -TOP UWM*		6.4	0.2	3	CCGT 060202 FN TOP UWM																	SC...06
		6.4	0.4	3	CCGT 060204 FN TOP UWM																	SC...06
		9.7	0.2	3	CCGT 09T302 FN TOP UWM																	SC...09
		9.7	0.4	3	CCGT 09T304 FN TOP UWM																	SC...09
		12.9	0.2	3	CCGT 120402 FN TOP UWM																	SC...12
		12.9	0.4	3	CCGT 120404 FN TOP UWM																	SC...12

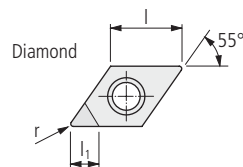
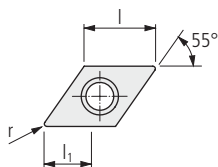
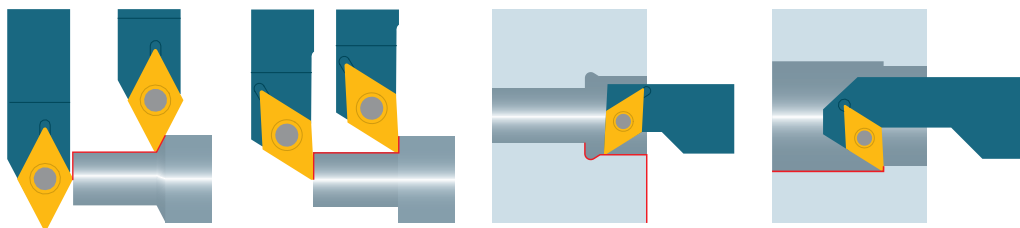
Fortsetzung | Suite | Continuation



Type Type	Ausführung Exécution Execution	Dimensionen Dimensions Dimensions			Bezeichnung Désignation Designation	Hartmetall Carbure Carbide										Cermet Cermet Cermet			Diamant Diamant Diamond			Halter Porte-outil Holder
		l	r	l ₁		-	-	○	●	●	-	●	●	●	●	●	●	-	-	-		
						-	○	●	●	○	-	●	●	●	○	-	○	-	-	-		
CC...						○	-	○	●	-	-	○	●	●	○	-	-	-	□ 123...			
						●	○	○	○	○	○	○	○	○	○	-	●	●				
						UHM 10	UHM 10 SX	UHM 10 HX	UHM 20 HPX	UHM 20 MZ	UHM 30	UHM 30 SX	UHM 30 MZ	UHM 30 HX	UCM 10	UCM 10 HX	UCM 10 MZ	UCVD 08	UPCD 15	UPCD 20		
		6.4	0.4	2.8	CCGT 060204 FN -TOP5	■		■													SC...06	
-TOP5*		9.7	0.4	4.6	CCGT 09T304 FN -TOP5	■		■													SC...09	
		9.7	0.8	4.6	CCGT 09T308 FN -TOP5	□		□													SC...09	
		12.9	0.4	6.1	CCGT 120404 FN -TOP5	■		■													SC...12	
		12.9	0.8	6.1	CCGT 120408 FN -TOP5	□		□													SC...12	
		6.4	0	2.5	CCET 060200 FL -U	□		□													SC...06	
		6.4	0.03	2.5	CCET 0602003 FL -U	□		□													SC...06	
		6.4	0.1	2.5	CCET 060201 FL -U	□		□													SC...06	
		6.4	0.2	2.5	CCET 060202 FL -U	□		□						□	□						SC...06	
		9.7	0	4	CCET 09T300 FL -U	□		□													SC...09	
		9.7	0.03	4	CCET 09T3003 FL -U	□		□													SC...09	
		9.7	0.1	4	CCET 09T301 FL -U	□		□													SC...09	
		9.7	0.2	4	CCET 09T302 FL -U	□		□						□	□						SC...09	
		6.4	0	2.5	CCET 060200 FR -U	□		□													SC...06	
		6.4	0.03	2.5	CCET 0602003 FR -U	□		□													SC...06	
		6.4	0.1	2.5	CCET 060201 FR -U	□		□													SC...06	
		6.4	0.2	2.5	CCET 060202 FR -U	□		□						□	□						SC...06	
		9.7	0	4	CCET 09T300 FR -U	□		□													SC...09	
		9.7	0.03	4	CCET 09T3003 FR -U	□		□													SC...09	
		9.7	0.1	4	CCET 09T301 FR -U	□		□													SC...09	
		9.7	0.2	4	CCET 09T302 FR -U	□		□						□	□						SC...09	
		6.4	0.1	3	CCGT 060201 FN UWF													□	□		SC...06	
		6.4	0.2	3	CCGT 060202 FN UWF													□	■		SC...06	
		6.4	0.4	3	CCGT 060204 FN UWF													□	■		SC...06	
		6.4	0.8	3	CCGT 060208 FN UWF													□	■		SC...06	
		9.7	0.1	3	CCGT 09T301 FN UWF													□	□		SC...09	
		9.7	0.2	3	CCGT 09T302 FN UWF													□	■		SC...09	
		9.7	0.4	3	CCGT 09T304 FN UWF													□	■		SC...09	
		9.7	0.8	3	CCGT 09T308 FN UWF													□	■		SC...09	
		12.9	0.2	3	CCGT 120402 FN UWF													□	□		SC...09	
		12.9	0.4	3	CCGT 120404 FN UWF													□	□		SC...12	
		12.9	0.8	3	CCGT 120408 FN UWF													□	□		SC...12	
		6.4	0.2	3	CCGT 060202 FN UWM													□	■	□	SC...06	
		6.4	0.4	3	CCGT 060204 FN UWM													□	■	□	SC...06	
		6.4	0.8	3	CCGT 060208 FN UWM													□	□	□	SC...06	
		9.7	0.1	3	CCGT 09T301 FN UWM													□	□		SC...09	
		9.7	0.2	3	CCGT 09T302 FN UWM													□	□	□	SC...09	
		9.7	0.4	3	CCGT 09T304 FN UWM													□	□	□	SC...09	
		9.7	0.8	3	CCGT 09T308 FN UWM													□	■	□	SC...09	
		12.9	0.2	3	CCGT 120402 FN UWM													□	□	□	SC...12	
		12.9	0.4	3	CCGT 120404 FN UWM													□	□	□	SC...12	
		12.9	0.8	3	CCGT 120408 FN UWM													□	□	□	SC...12	

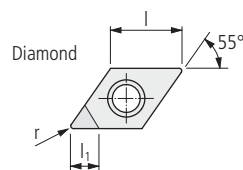
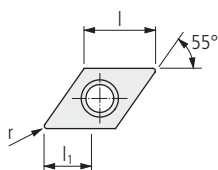
* Beschreibung TOP | Description TOP | Description TOP □ 17

Legende | Légende | Legend □ 4



Typ Type Type	Ausführung Exécution Execution	Dimensionen Dimensions Dimensions			Bezeichnung Désignation Designation	Hartmetall Carbure Carbide												Cermet Cermet Cermet			Diamant Diamant Diamond			Halter Porte-outil Holder
		l	r	l ₁		-	-	○	●	●	-	●	●	●	●	●	●	●	-	-	-			
						-	○	●	●	○	-	●	●	●	●	○	●	○	-	-	-			
						○	-	○	-	○	-	○	-	○	-	○	-	-	-	-	-	-		
DC...					●	○	○			●			○			-	-	-	□ 125...					
						UHM 10 ...	UHM 10 SX ...	UHM 10 HX ...	UHM 20 HPX ...	UHM 20 MZ ...	UHM 30 ...	UHM 30 SX ...	UHM 30 MZ ...	UHM 30 HX ...	UCM 10 ...	UCM 10 HX ...	UCM 10 MZ ...	UCVD 08 ...	UPCD 15 ...	UPCD 20 ...				
 -A3		7.75	0.06	4.1	DCGT 0702006 FN -A3	■	□	■														SD...07		
		7.75	0.15	4.1	DCGT 0702015 FN -A3	■	□	■														SD...07		
		7.75	0.35	4.1	DCGT 0702035 FN -A3	■	□	■														SD...07		
		11.6	0.08	7.2	DCGT 11T3008 FN -A3	■	□	■														SD...11		
		11.6	0.15	7.2	DCGT 11T3015 FN -A3	■	□	■														SD...11		
		11.6	0.35	7.2	DCGT 11T3035 FN -A3	■	□	■														SD...11		
 -FL -FN -FR		7.75	0.4	5.5	DCGT 070204 FL														□	□		SD...07		
		7.75	0.8	5.0	DCGT 070208 FL															□	□		SD...07	
		11.6	0.4	7.5	DCGT 11T304 FL															□	□		SD...11	
		11.6	0.8	7.0	DCGT 11T308 FL															□	□		SD...11	
		7.75	0.1	3.8	DCGT 070201 FN																■		SD...07	
		7.75	0.2	3.7	DCGT 070202 FN															■	□		SD...07	
		7.75	0.4	3.4	DCGT 070204 FN															■			SD...07	
		7.75	0.8	3	DCGT 070208 FN															□			SD...07	
		11.6	0.1	4.8	DCGT 11T301 FN																□		SD...11	
		11.6	0.2	4.7	DCGT 11T302 FN															■	□		SD...11	
		11.6	0.4	4.3	DCGT 11T304 FN															■			SD...11	
		11.6	0.8	4	DCGT 11T308 FN															■			SD...11	
		7.75	0.4	5.5	DCGT 070204 FR															□	□		SD...07	
		7.75	0.8	5	DCGT 070208 FR															□	□		SD...07	
		11.6	0.4	7.5	DCGT 11T304 FR															□	□		SD...11	
		11.6	0.8	7	DCGT 11T308 FR															□	□		SD...11	
 -FN		7.75	0.1	3.8	DCGW 070201 FN																■		SD...07	
		7.75	0.2	3.7	DCGW 070202 FN															■	■		SD...07	
		7.75	0.4	3.4	DCGW 070204 FN															□	□		SD...07	
		7.75	0.8	3	DCGW 070208 FN															□	□		SD...07	
		11.6	0.2	4.7	DCGW 110302 FN															□			SD...11	
		11.6	0.4	4.3	DCGW 110304 FN															□			SD...11	
		11.6	0.8	4	DCGW 110308 FN															□			SD...11	
		11.6	0.1	4.8	DCGW 11T301 FN																□		SD...11	
		11.6	0.2	4.7	DCGW 11T302 FN															■	□		SD...11	
		11.6	0.4	4.3	DCGW 11T304 FN															■	■		SD...11	
		11.6	0.8	4	DCGW 11T308 FN															□	□		SD...11	

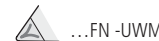
113



...FN



...FN -UWF

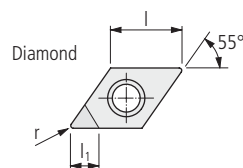
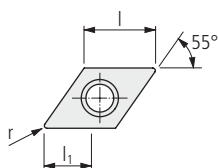


...FN -UWM

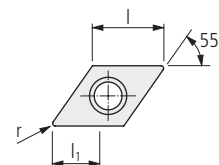
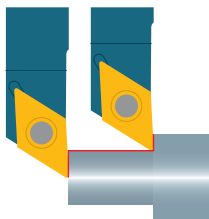
Type Type	Ausführung Exécution Execution	Dimensions Dimensions			Bezeichnung Désignation Designation	Hartmetall Carbure Carbide										Cermet Cermet Cermet			Diamant Diamant Diamond			Halter Porte-outil Holder
		l	r	l ₁		-	-	○	●	●	-	●	●	●	●	●	●	-	-	-		
						○	○	○	-	-	○	○	-	-	○	-	-	○	-	-	-	
DC...						○	○	○	-	-	○	○	-	-	○	-	-	-	□ 125...			
						UHM 10 ...	UHM 10 SX ...	UHM 10 HX ...	UHM 20 HPX ...	UHM 20 MZ ...	UHM 30 ...	UHM 30 SX ...	UHM 30 MZ ...	UHM 30 HX ...	UCM 10 ...	UCM 10 HX ...	UCM 10 MZ ...	UCVD 08 ...	UPCD 15 ...	UPCD 20 ...		
 -PF23		7.75	0.05	3.6	DCGT 0702005 FN -PF23						□			■							SD...07	
		7.75	0.1	3.6	DCGT 070201 FN -PF23						□			■							SD...07	
		7.75	0.2	3.6	DCGT 070202 FN -PF23						□			■							SD...07	
		11.6	0.05	5.2	DCGT 11T3005 FN -PF23						□			■							SD...11	
		11.6	0.1	5.2	DCGT 11T301 FN -PF23						■			■							SD...11	
		11.6	0.2	5.2	DCGT 11T302 FN -PF23						■			■							SD...11	
 -PF33		7.75	0.05	3.6	DCGT 0702005 FN -PF33						□			□							SD...07	
		7.75	0.1	3.6	DCGT 070201 FN -PF33						□			□							SD...07	
		7.75	0.2	3.6	DCGT 070202 FN -PF33						□			□							SD...07	
		7.75	0.4	3.6	DCGT 070204 FN -PF33						□			□							SD...07	
		11.6	0.05	5.2	DCGT 11T3005 FN -PF33						□			□							SD...11	
		11.6	0.1	5.2	DCGT 11T301 FN -PF33						□			□							SD...11	
		11.6	0.2	5.2	DCGT 11T302 FN -PF33						□			□							SD...11	
		11.6	0.4	5.2	DCGT 11T304 FN -PF33						□			□							SD...11	
 -PF43		7.75	0.2	3.8	DCMT 070202 EN -PF43								■							SD...07		
		7.75	0.4	3.8	DCMT 070204 EN -PF43								■							SD...07		
		11.6	0.2	5.5	DCMT 11T302 EN -PF43								■							SD...11		
		11.6	0.4	5.5	DCMT 11T304 EN -PF43								■							SD...11		
		11.6	0.8	5.5	DCMT 11T308 EN -PF43								■							SD...11		
 -PM		7.75	0.2	2.6	DCGT 070202 EN -PM					■			■							SD...07		
		7.75	0.4	2.6	DCMT 070204 EN -PM					■			■							SD...07		
		7.75	0.8	2.6	DCMT 070208 EN -PM								■							SD...07		
		11.6	0.4	4.1	DCMT 11T304 EN -PM					■			■							SD...11		
		11.6	0.8	4.1	DCMT 11T308 EN -PM					■			■							SD...11		
 -PMF		7.75	0.4	3	DCMT 070204 EN -PMF					□			□							SD...07		
		11.6	0.4	4.6	DCMT 11T304 EN -PMF					□			□		□				SD...11			
		11.6	0.8	4.6	DCMT 11T308 EN -PMF					□			□		□				SD...11			
 -TOP UWF*		7.75	0.2	3	DCGT 070202 FL TOP UWF												□	□		SD...07		
		7.75	0.2	3	DCGT 070202 FL TOP UWF												□	□		SD...07		
		11.6	0.2	3	DCGT 11T302 FL TOP UWF												□	□		SD...11		
		11.6	0.4	3	DCGT 11T304 FL TOP UWF												□	□		SD...11		
		7.75	0.2	3	DCGT 070202 FR TOP UWF													□	□		SD...07	
		7.75	0.4	3	DCGT 070204 FR TOP UWF													□	□		SD...07	
		11.6	0.2	3	DCGT 11T302 FR TOP UWF													□	□		SD...11	
		11.6	0.4	3	DCGT 11T304 FR TOP UWF													□	□		SD...11	

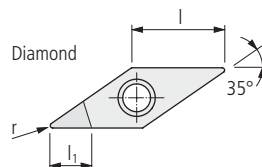
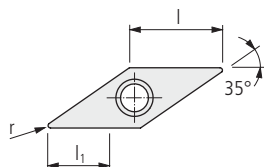
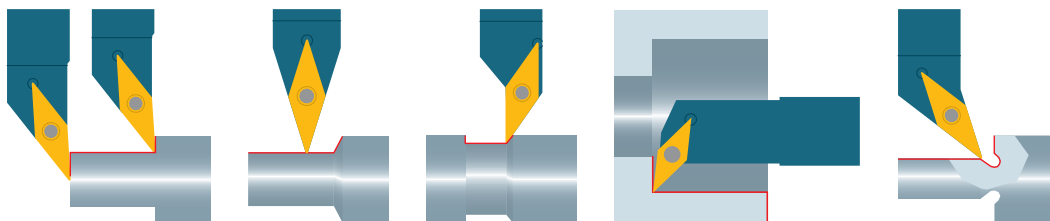
Legende | Légende | Legend  4

Fortsetzung | Suite | Continuation



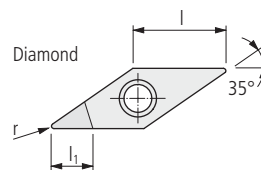
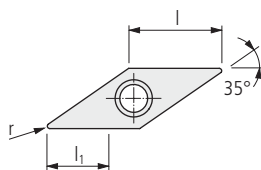
Typ Type Type	Ausführung Exécution Execution	Dimensionen Dimensions Dimensions			Bezeichnung Désignation Designation	Hartmetall Carbure Carbide												Cermet Céramet Cermet			Diamant Diamant Diamond			Halter Porte-outil Holder
		l	r	l ₁		-	-	○	●	●	-	●	●	●	●	●	●	●	●	●	-	-	-	
DC...						-	-	○	●	●	-	●	●	●	●	●	●	●	●	●	-	-	-	□ 125...
						○	○	●	-	○	-	○	-	-	-	-	-	-	-	-	-	-	-	
						○	○	○	-	-	○	-	-	-	-	-	-	-	-	-	-	-	-	
						○	○	○	-	-	○	-	-	-	-	-	-	-	-	-	●	●	●	
						UHM 10	UHM 10 SX	UHM 10 HX	UHM 20 HPX	UHM 20 MZ	UHM 30	UHM 30 SX	UHM 30 MZ	UHM 30 HX	UCM 10	UCM 10 HX	UCM 10 MZ	UCVD 08	UPCD 15	UPCD 20				
 -US		7.75	0.1	0.6	DCET 070201 FL -US	□	□	□																SD...07
		7.75	0.2	0.6	DCET 070202 FL -US										□	□								SD...07
		7.75	0.1	0.6	DCET 070201 FR -US	□	□	□																SD...07
		7.75	0.2	0.6	DCET 070202 FR -US	□	□	□							□	□								SD...07
 -UWF		7.75	0.1	3	DCGT 070201 FN UWF															□	■			SD...07
		7.75	0.2	3	DCGT 070202 FN UWF															□	■			SD...07
		7.75	0.4	3	DCGT 070204 FN UWF															■	□			SD...07
		7.75	0.8	3	DCGT 070208 FN UWF															□	□			SD...07
		11.6	0.1	3	DCGT 11T301 FN UWF															■	■			SD...11
		11.6	0.2	3	DCGT 11T302 FN UWF															■	■			SD...11
		11.6	0.4	3	DCGT 11T304 FN UWF															■	■			SD...11
		11.6	0.8	3	DCGT 11T308 FN UWF															□	■			SD...11
 -UWM		7.75	0.2	3	DCGT 070202 FN UWM															□	■			SD...07
		7.75	0.4	3	DCGT 070204 FN UWM															■	□			SD...07
		7.75	0.8	3	DCGT 070208 FN UWM															□	□			SD...07
		11.6	0.2	3	DCGT 11T302 FN UWM															■	■	□		SD...11
		11.6	0.4	3	DCGT 11T304 FN UWM															■	■	□		SD...11
		11.6	0.8	3	DCGT 11T308 FN UWM															□	■	□		SD...11

[illegible]



Typ Type Type	Ausführung Exécution Execution	Dimensionen Dimensions Dimensions			Bezeichnung Désignation Designation	Hartmetall Carbure Carbide												Cermet Cermet Cermet			Diamant Diamant Diamond			Halter Porte-outil Holder
		l	r	l ₁		-	-	○	●	●	-	●	●	●	●	●	●	●	-	-	-			
						-	○	●	●	○	-	●	●	-	●	●	-	○	-	-	-			
VC...						○	○	○	●	●	-	●	●	○	-	○	-	-	-	📄 130...				
						UHM 10 ...	UHM 10 SX ...	UHM 10 HX ...	UHM 20 HPX ...	UHM 20 MZ ...	UHM 30 ...	UHM 30 SX ...	UHM 30 MZ ...	UHM 30 HX ...	UCM 10 ...	UCM 10 HX ...	UCM 10 MZ ...	UCVD 08 ...	UPCD 15 ...	UPCD 20 ...				
 -A3		11.1	0.08	6	VCGT 1103008 FN -A3	■	□	■													SV...11			
		11.1	0.15	6	VCGT 1103015 FN -A3	■	□	■													SV...11			
		11.1	0.35	6	VCGT 1103035 FN -A3	■	□	■													SV...11			
		13	0.15	6.8	VCGT 1303015 FN -A3	■	□	■													SV...13			
		13	0.35	6.8	VCGT 1303035 FN -A3	■	□	■													SV...13			
		13	0.75	6.8	VCGT 1303075 FN -A3	■	□	■													SV...13			
 -FL -FN -FR		11.1	0.4	6.5	VCGT 110304 FL													□	□		SV...11			
		11.1	0.8	6	VCGT 110308 FL														□	□		SV...11		
		16.6	0.4	7.5	VCGT 160404 FL															□	□	SV...16		
		16.6	0.8	7	VCGT 160408 FL															□	□	SV...16		
		11.1	0.1	5.4	VCGT 110301 FN															□	□	SV...11		
		11.1	0.2	4.6	VCGT 110302 FN															□	□	SV...11		
		11.1	0.4	3.9	VCGT 110304 FN																□	SV...11		
		11.1	0.8	3.3	VCGT 110308 FN															□		SV...11		
		16.6	0.1	6	VCGT 160401 FN															□	□	SV...16		
		16.6	0.2	5.9	VCGT 160402 FN															□	□	SV...16		
		16.6	0.4	5.5	VCGT 160404 FN															□	□	SV...16		
		16.6	0.8	5	VCGT 160408 FN															□		SV...16		
		11.1	0.4	6.5	VCGT 110304 FR															□	□	SV...11		
		11.1	0.8	6	VCGT 110308 FR															□	□	SV...11		
		16.6	0.4	7.5	VCGT 160404 FR															□	□	SV...16		
		16.6	0.8	7	VCGT 160408 FR															□	□	SV...16		
 -FN		11.1	0.2	4.6	VCGW 110302 FN														■	□	SV...11			
		11.1	0.4	3.9	VCGW 110304 FN														■	□	SV...11			
		11.1	0.8	3.3	VCGW 110308 FN														■	□	SV...11			
		13	0.2	5.9	VCGW 130302 FN															□	□	SV...13		
		13	0.4	5.5	VCGW 130304 FN															□	□	SV...13		
		16.6	0.2	5.9	VCGW 160402 FN															□	□	SV...16		
		16.6	0.4	5.5	VCGW 160404 FN															■	□	SV...16		
		16.6	0.8	5	VCGW 160408 FN															■	□	SV...16		

Fortsetzung | Suite | Continuation



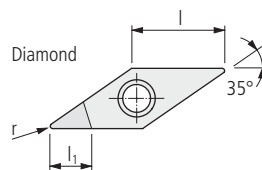
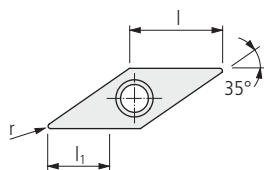
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...FN -UWF

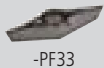
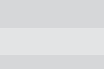
...FN -UWM

Typ Type Type	Ausführung Exécution Execution	Dimensionen Dimensions Dimensions			Bezeichnung Désignation Designation	Hartmetall Carbure Carbide												Cermet Cermet Cermet		Diamant Diamant Diamond		Halter Porte-outil Holder
		l	r	l ₁		-	-	○	●	●	-	●	●	●	●	●	●	●	●	-	-	
VC...						-	-	○	●	●	-	●	●	●	●	●	●	●	●	-	-	
						○	-	○	-	-	○	-	○	-	-	-	-	-	-	-	-	
						○	-	○	-	-	○	-	○	-	-	-	-	-	-	-	-	
						●	○	○	-	-	-	○	-	○	-	-	-	-	-	●	●	
						... UHM 10	... UHM 10 SX	... UHM 10 HX	... UHM 20 HPX	... UHM 20 MZ	... UHM 30	... UHM 30 SX	... UHM 30 MZ	... UHM 30 HX	... UCM 10	... UCM 10 HX	... UCM 10 MZ	... UCVD 08	... UPD 15	... UPD 20		□ 130...
 -PA5		11.1	0.2	6.8	VCGT 110302 FN -PA5	■		■														SV...11
		11.1	0.4	6.8	VCGT 110304 FN -PA5	■		■														SV...11
		16.6	0.4	8.9	VCGT 160404 FN -PA5	■		■														SV...16
		16.6	0.8	8.9	VCGT 160408 FN -PA5	■		■														SV...16
 -PA7		11.1	0.05	5.5	VCGT 1103005 FN -PA7	□		□														SV...11
		11.1	0.1	5.5	VCGT 110301 FN -PA7	□		□														SV...11
		11.1	0.2	5.5	VCGT 110302 FN -PA7	■	■	■														SV...11
		11.1	0.4	5.5	VCGT 110304 FN -PA7	■	■	■														SV...11
		11.1	0.8	5.5	VCGT 110308 FN -PA7	■	■	■														SV...11
		16.6	0.05	8.9	VCGT 1604005 FN -PA7	□		□														SV...16
		16.6	0.1	8.9	VCGT 160401 FN -PA7	□		□														SV...16
		16.6	0.4	8.9	VCGT 160404 FN -PA7	■	■	■														SV...16
		16.6	0.8	8.9	VCGT 160408 FN -PA7	■	■	■														SV...16
 -PA9		16.6	0.4	8.9	VCXT 160404 EN -PA9	□		□														SV...16
		16.6	0.8	8.9	VCXT 160408 EN -PA9	□		□														SV...16
 -PF		11.1	0.2	4.8	VCGT 110302 EN -PF					■			■		■	■	■					SV...11
		11.1	0.4	4.8	VCGT 110304 EN -PF					■			■		■	■	■					SV...11
		11.1	0.8	4.8	VCGT 110308 EN -PF					□			■									SV...11
		16.6	0.4	6	VCMT 160404 EN -PF					■			■									SV...16
 -PF		16.6	0.8	6	VCMT 160408 EN -PF					■												SV...16
 -PF23		16.6	0.4	6	VCGT 160404 EN -PF										■	■	□					SV...16
		16.6	0.8	6	VCGT 160408 EN -PF										■	□	□					SV...16
		11.1	0.05	4.8	VCGT 1103005 FN -PF23						□				■							SV...11
		11.1	0.1	4.8	VCGT 110301 FN -PF23						□				■							SV...11
		11.1	0.2	4.8	VCGT 110302 FN -PF23						□				■							SV...11
		16.6	0.05	8.4	VCGT 1604005 FN -PF23						□				■							SV...16
		16.6	0.1	8.4	VCGT 160401 FN -PF23						□				■							SV...16
		16.6	0.2	8.4	VCGT 160402 FN -PF23						□				■							SV...16

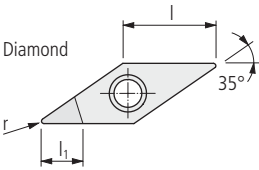
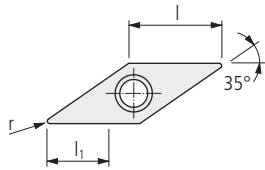
Fortsetzung | Suite | Continuation



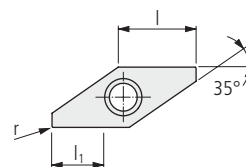
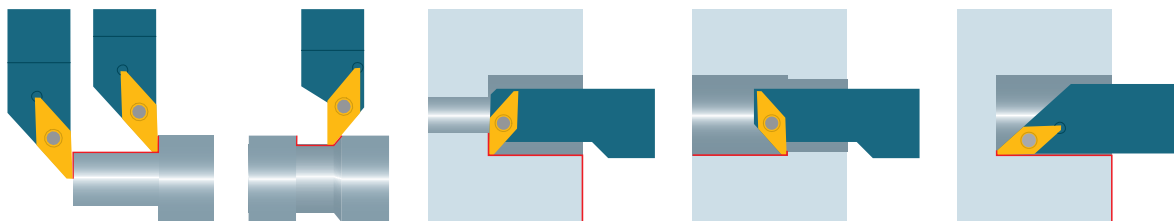
120

Typ Type Type	Ausführung Exécution Execution	Dimensionen Dimensions Dimensions			Bezeichnung Désignation Designation	Hartmetall Carbure Carbide										Cermet Céramet Céramet		Diamant Diamant Diamond		Halter Porte-outil Holder
		l	r	l ₁		-	-	○	●	●	-	●	●	●	●	●	●	-	-	
VC...						-	-	○	●	●	-	●	●	●	●	●	●	-	-	
						○	○	●	●	○	-	○	-	-	○	○	○	-	-	
						○	-	●	-	-	○	-	-	-	-	-	-	-	-	
						●	○	○	-	-	○	○	-	-	-	-	●	●	●	
						... UHM 10	... UHM 10 SX	... UHM 10 HX	... UHM 20 HPX	... UHM 20 MZ	... UHM 30	... UHM 30 SX	... UHM 30 MZ	... UHM 30 HX	... UCM 10	... UCM 10 HX	... UCM 10 MZ	... UCVD 08	... UPCD 15	... UPCD 20
 -PF33		11.1	0.05	4.8	VCGT 1103005 FN -PF33						□			□						SV...11
		11.1	0.1	4.8	VCGT 110301 FN -PF33						□			□						SV...11
		11.1	0.2	4.8	VCGT 110302 FN -PF33						□			□						SV...11
		11.1	0.4	4.8	VCGT 110304 FN -PF33						□			□						SV...11
		16.6	0.05	8.4	VCGT 1604005 FN -PF33						□			□						SV...16
		16.6	0.1	8.4	VCGT 160401 FN -PF33						□			□						SV...16
		16.6	0.2	8.4	VCGT 160402 FN -PF33						□			□						SV...16
 -PF43		11.1	0.2	4.8	VCMT 110302 EN -PF43								■							SV...11
		11.1	0.4	4.8	VCMT 110304 EN -PF43								■							SV...11
		16.6	0.4	7	VCMT 160404 EN -PF43								□							SV...16
		16.6	0.8	7	VCMT 160408 EN -PF43								□							SV...16
 -PM		16.6	0.4	6	VCMT 160404 EN -PM					■			■							SV...16
		16.6	0.8	6	VCMT 160408 EN -PM					■			■							SV...16
 -PMF		11.1	0.2	4.8	VCGT 110302 EN -PMF								■							SV...11
		11.1	0.4	4.8	VCMT 110304 EN -PMF						□		■	■						SV...11
		16.6	0.4	7	VCMT 160404 EN -PMF						□		■	■		□				SV...16
		16.6	0.8	7	VCMT 160408 EN -PMF						□		□	□		□				SV...16
 -TOP5*		11.1	0.4	7	VCGT 110304 FL -TOP5	■		■												SV...11
 -TOP5		11.1	0.4	7	VCGT 110304 FR -TOP5	■		■												SV...11
 -UWF		11.1	0.1	3	VCGT 110301 FN UWF												□	□	□	SV...11
		11.1	0.2	3	VCGT 110302 FN UWF												■	■	□	SV...11
		11.1	0.4	3.9	VCGT 110304 FN UWF													■	□	SV...11
		11.1	0.8	3	VCGT 110308 FN UWF												□	■		SV...11
		16.6	0.1	3	VCGT 160401 FN UWF												□			SV...16
		16.6	0.2	3	VCGT 160402 FN UWF												□	■	□	SV...16
		16.6	0.4	3	VCGT 160404 FN UWF												□	■	□	SV...16
		16.6	0.8	3	VCGT 160408 FN UWF												□	■	□	SV...16

Fortsetzung | Suite | Continuation

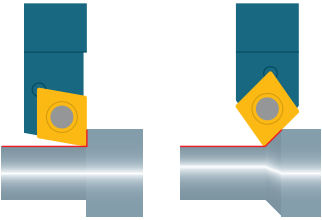


Typ Type Type	Ausführung Exécution Execution	Dimensionen Dimensions Dimensions			Bezeichnung Désignation Designation	Hartmetall Carbure Carbide												Cermet Cermet Cermet			Diamant Diamant Diamond			Halter Porte-outil Holder
		l	r	l ₁		-	-	○	●	●	-	●	●	●	●	●	●	●	●	●	-	-	-	
VC...						-	-	○	●	●	-	○	-	●	●	●	○	-	-	○	-	-	-	
						○	-	●	-	-	○	-	-	○	-	-	-	-	-	-	-	-	-	
						●	○	○	-	-	○	-	-	○	-	-	-	-	-	-	-	-	-	
						●	○	○	-	-	○	-	-	○	-	-	-	-	-	-	●	●	●	130...
						UHM 10	UHM 10 SX	UHM 10 HX	UHM 20 HPX	UHM 20 MZ	UHM 30	UHM 30 SX	UHM 30 MZ	UHM 30 HX	UCM 10	UCM 10 HX	UCM 10 MZ	UCVD 08	UPCD 15	UPCD 20				
						...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
 -UWM		11.1	0.1	3	VCGT 110301 FN UWM																			SV...11
		11.1	0.2	3	VCGT 110302 FN UWM																			SV...11
		11.1	0.4	3	VCGT 110304 FN UWM																			SV...11
		11.1	0.8	3	VCGT 110308 FN UWM																			SV...11
		16.6	0.1	3	VCGT 160401 FN UWM																			SV...16
		16.6	0.2	3	VCGT 160402 FN UWM																			SV...16
		16.6	0.4	3	VCGT 160404 FN UWM																			SV...16
		16.6	0.8	3	VCGT 160408 FN UWM																			SV...16

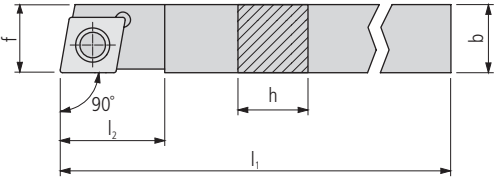


Typ Type Type	Ausführung Exécution Execution	Dimensionen Dimensions Dimensions			Bezeichnung Désignation Designation	Hartmetall Carbure Carbide										Cermet Cermet Cermet		Diamant Diamant Diamant		Halter Porte-outil Holder
		l	r	l ₁		-	-	○	●	●	-	●	●	●	●	●	●	-	-	
VP...						○	○	●	●	○	○	○	○	○	○	○	○	-	-	□ 131...
						UHM 10	UHM 10 SX	UHM 10 HX	UHM 20 HPX	UHM 20 MZ	UHM 30	UHM 30 SX	UHM 30 MZ	UHM 30 HX	UCM 10	UCM 10 HX	UCM 10 MZ	UCVD 08	UPCD 15	UPCD 20
						...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
		10	0	4.4	VPET 1003ZZ FL TOP						■	■		■						SV... ..
		10	0.08	4.4	VPET 1003008 FL TOP						■	■		■						SV... ..
		10	0.2	4.4	VPET 100302 FL TOP						■	■		■						SV... ..
		10	0.08	4.4	VPGT 1003008 EL TOP						■	□		■						SV... ..
		10	0.2	4.4	VPGT 100302 EL TOP								■							SV... ..
		10	0	4.4	VPGT 1003ZZ FL TOP						■	■		■						SV... ..
		10	0.08	4.4	VPGT 1003008 FL TOP						■	■		■						SV... ..
		10	0.2	4.4	VPGT 100302 FL TOP						■	■		■						SV... ..
		10	0.15	4.5	VPXT 1003015 EL TOP				■											SV... ..
		10	0.35	4.5	VPXT 1003035 EL TOP				■											SV... ..
	 -TOP*	10	0	4.4	VPET 1003ZZ FR TOP						■	■		■						SV... ..
		10	0.05	4.4	VPET 1003005 FR TOP						■	□		■						SV... ..
		10	0.08	4.4	VPET 1003008 FR TOP						■	■		■						SV... ..
		10	0.2	4.4	VPET 100302 FR TOP						■	■		■						SV... ..
		10	0.08	4.4	VPGT 1003008 ER TOP						■	■		■						SV... ..
		10	0.2	4.4	VPGT 100302 ER TOP								■							SV... ..
		10	0	4.4	VPGT 1003ZZ FR TOP						■	■		■						SV... ..
		10	0.05	4.4	VPGT 1003005 FR TOP						■	□		■						SV... ..
		10	0.08	4.4	VPGT 1003008 FR TOP						■	■		■						SV... ..
		10	0.2	4.4	VPGT 100302 FR TOP						■	■		■						SV... ..
		10	0.15	4.5	VPXT 1003015 ER TOP				■											SV... ..
		10	0.35	4.5	VPXT 1003035 ER TOP				■											SV... ..

* Beschreibung TOP | Description TOP | Description TOP □ 17

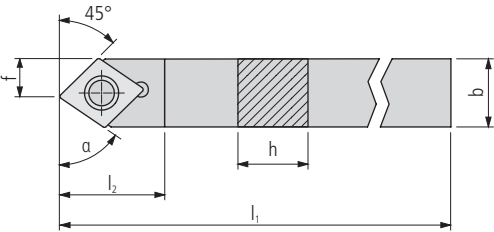


Aussendrehen | Tournage extérieur | OD turning



Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁	l ₂	f				
SCAC... (90°)*												□ 108...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
SCACL 0808 K06 U	□	SCACR 0808 K06 U	□	8	8	125	9	8				CC..0602..
SCACL 1010 M06 U	□	SCACR 1010 M06 U	□	10	10	150	9	10				CC..0602..
SCACL 1212 M09 U	□	SCACR 1212 M09 U	■	12	12	150	13	12				CC..09T3..
SCACL 1616 H09 U	□	SCACR 1616 H09 U	■	16	16	100	13	16				CC..09T3..
SCACL 2020 K12 U	□	SCACR 2020 K12 U	□	20	20	125	17	20				CC..1204..

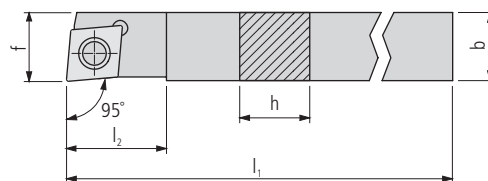
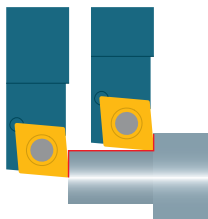
*Für Langdrehautomaten | Pour décolleteuses | For Swiss-Type automatic lathes



Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁	l ₂	f		a		
SCDC... (45°)*												□ 108...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
SCDCL 0808 K06 U	□			8	8	125	13	4		55°		CC..0602..
SCDCL 1010 M06 U	■			10	10	150	13	5		55°		CC..0602..
SCDCL 1212 M09 U	■			12	12	150	18	6		55°		CC..09T3..

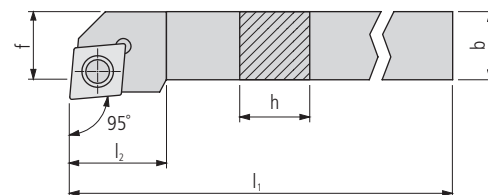
*Für Langdrehautomaten | Pour décolleteuses | For Swiss-Type automatic lathes

Aussendrehen | Tournage extérieur | OD turning

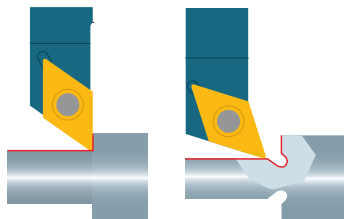


Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁	l ₂	f				
SCLC... (95°)*												□ 108...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
SCLCL 0808 H06 U	■	SCLCR 0808 H06 U	■	8	8	100	10	8				CC..0602..
SCLCL 1010 H06 U	■	SCLCR 1010 H06 U	■	10	10	100	10	10				CC..0602..
SCLCL 1212 H09 U	■	SCLCR 1212 H09 U	■	12	12	100	16	12				CC..09T3..

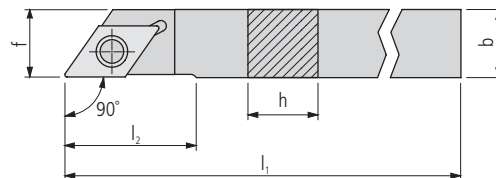
*Für Langdrehautomaten | Pour décolleteuses | For Swiss-Type automatic lathes



Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁	l ₂	f				
SCLC... (95°)												□ 108...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
SCLCL 0808 D06	□	SCLCR 0808 D06	□	8	8	60	10	10				CC..0602..
SCLCL 1010 E06	□	SCLCR 1010 E06	■	10	10	70	10	12				CC..0602..
SCLCL 1212 F09	■	SCLCR 1212 F09	■	12	12	80	16	16				CC..09T3..
SCLCL 1616 H09	■	SCLCR 1616 H09	■	16	16	100	17	20				CC..09T3..
SCLCL 2020 K09	■	SCLCR 2020 K09	■	20	20	125	17	25				CC..09T3..
SCLCL 1616 H12	■	SCLCR 1616 H12	■	16	16	100	20	20				CC..1204..
SCLCL 2020 K12	■	SCLCR 2020 K12	■	20	20	125	20	25				CC..1204..
SCLCL 2525 M12	■	SCLCR 2525 M12	■	25	25	150	20	32				CC..1204..

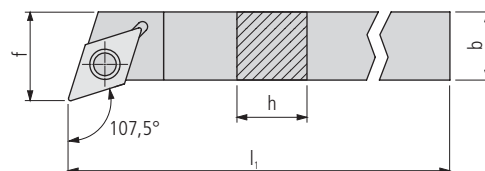


Aussendrehen | Tournage extérieur | OD turning

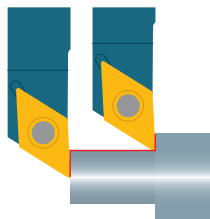


Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁	l ₂	f				
SDAC... (90°)*												□ 112...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
SDACL 0808 K07 U	■	SDACR 0808 K07 U	■	8	8	125	14	8				DC..0702..
SDACL 1010 M07 U	■	SDACR 1010 M07 U	■	10	10	150	14	10				DC..0702..
SDACL 1212 M07 U	■	SDACR 1212 M07 U	■	12	12	150	14	12				DC..0702..
SDACL 1212 M11 U	■	SDACR 1212 M11 U	■	12	12	150	21	12				DC..11T3..
SDACL 1616 K11 U	■	SDACR 1616 K11 U	■	16	16	125	33	16				DC..11T3..

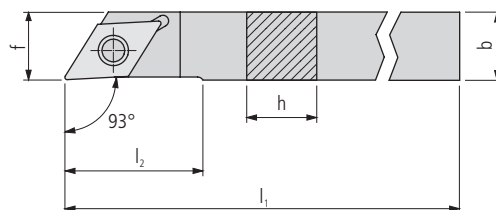
*Für Langdrehautomaten | Pour décolleteuses | For Swiss-Type automatic lathes



Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁		f				
SDHC... (107.5°)												□ 112...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
SDHCL 1010 E07	■	SDHCR 1010 E07	■	10	10	70		12				DC..0702..
SDHCL 1212 F07	■	SDHCR 1212 F07	■	12	12	80		16				DC..0702..
SDHCL 1616 H11	■	SDHCR 1616 H11	■	16	16	100		20				DC..11T3..
SDHCL 2020 K11	■	SDHCR 2020 K11	■	20	20	125		25				DC..11T3..
SDHCL 2525 M11	■	SDHCR 2525 M11	■	25	25	150		32				DC..11T3..



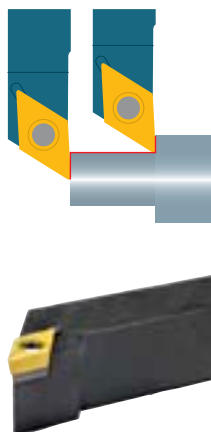
Aussendrehen | Tournage extérieur | OD turning



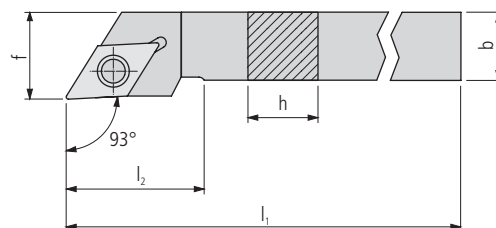
Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁	l ₂	f				
SDJC... (93°)*												□ 112...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
SDJCL 0808 H07 U	■	SDJCR 0808 H07 U	■	8	8	100	13	8				DC..0702..
SDJCL 1010 H07 U	■	SDJCR 1010 H07 U	■	10	10	100	13	10				DC..0702..
SDJCL 1212 H07 U	■	SDJCR 1212 H07 U	■	12	12	100	14.5	12				DC..0702..
SDJCL 1616 K07 U	■	SDJCR 1616 K07 U	■	16	16	125	33	16				DC..0702..
SDJCL 1212 H11 U	■	SDJCR 1212 H11 U	■	12	12	100	22	12				DC..11T3..
SDJCL 1616 K11 U	■	SDJCR 1616 K11 U	■	16	16	125	33	16				DC..11T3..

Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁	l ₂	f				
SDJC... (93°) INCH*												□ 112...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
SDJCL 3/8" H07	□	SDJCR 3/8" H07	■	9.525	9.525	100	22	9.525				DC..0702..
SDJCL 3/8" H11	□	SDJCR 3/8" H11	□	9.525	9.525	100	22	9.525				DC..11T3..
SDJCL 1/2" H07	□	SDJCR 1/2" H07	■	12.7	12.7	100	22	12.7				DC..0702..
SDJCL 1/2" H11	□	SDJCR 1/2" H11	■	12.7	12.7	100	22	12.7				DC..11T3..

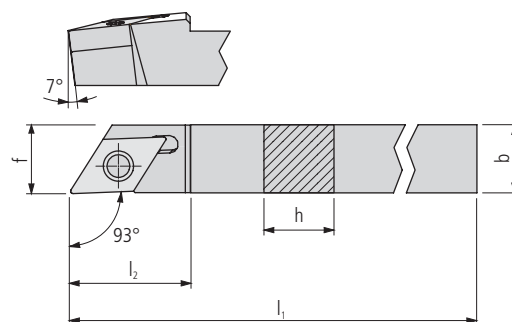
*Für Langdrehautomaten | Pour décolleteuses | For Swiss-Type automatic lathes



Aussendrehen | Tournage extérieur | OD turning

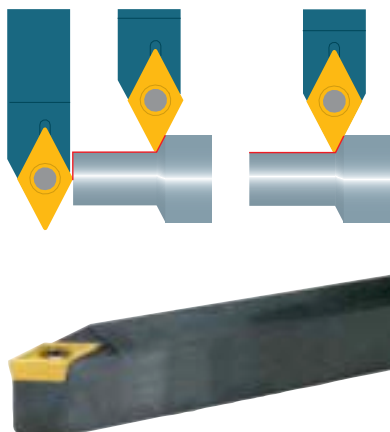


Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁	l ₂	f				
SDJC... (93°)												□ 112...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
SDJCL 0808 D07	□	SDJCR 0808 D07	■	8	8	60	13	10				DC..0702..
SDJCL 1010 E07	■	SDJCR 1010 E07	■	10	10	70	13	12				DC..0702..
SDJCL 1212 F07	■	SDJCR 1212 F07	■	12	12	80	14.5	16				DC..0702..
SDJCL 1616 H11	■	SDJCR 1616 H11	■	16	16	100	20	20				DC..11T3..
SDJCL 2020 K11	■	SDJCR 2020 K11	■	20	20	125	20.5	25				DC..11T3..
SDJCL 2525 M11	■	SDJCR 2525 M11	■	25	25	150	21.5	32				DC..11T3..

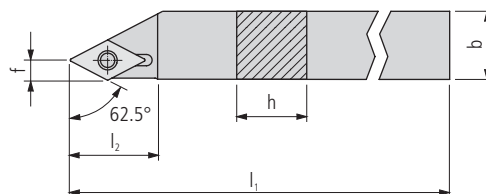


Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁	l ₂	f				
SDJN... (93°)*												□ 117...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
SDJNL 1012 H11	■	SDJNR 1012 H11	■	12	10	100	21.3	12				DN... 11...
SDJNL 1212 H11	■	SDJNR 1212 H11	■	12	12	100	21.3	12				DN... 11...
SDJNL 1616 K11	■	SDJNR 1616 K11	■	16	16	125	21.3	16				DN... 11...
SDJNL 2020 K11	■	SDJNR 2020 K11	■	20	20	125	21.3	20				DN... 11...
SDJNL 2525 M11	■	SDJNR 2525 M11	■	25	25	150	21.3	25				DN... 11...

*Für Langdrehautomaten | Pour décolleteuses | For Swiss-Type automatic lathes

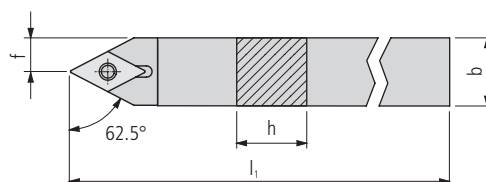


Aussendrehen | Tournage extérieur | OD turning



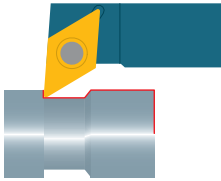
Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁	l ₂	f				
SDNC... (62.5°)*												□ 112...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
SDNCL 1010 H07 U	☐	SDNCR 1010 H07 U	☐	10	10	100	22	3.38				DC..0702..
SDNCL 1212 H07 U	☐	SDNCR 1212 H07 U	☐	12	12	100	22	3.38				DC..0702..
SDNCL 1616 K11 U	☐	SDNCR 1616 K11 U	☐	16	16	125	33	5.37				DC..11T3..
SDNCL 2020 K11 U	☐	SDNCR 2020 K11 U	☐	20	20	125	33	5.37				DC..11T3..

*Für Langdrehautomaten | Pour décolleteuses | For Swiss-Type automatic lathes

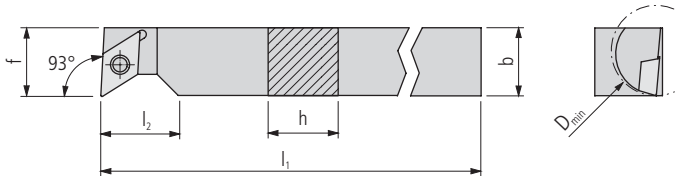


Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁		f				
SDNCN... (62.5°)*												□ 112...
N Neutrale Ausführung Exécution neutre Neutral execution												
SDNCN 0808 K07 U	☒			8	8	125		4				DC..0702..
SDNCN 1010 E07 U	☒			10	10	70		5				DC..0702..
SDNCN 1010 M07 U	☒			10	10	150		5				DC..0702..
SDNCN 1212 F07 U	☒			12	12	80		6				DC..0702..
SDNCN 1212 M07 U	☒			12	12	150		6				DC..0702..
SDNCN 1212 M11 U	☒			12	12	150		6				DC..11T3..
SDNCN 1616 H11 U	☒			16	16	100		8				DC..11T3..
SDNCN 2020 K11 U	☒			20	20	125		10				DC..11T3..
SDNCN 2525 M11 U	☒			25	25	150		12.5				DC..11T3..

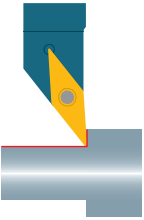
*Für Langdrehautomaten | Pour décolleteuses | For Swiss-Type automatic lathes



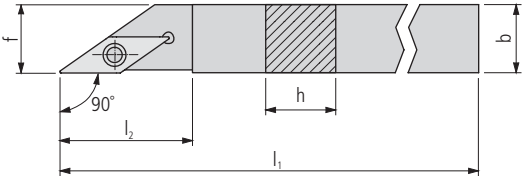
Aussendrehen | Tournage extérieur | OD turning



Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
SDUC... (93°)				b	h	l ₁	l ₂	f	D _{min}			□ 112...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
SDUCL 1212 XH07	■	SDUCR 1212 XH07	■	12	12	100	12	12.2	16			DC..0702..
SDUCL 1616 XK07	■	SDUCR 1616 XK07	■	16	16	125	12	16.2	16			DC..0702..

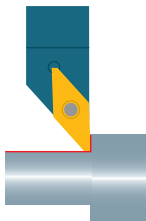


Aussendrehen | Tournage extérieur | OD turning

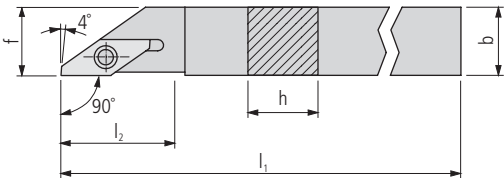


Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁	l ₂	f				
SVAC... (90°)*												□ 118...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
SVACL 0808 H11 U	■	SVACR 0808 H11 U	■	8	8	100	17	8				VC..1103..
SVACL 1010 H11 U	■	SVACR 1010 H11 U	■	10	10	100	22	10				VC..1103..
SVACL 1212 H11 U	■	SVACR 1212 H11 U	■	12	12	100	22	12				VC..1103..

*Für Langdrehautomaten | Pour décolleteuses | For Swiss-Type automatic lathes



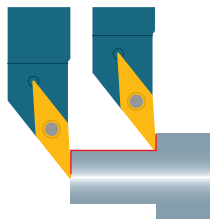
Aussendrehen | Tournage extérieur | OD turning



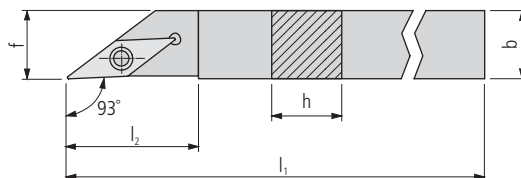
Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁	l ₂	f				
SVAP... (90°)*												□ 122...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
SVAPL 0707 H10	□	SVAPR 0707 H10	□	7	7	100	15	7				VP..1103..
SVAPL 0807 H10	□	SVAPR 0807 H10	□	8	7	100	15	8				VP..1103..
SVAPL 0808 H10	■	SVAPR 0808 H10	■	8	8	100	15	8				VP..1103..
SVAPL 1010 H10	■	SVAPR 1010 H10	■	10	10	100	15	10				VP..1103..
SVAPL 1212 H10	■	SVAPR 1212 H10	■	12	12	100	15	12				VP..1103..

Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁	l ₂	f				
SVAP... (90°) INCH*												□ 122...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
SVAPL 3/8" H10	□	SVAPR 3/8" H10	■	9.525	9.525	100	15	9.525				VP..1103..
SVAPL 1/2" H10	□	SVAPR 1/2" H10	■	12.7	12.7	100	15	12.7				VP..1103..

*Für Langdrehautomaten | Pour décolleteuses | For Swiss-Type automatic lathes



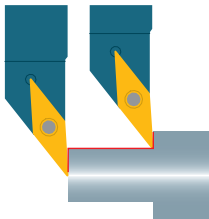
Aussendrehen | Tournage extérieur | OD turning



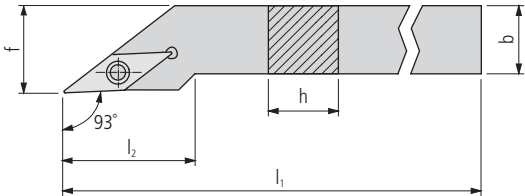
Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁	l ₂	f				
SVJC... (93°)*												□ 118...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
SVJCL 0808 H11 U	■	SVJCR 0808 H11 U	■	8	8	100	17	8				VC..1103..
SVJCL 1010 H11 U	■	SVJCR 1010 H11 U	■	10	10	100	22	10				VC..1103..
SVJCL 1212 H11 U	■	SVJCR 1212 H11 U	■	12	12	100	22	12				VC..1103..
SVJCL 1616 K11 U	■	SVJCR 1616 K11 U	■	16	16	125	33	16				VC..1103..
SVJCL 2020 K11 U	■	SVJCR 2020 K11 U	■	20	20	125	33	20				VC..1103..
SVJCL 1616 K16 U	■	SVJCR 1616 K16 U	■	16	16	125	33	16				VC..1604..

Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁	l ₂	f				
SVJC... (93°) INCH*												□ 118...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
SVJCL 3/8" H11	□	SVJCR 3/8" H11	□	9.525	9.525	100	22	9.525				VC..1103..
SVJCL 1/2" H11	□	SVJCR 1/2" H11	■	12.7	12.7	100	22	12.7				VC..1103..
SVJCL 3/4" K16	□	SVJCR 3/4" K16	□	9.525	9.525	125	33	19.05				VC..1604..

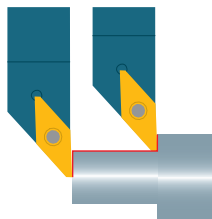
*Für Langdrehautomaten | Pour décolleteuses | For Swiss-Type automatic lathes



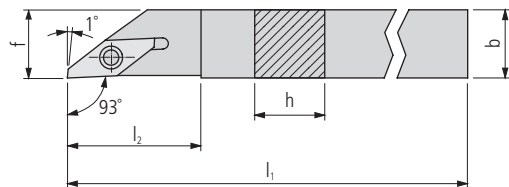
Aussendrehen | Tournage extérieur | OD turning



Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁	l ₂	f				
SVJC... (93°)												□ 118...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
SVJCL 1212 F11	■	SVJCR 1212 F11	■	12	12	80	21.5	16				VC..1103..
SVJCL 1616 H11	■	SVJCR 1616 H11	■	16	16	100	21.5	20				VC..1103..
SVJCL 2020 K11	■	SVJCR 2020 K11	■	20	20	125	23	25				VC..1103..
SVJCL 2525 M11	■	SVJCR 2525 M11	■	25	25	150	25.5	32				VC..1103..
SVJCL 2020 K16	■	SVJCR 2020 K16	■	20	20	125	29.5	25				VC..1604..
SVJCL 2525 M16	■	SVJCR 2525 M16	■	25	25	150	32.5	32				VC..1604..



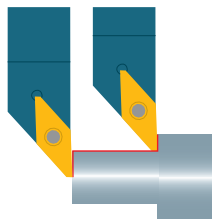
Aussendrehen | Tournage extérieur | OD turning



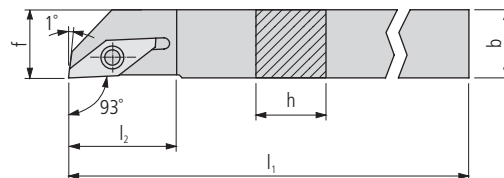
Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁	l ₂	f				
SVJP... (93°)*												□ 122...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
SVJPL 0707 H10	□	SVJPR 0707 H10	□	7	7	100	17	7				VP..1003..
SVJPL 0807 H10	□	SVJPR 0807 H10	□	8	7	100	17	8				VP..1003..
SVJPL 0808 H10	■	SVJPR 0808 H10	■	8	8	100	17	8				VP..1003..
SVJPL 1010 H10	■	SVJPR 1010 H10	■	10	10	100	22	10				VP..1003..
SVJPL 1212 H10	■	SVJPR 1212 H10	■	12	12	100	22	12				VP..1003..
SVJPL 1616 K10	■	SVJPR 1616 K10	■	16	16	125	33	16				VP..1003..
SVJPL 2020 K10	■	SVJPR 2020 K10	■	20	20	125	50	20				VP..1003..

Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁	l ₂	f				
SVJP... (93°) INCH*												□ 122...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
SVJPL 3/8" H10	□	SVJPR 3/8" H10	■	9.525	9.525	100	22	9.525				VP..1003..
SVJPL 1/2" H10	□	SVJPR 1/2" H10	■	12.7	12.7	100	22	12.7				VP..1003..

*Für Langdrehautomaten | Pour décolleteuses | For Swiss-Type automatic lathes



Aussendrehen | Tournage extérieur | OD turning
Verstärkte Ausführung | Version renforcée | Strengthen type

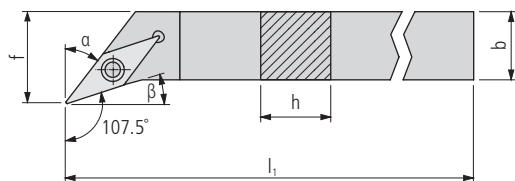
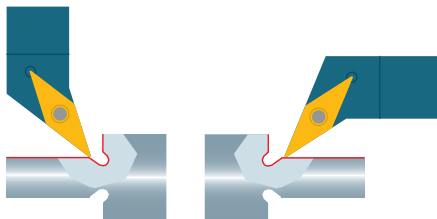


Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁	l ₂	f				
SVJP...V (93°)*												□ 122...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
SVJPL 1010 H10 V	□	SVJPR 1010 H10 V	□	10	10	100	22	10				VP..1003..
SVJPL 1212 H10 V	■	SVJPR 1212 H10 V	■	12	12	100	22	12				VP..1003..
SVJPL 1616 K10 V	■	SVJPR 1616 K10 V	■	16	16	125	33	16				VP..1003..
SVJPL 2020 K10 V	□	SVJPR 2020 K10 V	□	20	20	125	50	20				VP..1003..

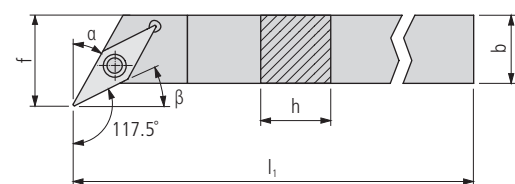
Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁	l ₂	f				
SVJP...V (93°) INCH*												□ 122...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
SVJPL 3/8" H10 V	□	SVJPR 3/8" H10 V	□	9.525	9.525	100	22	9.525				VP..1003..
SVJPL 1/2" H10 V	□	SVJPR 1/2" H10 V	□	12.7	12.7	100	22	12.7				VP..1003..

*Für Langdrehautomaten | Pour décolleteuses | For Swiss-Type automatic lathes

Aussendrehen | Tournage extérieur | OD turning



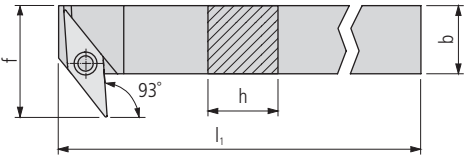
Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁		f		a	β	
SVHC... (107.5°)												□ 118...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
SVHCL 1212 F11	■	SVHCR 1212 F11	■	12	12	80		16		37.5°	17.5°	VC..1103..
SVHCL 1616 H11	■	SVHCR 1616 H11	■	16	16	100		20		37.5°	17.5°	VC..1103..
SVHCL 2020 K11	■	SVHCR 2020 K11	■	20	20	125		25		37.5°	17.5°	VC..1103..
SVHCL 2525 M11	■	SVHCR 2525 M11	■	25	25	150		32		37.5°	17.5°	VC..1103..
SVHCL 2020 K16	■	SVHCR 2020 K16	■	20	20	125		25		37.5°	17.5°	VC..1604..
SVHCL 2525 M16	■	SVHCR 2525 M16	■	25	25	150		32		37.5°	17.5°	VC..1604..



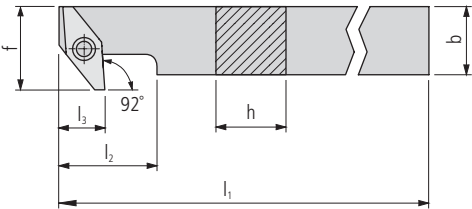
Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁		f		a	β	
SVOC... (117.5°)												□ 118...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
SVOCL 1212 H11	■	SVOCR 1212 H11	■	12	12	100		16		27.5°	27.5°	VC..1103..
SVOCL 1616 K11	■	SVOCR 1616 K11	■	16	16	125		20		27.5°	27.5°	VC..1103..
SVOCL 2020 K11	□	SVOCR 2020 K11	■	20	20	125		24		27.5°	27.5°	VC..1103..



Aussendrehen | Tournage extérieur | OD turning

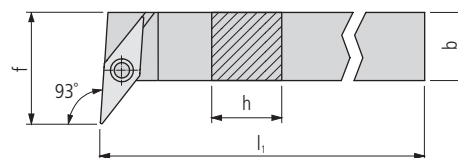


Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁		f				
SVQC... (93°)												□ 118...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
SVQCL 1212 H11	□	SVQCR 1212 H11	■	12	12	100		20				VC..1103..
SVQCL 1616 K11	□	SVQCR 1616 K11	■	16	16	125		24				VC..1103..

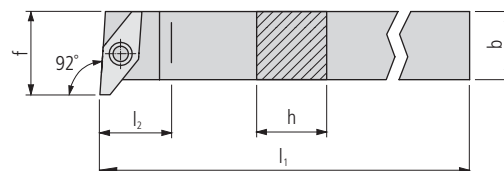


Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁	l ₂	f			l ₃	
SVQP... (92°)												□ 122...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
SVQPL 1212 XH10	■	SVQPR 1212 XH10	■	12	12	100	12	15.7			7.5	VP..1003..
SVQPL 1616 XK10	■	SVQPR 1616 XK10	■	16	16	125	12	15.7			7.6	VP..1003..

Aussendrehen | Tournage extérieur | OD turning

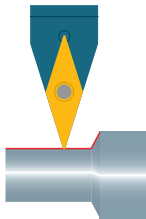


Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁		f				
SVUC... (93°)												□ 118...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
SVUCL 1212 H11	■	SVUCR 1212 H11	■	12	12	100		20				VC..1103..
SVUCL 1616 K11	■	SVUCR 1616 K11	■	16	16	125		24				VC..1103..

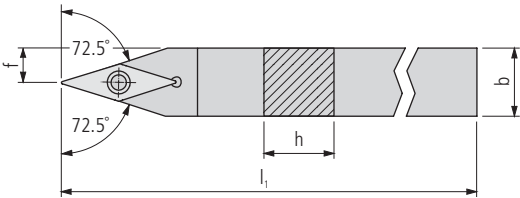


Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁		f				
SVUP... (92°)												□ 122...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
SVUPL 1212 XH10	■	SVUPR 1212 XH10	■	12	12	100		15.7				VP..1003..*
SVUPL 1616 XK10	■	SVUPR 1616 XK10	■	16	16	125		15.7				VP..1003..*

*** Achtung | Attention | Attention**
Rechter Halter benötigt linke Schneide!
Outil à droite avec plaquette à gauche!
Right hand holder needs left hand insert!

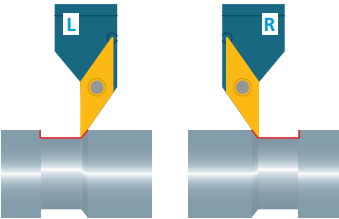


Aussendrehen | Tournage extérieur | OD turning

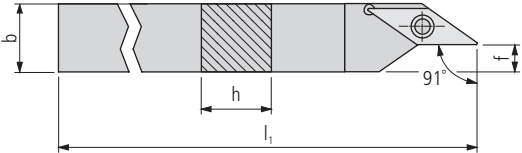


Bezeichnung Désignation Designation		Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
		b	h	l ₁		f				
SVVCN... (72.5°)*										□ 118...
N Neutrale Ausführung Exécution neutre Neutral execution										
SVVCN 0808 H11 U	■	8	8	100		4				VC..1103..
SVVCN 1010 H11 U	■	10	10	100		5				VC..1103..
SVVCN 1212 F11 U	■	12	12	80		6				VC..1103..
SVVCN 1212 H11 U	■	12	12	100		6				VC..1103..
SVVCN 1616 H11 U	■	16	16	100		8				VC..1103..
SVVCN 2020 K11 U	■	20	20	125		10				VC..1103..
SVVCN 2525 M11 U	■	25	25	150		12.5				VC..1103..
SVVCN 2020 K16 U	■	20	20	125		10				VC..1604..
SVVCN 2525 M16 U	■	25	25	150		12.5				VC..1604..

*Für Langdrehautomaten | Pour décolleteuses | For Swiss-Type automatic lathes

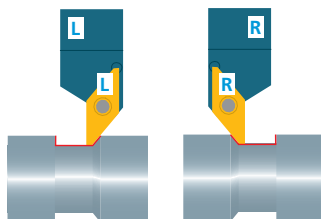


Aussendrehen | Tournage extérieur | OD turning

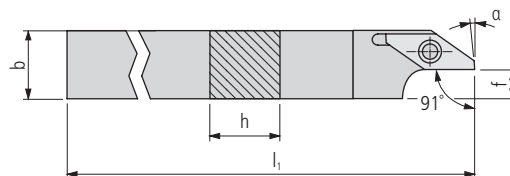


Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁		f				
SVXC... (91°)*												□ 118...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
SVXCL 1010 H11 U	■	SVXCR 1010 H11 U	■	10	10	100		3.4				VC..1103..
SVXCL 1212 H11 U	■	SVXCR 1212 H11 U	■	12	12	100		5.4				VC..1103..
SVXCL 1616 K11 U	■	SVXCR 1616 K11 U	■	16	16	125		8.9				VC..1103..
SVXCL 2020 K16 U	■	SVXCR 2020 K16 U	■	20	20	125		10.4				VC..1604..

*Für Langdrehautomaten | Pour décolleteuses | For Swiss-Type automatic lathes



Aussendrehen | Tournage extérieur | OD turning

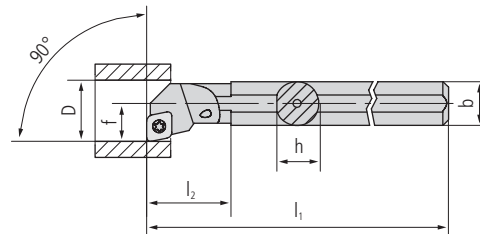


Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions							Schneiden Plaquettes Inserts
				b	h	l ₁		f		α	
SVXP... (91°)*											□ 122...
L	Linke Ausführung Exécution gauche Left execution			R	Rechte Ausführung Exécution droite Right execution						
SVXPL 0808 H10	■	SVXPR 0808 H10	■	8	8	100		8		3°	VP..1003..
SVXPL 1010 H10	■	SVXPR 1010 H10	■	10	10	100		10		3°	VP..1003..
SVXPL 1212 H10	■	SVXPR 1212 H10	■	12	12	100		12		3°	VP..1003..
SVXPL 1616 K10	■	SVXPR 1616 K10	■	16	16	125		16		3°	VP..1003..
SVXPL 2020 K10	■	SVXPR 2020 K10	■	20	20	125		20		3°	VP..1003..

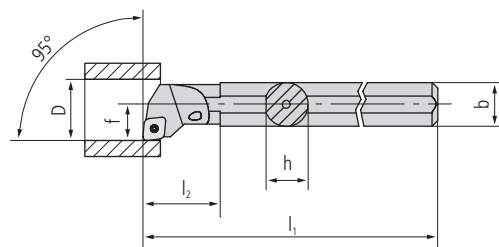
Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions							Schneiden Plaquettes Inserts
				b	h	l ₁		f		α	
SVXP... (91°) INCH*											□ 122...
L	Linke Ausführung Exécution gauche Left execution			R	Rechte Ausführung Exécution droite Right execution						
SVXPL 3/8" H10	□	SVXPR 3/8" H10	□	9.525	9.525	100		10		3°	VP..1003..
SVXPL 1/2" H10	□	SVXPR 1/2" H10	□	12.7	12.7	100		12		3°	VP..1003..

*Für Langdrehautomaten | Pour décolleteuses | For Swiss-Type automatic lathes

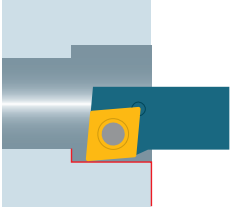
Innendrehen | Tournage intérieur | ID turning



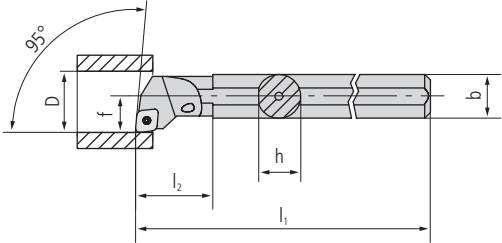
Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions							Schneiden Plaquettes Inserts	
				b	h	l ₁	l ₂	f	D			
SCFC... (90°)											□ 108...	
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
A08F SCFCL 06	□	A08F SCFCR 06	■	8	7.6	80	17	5	11		CC..0602..	
A10H SCFCL 06	□	A10H SCFCR 06	■	10	9.5	100	19	7	13		CC..0602..	
A12K SCFCL 06	□	A12K SCFCR 06	■	12	11.5	125	22	9	16		CC..0602..	



Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions							Schneiden Plaquettes Inserts	
				b	h	l ₁	l ₂	f	D			
SCLC... (95°)											□ 108...	
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
A08F SCLCL 06	■	A08F SCLCR 06	■	8	7.6	80	17	5	11		CC..0602..	
A10H SCLCL 06	■	A10H SCLCR 06	■	10	9.5	100	19	7	13		CC..0602..	
A12K SCLCL 06	■	A12K SCLCR 06	■	12	11.5	125	22	9	16		CC..0602..	
A16M SCLCL 09	■	A16M SCLCR 09	■	16	15	150	29	11	20		CC..09T3..	
A20Q SCLCL 09	■	A20Q SCLCR 09	■	20	18.5	180	32	13	25		CC..09T3..	
A25R SCLCL 09	□	A25R SCLCR 09	■	25	23	200	36	17	32		CC..09T3..	



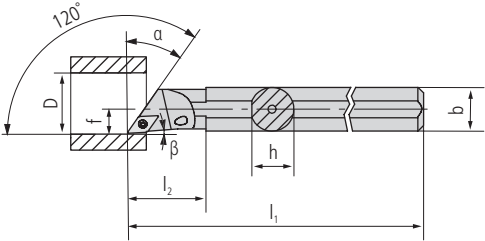
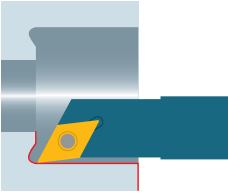
Innendrehen | Tournage intérieur | ID turning



Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions										Schneiden Plaquettes Inserts
				b	h	l ₁	l ₂	f	D					
SCLC... (95°)*														□ 108...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution												
E08H SCLCL 06	■	E08H SCLCR 06	■	8	7.6	100	—	6	11					CC..0602..
E10K SCLCL 06	■	E10K SCLCR 06	■	10	9	125	10	7	13					CC..0602..
E12Q SCLCL 06	■	E12Q SCLCR 06	■	12	11.5	180	10	9	16					CC..0602..
E16R SCLCL 09	□	E16R SCLCR 09	■	16	15	200	16	11	20					CC..09T3..
E20S SCLCL 09	□	E20S SCLCR 09	□	20	18.5	250	16	13	25					CC..09T3..
E25T SCLCL 09	□	E25T SCLCR 09	□	25	23	300	16	17	32					CC..09T3..

* Mit Vollhartmetallschaft | Avec queue en carbure | With carbide shank

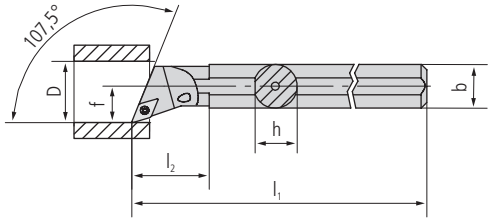
Innendrehen | Tournage intérieur | ID turning



Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁	l ₂	f	D	a	β	
SDOC... (120°)												□ 112...
L Linke Ausführung Exécution gauche Left execution R Rechte Ausführung Exécution droite Right execution												
A12K SDOCL 07	☐	A12K SDOCR 07	☒	12	11.5	125	21	7	14	30°	5°	DC..0702..

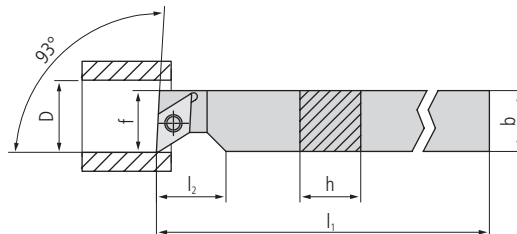
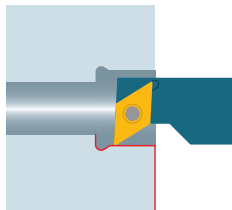


Innendrehen | Tournage intérieur | ID turning



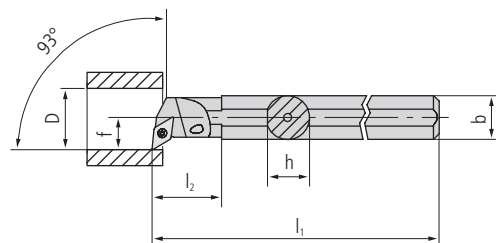
Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁	l ₂	f	D			
SDQC... (107.5°)												□ 112...
L	Linke Ausführung Exécution gauche Left execution			R	Rechte Ausführung Exécution droite Right execution							
A12K SDQCL 07	■	A12K SDQCR 07	■	12	11.5	125	22	9	16			DC..0702..
A16M SDQCL 07	■	A16M SDQCR 07	■	16	15	150	29	11	20			DC..0702..
A20Q SDQCL 07	■	A20Q SDQCR 07	■	20	18.5	180	32	13	25			DC..0702..
A25R SDQCL 11	■	A25R SDQCR 11	■	25	23	200	36	17	32			DC..11T3..

Innendrehen | Tournage intérieur | ID turning

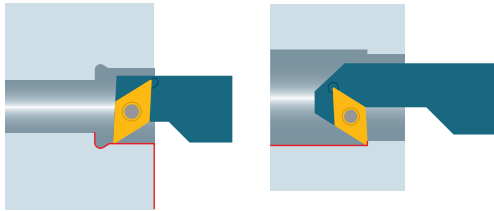


Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions							Schneiden Plaquettes Inserts
				b	h	l ₁	l ₂	f	D		
SDUC... (93°)*											□ 112...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution									
SDUCL 1212 XH07	■	SDUCR 1212 XH07	■	12	12	100	12	12.2	16		DC..0702..
SDUCL 1616 XK07	■	SDUCR 1616 XK07	■	16	16	125	12	16.2	16		DC..0702..

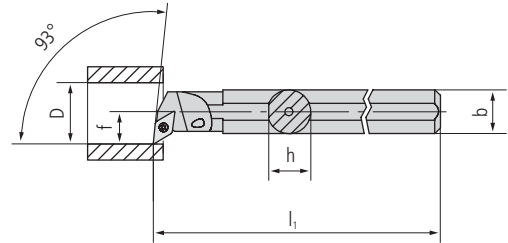
*Für Langdrehautomaten | Pour décolleteuses | For Swiss-Type automatic lathes



Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions							Schneiden Plaquettes Inserts
				b	h	l ₁	l ₂	f	D		
SDUC... (93°)											□ 112...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution									
A10H SDUCL 07	■	A10H SDUCR 07	■	10	9	100	—	7	14		DC..0702..
A12K SDUCL 07	■	A12K SDUCR 07	■	12	11.5	125	22	9	16		DC..0702..
A16M SDUCL 07	■	A16M SDUCR 07	■	16	15	150	29	11	20		DC..0702..
A20Q SDUCL 07	■	A20Q SDUCR 07	■	20	18.5	180	32	13	25		DC..0702..
A20Q SDUCL 11	□	A20Q SDUCR 11	■	20	18.5	180	32	13	25		DC..11T3..
A25R SDUCL 11	■	A25R SDUCR 11	■	25	23	200	36	17	32		DC..11T3..

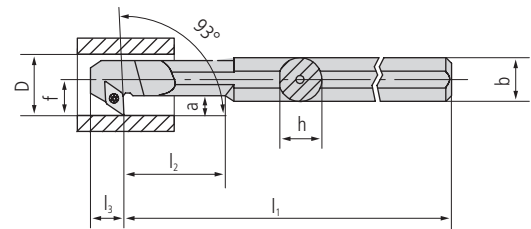


Innendrehen | Tournage intérieur | ID turning



Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions							Schneiden Plaquettes Inserts
				b	h	l ₁		f	D		
SDUC... (93°)*											□ 112...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution									
E12Q SDUCL 07	■	E12Q SDUCR 07	■	12	11.5	180		9	16		DC..0702..
E16R SDUCL 07	■	E16R SDUCR 07	■	16	15	200		11	20		DC..0702..
E20S SDUCL 11	□	E20S SDUCR 11	■	20	18.5	250		13	25		DC..1103..
E25T SDUCL 11	□	E25T SDUCR 11	□	25	23	300		17	32		DC..1103..

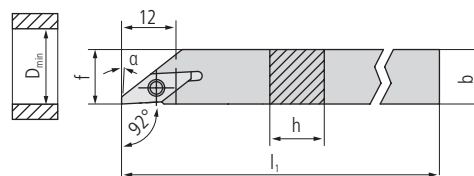
* Mit Vollhartmetallschaft | Avec queue en carbure | With carbide shank



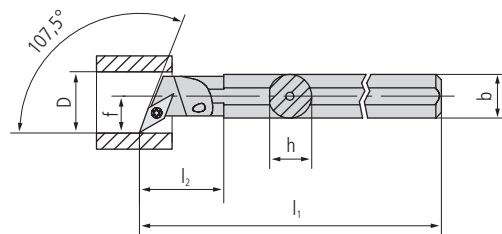
Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁	l ₂	f	D	l ₃	a	
SDXC... (93°)												□ 112...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
A12K SDXCL 07	■	A12K SDXCR 07	■	12	11.5	125	24	9	16	12	4	DC..0702..
A16M SDXCL 07	□	A16M SDXCR 07	■	16	15	150	36	11	20	12	4	DC..0702..
A20Q SDXCL 11	□	A20Q SDXCR 11	■	20	18.5	180	40	13	25	16.5	6.2	DC..11T3..
A25R SDXCL 11	□	A25R SDXCR 11	□	25	23	200	50	17	32	16.8	9.2	DC..11T3..



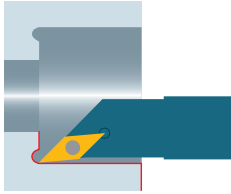
Innendrehen | Tournage intérieur | ID turning



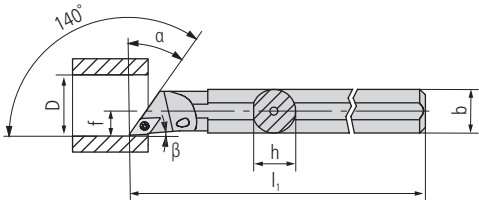
Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions							Schneiden Plaquettes Inserts
				b	h	l ₁		f	D _{min}	a	
SVJP... (92°)											□ 122...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution									
SVJPL 1212 XH10	■	SVJPR 1212 XH10	■	12	12	100		12.2	16	2°	VP..1003..
SVJPL 1616 XK10	■	SVJPR 1616 XK10	■	16	16	125		16.2	16	2°	VP..1003..



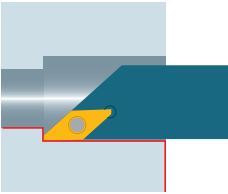
Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions							Schneiden Plaquettes Inserts
				b	h	l ₁	l ₂	f	D		
SVQC... (107.5°)											□ 118...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution									
A16M SVQCL 11	■	A16M SVQCR 11	■	16	15	150	29	11	20		VC..1003..
A20Q SVQCL 11	■	A20Q SVQCR 11	■	20	18.5	180	32	13	25		VC..1003..
A25R SVQCL 11	■	A25R SVQCR 11	■	25	23	200	36	17	32		VC..1003..



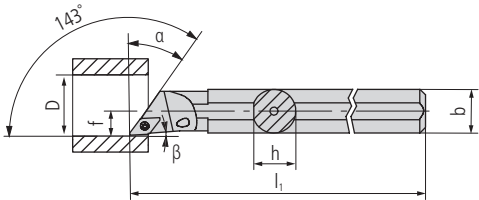
Innendrehen | Tournage intérieur | ID turning



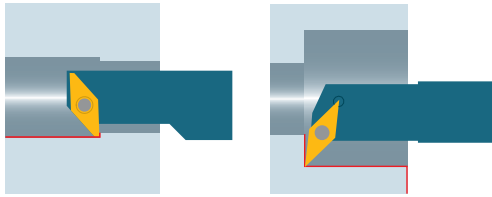
Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁		f	D	α	β	
SVOC... (140°)												□ 118...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
A12K SVOCL 11	☐	A12K SVOCR 11	☒	12	11.5	125		7	17	50°	5°	VC..11..
A16M SVOCL 11	☐	A16M SVOCR 11	☒	16	15.5	150		9	20	50°	5°	VC..11..



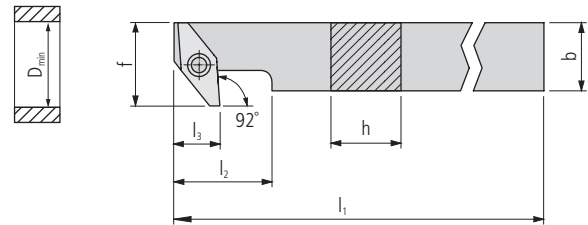
Innendrehen | Tournage intérieur | ID turning



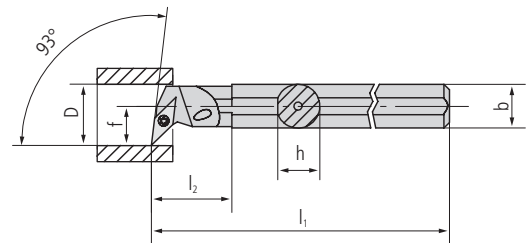
Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁		f	D	α	β	
SVOP... (143°)												□ 122...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
A16M SVOPL 10	☐	A16M SVOPR 10	☒	16	15.3	150		8.3	20	53°	2°	VP..1003..



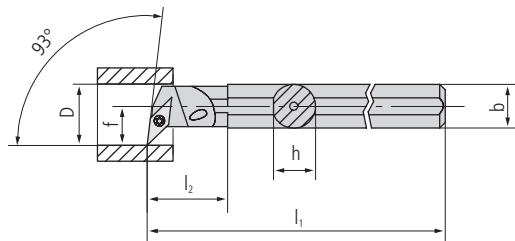
Innendrehen | Tournage intérieur | ID turning



Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions							Schneiden Plaquettes Inserts
				b	h	l ₁	l ₂	f	D _{min}	l ₃	
SVQP... (92°)											□ 122...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution									
SVQPL 1212 XH10	■	SVQPR 1212 XH10	■	12	12	100	12	15.7	16	7.5	VP..1003..
SVQPL 1616 XK10	■	SVQPR 1616 XK10	■	16	16	125	12	15.7	16	7.6	VP..1003..

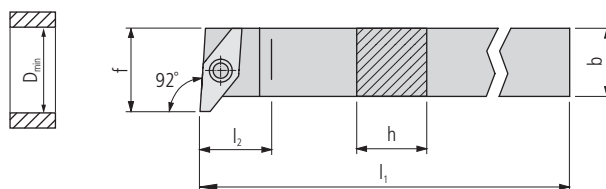


Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions							Schneiden Plaquettes Inserts
				b	h	l ₁	l ₂	f	D		
SVUC... (93°)											□ 118...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution									
A16M SVUCL 11	■	A16M SVUCR 11	■	16	15	150	29	11	20		VC..1003..
A20Q SVUCL 11	■	A20Q SVUCR 11	■	20	18.5	180	32	13	25		VC..1003..
A25R SVUCL 11	□	A25R SVUCR 11	■	25	23	200	36	17	32		VC..1003..



Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions							Schneiden Plaquettes Inserts	
				b	h	l ₁	l ₂	f	D			
SVUC... (93°)*											□ 118...	
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
E16R SVUCL 11	■	E16R SVUCR 11	■	16	15	200	16.5	11	20		VC..1003..	
E20S SVUCL 11	■	E20S SVUCR 11	■	20	18.5	250	20.5	13	25		VC..1003..	
E25T SVUCL 11	■	E25T SVUCR 11	■	25	23	300	25.5	17	32		VC..1003..	

* Mit Vollhartmetallschaft | Avec queue en carbure | With carbide shank



Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions							Schneiden Plaquettes Inserts	
				b	h	l ₁	l ₂	f	D _{min}			
SVUP... (92°)											□ 122...	
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
SVUPL 1212 XH10	■	SVUPR 1212 XH10	■	12	12	100	12	15.7	16		VP..1003..*	
SVUPL 1616 XK10	■	SVUPR 1616 XK10	■	16	16	125	12	15.7	16		VP..1003..*	

*** Achtung | Attention | Attention**
Rechter Halter benötigt linke Schneide!
Outil à droite avec plaquette à gauche!
Right hand holder needs left hand insert!

SC... (Klemmhalter | Porte-outils | Tool holders)

Abbildung Illustration Illustration	Bezeichnung Désignation Designation	Dimensionen Dimensions Dimensions	Beschreibung Description Description	Halter Porte-outil Holder
	MSP 25060 T08	M2.5 × 6 T08	Torxschraube Vis torx Torx screw	SC... 06
	MSP 35110 T15	M3.5 × 11 T15		SC... 09
	MSP 45120 T15	M4.5 × 12 T15		SC... 12
	MSP TX08	T08	Torxschlüssel Tournevis torx Torx screwdriver	SC... 06
	MSP TX15	T15		SC... 09/SC... 12
	MSP TX08 D	T08 (1.2 Nm)	Drehmoment-Torxschlüssel Tournevis à serrage contrôlé Torquedriver	SC... 06
	MSP TX15 D	T15 (3 Nm)		SC... 09/SC... 12

... SC... (Bohrstangen | Barre d'alésage | Boring bar)

Abbildung Illustration Illustration	Bezeichnung Désignation Designation	Dimensionen Dimensions Dimensions	Beschreibung Description Description	Halter Porte-outil Holder
	MSP 25050 T08	M2.5 × 5 T08	Torxschraube Vis torx Torx screw	A.../E... SC... 06
	MSP 35072 T15	M3.5 × 7.2 T15		A16./E16. SC... 09
	MSP 35086 T15	M3.5 × 8.6 T15		A20./E20. SC... 09/
	MSP 35110 T15	M3.5 × 11 T15		A25. SC... 09
	MSP TX08	T08	Torxschlüssel Tournevis torx Torx screwdriver	A.../E... SC... 06
	MSP TX15	T15		A.../E... SC... 09
	MSP TX08 D	T08 (1.2 Nm)	Drehmoment-Torxschlüssel Tournevis à serrage contrôlé Torquedriver	A.../E... SC... 06
	MSP TX15 D	T15 (3 Nm)		A.../E... SC... 09

SD... (Klemmhalter | Porte-outils | Tool holders)

Abbildung Illustration Illustration	Bezeichnung Désignation Designation	Dimensionen Dimensions Dimensions	Beschreibung Description Description	Halter Porte-outil Holder
	MSP 25060 T08	M2.5 × 6 T08	Torxschraube Vis torx Torx screw	SD... 07
	MSP 40110 TP15	M4 × 11 TP15	Torxschraube Vis torx Torx screw (TORX PLUS®)	SDJN. 11
	MSP 35110 T15	M3.5 × 11 T15	Torxschraube Vis torx Torx screw	SD... 11
	MSP TX08	T08	Torxschlüssel Tournevis torx Torx screwdriver	SD... 07
	MSP TX15	T15	Torxschlüssel Tournevis torx Torx screwdriver	SD... 11
	MSP TXP15	TP15	Torxschlüssel Tournevis torx Torx screwdriver (TORX PLUS®)	SDJN. 11
	MSP TX08 D	T08 (1.2 Nm)	Drehmoment-Torxschlüssel Tournevis à serrage contrôlé Torquedriver	SD... 07
	MSP TX15 D	T15 (3 Nm)		SD... 11

... SD... (Bohrstangen | Barre d'alésage | Boring bar)

Abbildung Illustration Illustration	Bezeichnung Désignation Designation	Dimensionen Dimensions Dimensions	Beschreibung Description Description	Halter Porte-outil Holder
	MSP 25060 T08	M2.5 × 6 T08	Torxschraube Vis torx Torx screw	A.../E... SD... 07
	MSP 35086 T15	M3.5 × 8.6 T15		A20./E20. SD... 11/
	MSP 35110 T15	M3.5 × 11 T15		A25. SD... 11
	MSP TX08	T08	Torxschlüssel Tournevis torx Torx screwdriver	A.../E... SD... 07
	MSP TX15	T15		A.../E... SD... 11
	MSP TX08 D	T08 (1.2 Nm)	Drehmoment-Torxschlüssel Tournevis à serrage contrôlé Torquedriver	A.../E... SD... 07
	MSP TX15 D	T15 (3 Nm)		A.../E... SD... 11

SV... (Klemmhalter | Porte-outils | Tool holders)

Abbildung Illustration	Bezeichnung Désignation Designation	Dimensionen Dimensions Dimensions	Beschreibung Description Description	Halter Porte-outil Holder
	MSP 25060 T08	M2.5 × 6 T08	Torxschraube Vis torx Torx scrow	SV... 10/SV... 11
	MSP 35110 T15	M3.5 × 11 T15		SV... 16
	MSP TX08	T08	Torxschlüssel Tournevis torx Torx screwdriver	SV... 10/SV... 11
	MSP TX15	T15		SV... 16
	MSP TX08 D	T08 (1.2 Nm)	Drehmoment-Torxschlüssel Tournevis à serrage contrôlé Torquedriver	SV... 10/SV... 11
	MSP TX15 D	T15 (3 Nm)		SV... 16

... SV... (Bohrstangen | Barre d'alésage | Boring bar)

Abbildung Illustration	Bezeichnung Désignation Designation	Dimensionen Dimensions Dimensions	Beschreibung Description Description	Halter Porte-outil Holder
	MSP 25060 T08	M2.5 × 6 T08	Torxschraube Vis torx Torx scrow	A.../E... SV... 10
	MSP 35110 T15	M3.5 × 11 T15		A.../E... SV... 11
	MSP TX08	T08	Torxschlüssel Tournevis torx Torx screwdriver	A.../E... SV... 10
	MSP TX15	T15		A.../E... SV... 11
	MSP TX08 D	T08 (1.2 Nm)	Drehmoment-Torxschlüssel Tournevis à serrage contrôlé Torquedriver	A.../E... SV... 10
	MSP TX15 D	T15 (3 Nm)		A.../E... SV... 11

Sorte Nuance Grade	Normbezeichnung Norme Norm	Zähigkeit des Schneidstoffs Tenacité du matériau de coupe Toughness of cutting grades																Werkstoffe (Kategorie) Matières (Catégorie) Materials (Category)													
		Härte (HB) Dureté (HB) Hardness value (HB)																125 – 300	180 – 250	200 – 350											
																		Stahl unlegiert Acier non allié Steel non-alloyed (I)	Stahl niedrig legiert Acier faibl. allié Steel low alloyed (II)	Stahl hochlegiert Acier fortem. allié Steel high alloyed (III)	Titan Titane Titanium (IV)	Rostfreier Stahl Acier inoxydable Stainless steel (V)	Rostfreier Stahl Acier inoxydable Stainless steel (VI)	Aluminium Aluminium Aluminium (VII)	Messing Laiton Brass (VIII)						
		01	05	10	15	20	25	30	35	40	45	50																			
Hartmetall Carbure Carbide																															
UHM 10	K 10/M 10																														
UHM 10 SX	K 10/M 10																														
UHM 10 HX	K 10/M 10																														
UHM 20 HPX	P 20–P 40/M 20–M 40																														
UHM 20 MZ	P 25																														
UHM 30	K 30/M 20																														
UHM 30 SX	K 30/M 20																														
UHM 30 MZ	P 35/M 35																														
UHM 30 HX	K 30/M 20																														
Cermet Cermet Cermet																															
UCM 10	P 15/K 10/M 10																														
UCM 10 HX	P 15/K 10/M 10																														
UCM 10 MZ	P 10/K 05/M 10																														
Diamant Diamant Diamond																															
UCVD 08																															
UPCD 15																															
UPCD 20																															

Werkstoffe | Matières | Materials

	Stahl unlegiert Acier non allié Steel unalloyed			Stahl niedriglegiert Acier faibl. allié Steel low alloyed			Stahl hochlegiert Acier fortem. allié Steel high alloyed			Titan Titane Titanium		
Härte (HB) Dureté (HB) Hardness value (HB)	125–300			180–250			200–350			–		
Kategorie Catégorie Category	I			II			III			IV		
Bearbeitung Usinage Machining method	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼

Schnittgeschwindigkeiten (v_c) | Vitesses de coupe (v_c) | Cutting speeds (v_c)

	v _c (m/min)			v _c (m/min)			v _c (m/min)			v _c (m/min)		
Schneidstoff Hartmetall Matériaux de coupe carbure Cutting material carbide												
UHM 10	40–110	60–120	60–140	60–100	60–120	60–130	40–90	60–110	60–120	40–60	50–70	60–80
UHM 10 SX	60–160	60–220	60–240	60–140	60–180	60–220	50–130	60–160	60–200	–	–	–
UHM 10 HX	60–180	60–220	60–260	60–170	60–200	60–240	50–160	60–180	60–220	40–120	50–130	50–150
UHM 20 HPX	150–200	180–220	200–260	80–150	100–180	160–220	60–90	150–200	150–200	150–200	150–200	150–200
UHM 20 MZ	130–180	160–220	180–260	100–160	110–180	130–220	70–150	110–160	130–190	–	–	–
UHM 30	30–70	50–80	50–100	30–60	40–80	40–90	30–50	30–70	30–80	40–50	25–60	30–70
UHM 30 SX	50–120	50–180	50–200	50–100	50–140	50–180	40–90	50–120	50–160	–	–	–
UHM 30 MZ	120–160	150–200	170–240	90–140	100–160	120–200	60–130	90–140	110–160	–	–	–
UHM 30 HX	50–140	50–180	50–220	50–130	50–160	50–200	40–120	50–140	50–180	30–90	40–100	40–120
Schneidstoff Cermet Matériaux de coupe cermet Cutting material cermet												
UCM 10	–	180–300	220–350	–	140–250	180–300	–	140–180	160–200	–	–	–
UCM 10 HX	–	250–350	300–450	–	200–300	220–380	–	240–300	260–350	–	–	–
UCM 10 MZ	–	300–400	350–500	–	250–350	240–300	–	250–320	270–350	–	–	–
Schneidstoff Diamant Matériaux de coupe diamant Cutting material diamond												
UCVD 08	–	–	–	–	–	–	–	–	–	–	–	–
UPCD 15	–	–	–	–	–	–	–	–	–	–	–	–
UPCD 20	–	–	–	–	–	–	–	–	–	–	–	–

Vorschübe (f) und Schnitttiefen (a_p) | Avances (f) et profondeurs de passes (a_p) | Feed (f) and depths of cut (a_p) □ 97...

Werkstoffe | Matières | Materials

	Rostfreier Stahl Acier inoxydable Stainless steel			Rostfreier Stahl Acier inoxydable Stainless steel			Aluminium Aluminium Aluminium			Messing Laiton Brass		
Härte (HB) Dureté (HB) Hardness value (HB)	180–220			220–330			60–130			–		
Kategorie Catégorie Category	V			VI			VII			VIII		
Bearbeitung Usinage Machining method	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼

Schnittgeschwindigkeiten (v_c) | Vitesses de coupe (v_c) | Cutting speeds (v_c)

	v _c (m/min)			v _c (m/min)			v _c (m/min)			v _c (m/min)		
Schneidstoff Hartmetall Matériaux de coupe carbure Cutting material carbide												
UHM 10	40–100	40–110	40–120	30–70	30–80	30–80	100–1500	120–2000	160–2500	80–300	100–400	120–500
UHM 10 SX	40–130	50–160	50–200	30–90	40–100	40–120	120–1800	160–2500	200–3000	100–360	100–550	100–600
UHM 10 HX	50–140	50–180	50–220	40–100	50–110	50–130	140–2500	160–3000	200–3000	100–450	100–600	100–750
UHM 20 HPX	90–150	110–180	160–200	70–90	90–120	110–150	–	–	–	–	–	–
UHM 20 MZ	90–150	110–160	130–180	50–80	30–50	40–70	–	–	–	–	–	–
UHM 30	30–60	30–70	30–80	20–30	20–40	20–40	50–1000	60–1200	80–1500	40–100	50–140	50–160
UHM 30 SX	30–90	40–120	40–160	20–50	30–60	30–80	60–1200	80–2000	100–3000	50–120	50–180	50–200
UHM 30 MZ	80–130	100–140	110–160	40–80	50–90	90–110	–	–	–	–	–	–
UHM 30 HX	40–100	40–140	40–180	30–60	40–70	40–90	70–1500	80–2000	100–3000	50–150	50–200	50–250
Schneidstoff Cermet Matériaux de coupe cermet Cutting material cermet												
UCM 10	–	140–180	150–220	–	70–90	70–110	–	–	–	–	–	–
UCM 10 HX	–	170–230	220–280	–	80–110	110–140	–	–	–	–	–	–
UCM 10 MZ	–	180–250	250–320	–	90–120	120–160	–	–	–	–	–	–
Schneidstoff Diamant Matériaux de coupe diamant Cutting material diamond												
UCVD 08	–	–	–	–	–	–	–	300–2000	300–3000	–	250–1000	300–1500
UPCD 15	–	–	–	–	–	–	–	300–2000	300–3000	–	250–1000	300–1500
UPCD 20	–	–	–	–	–	–	–	300–2000	300–3000	–	250–1000	300–1500

Vorschübe (f) und Schnitttiefen (a_p) | Avances (f) et profondeurs de passes (a_p) | Feed (f) and depths of cut (a_p) □ 97...

Schnittgeschwindigkeit (v_c)
Vitesse de coupe (v_c)
Cutting speed (v_c)

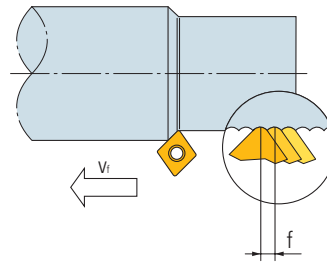
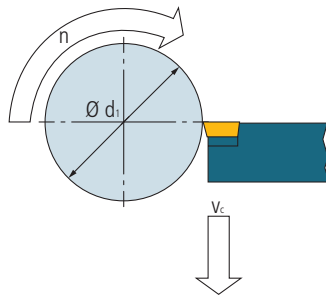
Umdrehungen pro Minute (n)
Nombre de tours par minute (n)
Revolutions per minute (n)

Vorschubgeschwindigkeit (v_f)
Avance (v_f)
Feedrate (v_f)

$$v_c = \frac{d_1 \cdot \pi \cdot n}{1000} \text{ [m/min]}$$

$$n = \frac{v_c \cdot 1000}{d_1 \cdot \pi} \text{ [min}^{-1}\text{]}$$

$$v_f = f \cdot n \text{ [mm/min]}$$



MULTIDEC®-BORE MICRO

Kurzbeschreibung
Gamme de produits
Product line

160

Anwendungen Innendrehen
Applications pour le tournage intérieur
Application ID turning



162

Schneiden
Grains
Inserts



164

Halter
Porte-outils
Holders



179

Ersatzteile
Pièces de rechange
Spare parts



183

Vorschübe und Schnitttiefen
Avances et profondeurs de passes
Feed and depths of cut

184

Schnittdaten
Données de coupe
Cutting specification

	Schnittgrößen Rein schneiden Deep unfluted	Schnittgrößen Rein schneiden Deep low fluted	Schnittgrößen Rein schneiden Deep high fluted	Schnittgrößen Rein schneiden Deep high fluted
Werkstoff Material Workpiece material	15-20	15-20	20-25	20-25
Kategorie Category Grade	1	2	3	4
Spindeldrehung Spindle Spinning method	✓	✓	✓	✓

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Anwendungsbereiche der Schneidstoffsorten
Domaines d'applications des matériaux de coupe
Application range of cutting grades

186

Multidec®-Bore Micro bietet ein breites Programm an Standardschneiden für die Innenbearbeitung im Miniaturbereich (Durchmesser 1.00 bis 8.00 mm). Scharfe Schneiden, kleine Eckenradien und geschliffene Spanleitstufen garantieren optimales Schnittverhalten. Für die Bearbeitung aller gängigen Werkstoffe, auch solcher, die schwierig zu zerspanen sind, stehen verschleißfeste und zugleich zähe Hartmetallsorten (UHM 20), beschichtet und unbeschichtet, zur Verfügung. Der Werkzeughalter aus hochvergütetem Stahl kann in handelsübliche Spannmittel eingebaut werden. Der Schneidenwechsel erfolgt von Hand und meist auch ohne erneutes Einmessen der axialen und radialen Lage.

Multidec®-Bore Micro, ce qui ce fait de mieux pour l'usinage intérieur pour les diamètres de 1.00 à 8.00 mm. Un très vaste choix de géométries font de cet outillage une référence dans le domaine de la pièce décolletée. Arêtes de coupe vive, petits rayons et brise copeaux affûté garantissent une fonctionnement optimale de la coupe. Pour l'usinage de matières difficiles, la nuance choisie est un carbure super micro grain (UHM 20), disponible revêtu et non revêtu. Le porte-outil peut être fixé directement sur la machine et aligné avec les plats de positionnement, ou alors monté en pince de type ER et aligné avec l'outil de réglage spécifique.

Multidec®-Bore Micro provides a wide range of inserts for miniaturized ID-turning (diameter between 1.00 and 8.00 mm). Sharp edges, small radii and ground surfaces guarantee accurate cutting. Multidec-Bore Micro is excellent for machining of common materials as well as exotic alloys. Bore Micro carbide tools are available with wear resistant coatings as well as uncoated. The heat-treated tool-holder can be fixed in a usual chuck or ID tool station. The inserts can be replaced by hand without any measuring or adjusting of axial and radial position. The unique clamping nut ensures accurate location of the boring tool and prevents vibration.



Vorteile

- Für die Innenbearbeitung im Miniaturbereich:
 - mit sehr hoher Positioniergenauigkeit
 - interner Kühlmittelzufuhr und
 - kleinstem Innendurchmesser 1 mm
- Wiederholgenauigkeit $\pm 10 \mu\text{m}$
- Scharfe Schneiden
- Je nach Bearbeitung verschleißfeste
 - zugleich zähe Hartmetallsorten (UHM 20)
 - beschichtet und unbeschichtet
- Universalhalter für alle Formen gleicher Baugröße
- Einmaliges Einrichten des Halters
 - Schneidenwechsel von Hand und
 - ohne erneutes Einrichten

Avantages

- Pour l'usinage intérieur avec des diamètres minimaux:
 - avec une grande précision de positionnement
 - arrosage central et
 - diamètre minimal de 1 mm
- Grande précision de répétitivité ($\pm 10 \mu\text{m}$)
- Arêtes de coupe vives
- Pour chaque usinage une nuance optimale
 - nuance en carbure (UHM 20)
 - revêtues et non revêtues
- Porte grain universel pour toutes les géométries de coupe disponible dans la même grandeur
- Étalonnage de l'outil une seule fois
 - changement des outils à la main et
 - sans ré-étalonnage

Advantages

- For internal machining methods with small diameters:
 - high precision of positioning
 - internal cooling system and
 - smallest internal diameter of 1 mm
- High repeat accuracy ($\pm 10 \mu\text{m}$)
- Sharp cutting edges
- Different coatings are available
- Universal holder for every tool form at the same size
- Set up of holder once
 - changing of inserts by hand and
 - without new set up



Nebst dem traditionellen Halter SDA..., mit Überwurfmutter, welcher einen schnellen Werkzeugwechsel ohne Schlüssel ermöglicht, bietet der neu entwickelte Superclamp-Halter SDA...SC zusätzliche Vorteile für das Spannen der Multidec®-Bore Micro Systemwerkzeuge, bei denen mehr Stabilität und Haltekraft erforderlich sind. Schwer zerspanbare Materialien, spezielle Bearbeitungen wie Mehrkantstossen, Hartdrehen mit CBN sowie das Erreichen von feinsten Oberflächengüten in NE-Metallen mit PKD-, CVD- oder MKD bestückten Werkzeugen sind nicht nur für die Schneiden sondern auch für die Halter eine Herausforderung. Superclamp bietet hierfür eine optimale Lösung. Die Positionierung des Schneidwerkzeugs erfolgt wie beim traditionellen Halter durch das Anschlagen an den quer eingebauten Stift. Das Spannen geschieht durch ein Klemmteil, welches von vorne mit einem Innensechskantschlüssel angezogen wird. Dadurch wird das Werkzeug in die genaue Position gebracht und radial gespannt. Ist der Halter einmal eingerichtet, können die Schneiden mit einer Wiederholgenauigkeit von ± 0.01 mm, ohne erneutes Korrigieren, gewechselt werden. Ein breites Programm an Haltern mit Innenkühlung, für Schäfte 4, 6 und 8 mm, in gängigen Abmessungen, steht zur Verfügung.

Supplémentaire à l'outil traditionnel SDA... avec écrou, qui permet un vite changement de l'outil à la main, le nouveau outil développé, Superclamp SDA...SC donne des ultérieurs avantages pour le serrage des outils du système Multidec®-Bore Micro, surtout dans des plus hautes exigences à la stabilité et la force de serrage. Les matières difficiles à usiner, l'étampage, l'usinage du trempé avec CBN comme aussi l'usinage de surfaces ultrafines dans des matières non ferreux avec du PCD, CVD-Diamant et MCD représentent un défi pas seulement pour l'outil mais aussi pour le porte outil. Superclamp donne à l'utilisateur une solution optimale.

Le positionnement de l'outil se fait, comme connu du porte outil traditionnel, à travers l'appui sur la goupille monté dans le porte outil. Le serrage se fait avec une coulisse qui peut être serré avec une clef Inbus. Pendant le serrage l'outil va se mettre à sa position et après se fixer radialement. Une fois que l'outil est étalonné, le changement des grains peut être fait, avec une répétibilité de ± 0.01 mm, sans un ré-étalonnage. Un vaste gamme de porte outils avec arrosage central, en courantes dimensions, sont à disposition pour les queues de 4, 6 et 8 mm.

In addition to the traditional holder SDA..., which permits a fast changing of inserts by hand, the new developed holder SDA...SC, offers more advantages in clamping of Multidec®-Bore Micro inserts, especially if higher holding forces and better stability are needed. Difficult to machine materials, broaching, hard cutting with CBN and machining of finest surfaces with PCD, CVD-Diamond and MCD, in non ferrous materials, can be a big challenge not only for the inserts, but for the holders, too. For all these challenges we recommend Superclamp, which offers the perfect solution for the user.

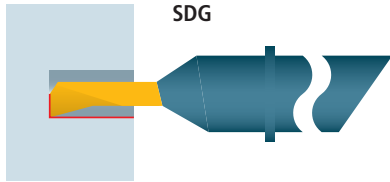
The positioning of the insert is accomplished just like in the traditional holder, by leaning on to the positioning dowel pin located in the holder. The clamping then is done with a wedge that is moved by an allen wrench. During the clamping process the insert positions itself on the dowel pin and is being clamped with radial force. Once the set up of the holder is made, inserts can be changed with a high repeat accuracy of ± 0.01 mm without a new set up.

A large range of holders is available for inserts with diameters of 4, 6 and 8 mm. They are equipped with internal cooling and the dimensions and outside diameters are based on the current holders.



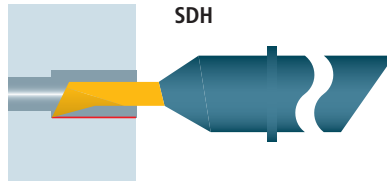
Bohren und Längsdrehen
 Perçage et Tournage
 Drilling and Turning

Schneiden | Grains | Inserts □ 165...



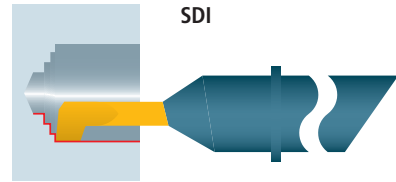
Vornedrehen
 Tournage avant
 Front turning

Schneiden | Grains | Inserts □ 166...



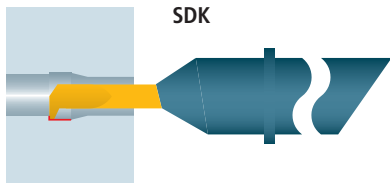
Längs- und Plandrehen
 Tournage et dressage
 Turning and facing

Schneiden | Grains | Inserts □ 167...



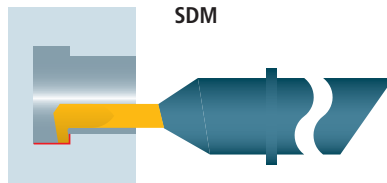
Längs- und Vornedrehen
 Tournage et tournage avant
 Turning and front turning

Schneiden | Grains | Inserts □ 168...



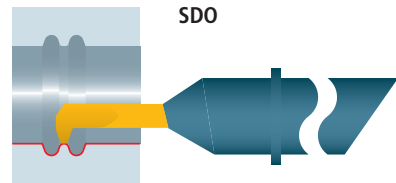
Hintendrehen
 Tournage arrière
 Back turning

Schneiden | Grains | Inserts □ 169...



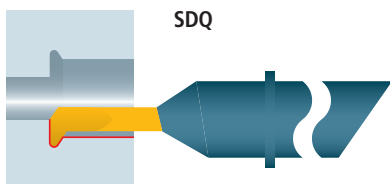
Längsdrehen
 Tournage
 Turning

Schneiden | Grains | Inserts □ 170...



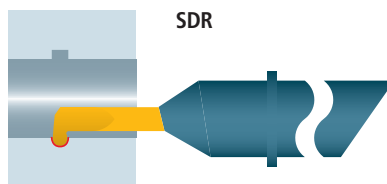
Längsdrehen
 Tournage
 Turning

Schneiden | Grains | Inserts □ 171...



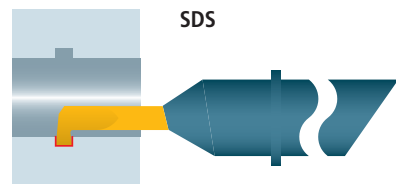
Radius-Einstich
 Rainurage-rayonnage
 Radius-grooving

Schneiden | Grains | Inserts □ 172...



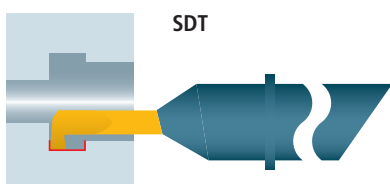
Einstechen
 Rainurage
 Grooving

Schneiden | Grains | Inserts □ 173...



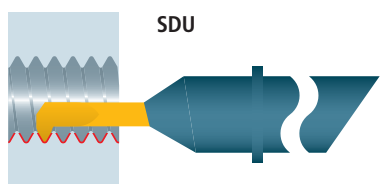
Einstechen und Längsdrehen
 Fonçage et Tournage
 Grooving and Turning

Schneiden | Grains | Inserts □ 174...



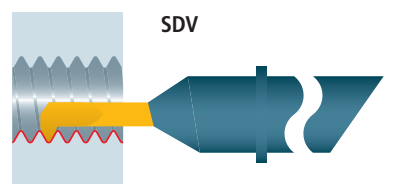
Gewindedrehen (Teilprofil)
 Filetage (profil partiel)
 Threading (partial profile)

Schneiden | Grains | Inserts □ 175...



Gewindedrehen (Vollprofil)
 Filetage (profil complet)
 Threading (full profile)

Schneiden | Grains | Inserts □ 176...



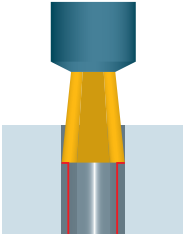
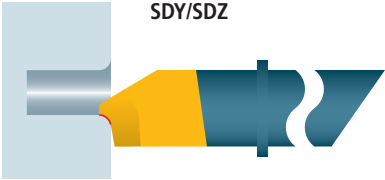
Fasen
Chanfreinage
Chamfering

Mehrkantstossen (auf Wunsch)
Étampage (sur demande)
Broaching (on demand)

Sonderschneiden (auf Wunsch)
Outils spéciales (sur demande)
Special inserts (on demand)

Schneiden | Grains | Inserts □ 177...

Schneiden | Grains | Inserts



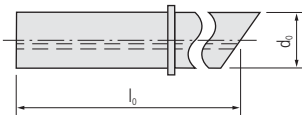
Halter | Porte-outils | Holders □ 179...

Alle Abbildungen sind in rechter Ausführung dargestellt. Linke Ausführung auch lieferbar.

Toutes les illustrations représentent des exécutions à droite. Les exécutions à gauche sont aussi livrables.

All illustrations show right hand design. Left hand design is also available.

Rohling | Ebauche | Blank

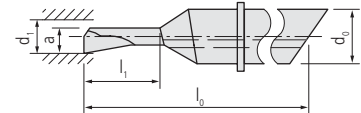
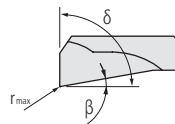
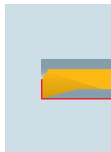


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UTILIS®
Tooling for High Technology

Bezeichnung Désignation Designation	Hartmetall Carbure Carbide □ 186	Dimensionen Dimensions Dimensions										Halter Porte-outil Holder
		d ₀	l ₀									
SD...	● ○ ○ ●											□ 179...
R Rechte Ausführung Exécution droite Right execution	UHM 20 ...											
SD 448 R	■	4	48									SDA 4...
SD 668 R	■	6	68									SDA 6...
SD 882 R	■	8	82									SDA 8...

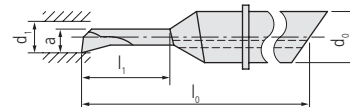
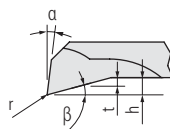
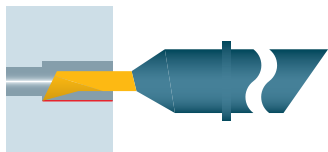
Bohren und Längsdrehen | Perçage et tournage | Drilling and turning



Bezeichnung Désignation Designation	Hartmetall Carbure Carbide □ 186		Dimensionen Dimensions Dimensions											Halter Porte-outil Holder
	●	●	D	l ₁	d ₀	d ₁	a	l ₀	r _{max.}	β	δ			
SDG...	○	○												□ 179...
R Rechte Ausführung* Exécution droite* Right execution*	○	○												
	UHM 20	UHM 20 HX												
SDG 435 042 R	■	■	0.5	1.5	4	0.42	0.38	35	0.01	2.5°	90°			SDA 4...
SDG 435 092 R	■	■	1	3	4	0.92	0.83	35	0.02	2.5°	90°			SDA 4...
SDG 440 092 R	■	■	1	3	4	0.92	0.83	40	0.03	2.5°	90°			SDA 4...
SDG 448 092 R	■	■	1	5	4	0.92	0.83	48	0.03	2.5°	90°			SDA 4...
SDG 435 142 R	■	■	1.5	4.5	4	1.42	1.28	35	0.02	2.5°	90°			SDA 4...
SDG 440 142 R	■	■	1.5	4.5	4	1.42	1.28	40	0.04	2.5°	90°			SDA 4...
SDG 448 142 R	■	■	1.5	7.5	4	1.42	1.28	48	0.04	2.5°	90°			SDA 4...
SDG 435 192 R	■	■	2	6	4	1.92	1.73	35	0.03	2.5°	90°			SDA 4...
SDG 440 192 R	■	■	2	6	4	1.92	1.73	40	0.04	2.5°	90°			SDA 4...
SDG 448 192 R	■	■	2	10	4	1.92	1.73	48	0.04	2.5°	90°			SDA 4...
SDG 435 242 R	■	■	2.5	7.5	4	2.42	2.18	35	0.03	2.5°	90°			SDA 4...
SDG 440 242 R	■	■	2.5	7.5	4	2.42	2.18	40	0.05	2.5°	90°			SDA 4...
SDG 448 242 R	■	■	2.5	12.5	4	2.42	2.18	48	0.05	2.5°	90°			SDA 4...
SDG 440 292 R	■	■	3	9	4	2.92	2.63	40	0.05	2.5°	90°			SDA 4...
SDG 448 292 R	■	■	3	15	4	2.92	2.63	48	0.05	2.5°	90°			SDA 4...
SDG 440 342 R	■	■	3.5	10.5	4	3.42	3.08	40	0.06	2.5°	90°			SDA 4...
SDG 448 342 R	■	■	3.5	17.5	4	3.42	3.08	48	0.06	2.5°	90°			SDA 4...
SDG 440 392 R	■	■	4	12	4	3.92	3.53	40	0.06	2.5°	90°			SDA 4...
SDG 448 392 R	■	■	4	20	4	3.92	3.53	48	0.06	2.5°	90°			SDA 4...
SDG 644 442 R	■	■	4.5	9	6	4.42	3.98	44	0.07	2.5°	90°			SDA 6...
SDG 656 442 R	■	■	4.5	18	6	4.42	3.98	56	0.07	2.5°	90°			SDA 6...
SDG 668 442 R	■	■	4.5	27	6	4.42	3.98	68	0.07	2.5°	90°			SDA 6...
SDG 644 492 R	■	■	5	10	6	4.92	4.43	44	0.07	2.5°	90°			SDA 6...
SDG 656 492 R	■	■	5	20	6	4.92	4.43	56	0.07	2.5°	90°			SDA 6...
SDG 668 492 R	■	■	5	30	6	4.92	4.43	68	0.07	2.5°	90°			SDA 6...
SDG 644 542 R	■	■	5.5	11	6	5.42	4.88	44	0.08	2.5°	90°			SDA 6...
SDG 656 542 R	■	■	5.5	22	6	5.42	4.88	56	0.08	2.5°	90°			SDA 6...
SDG 668 542 R	■	■	5.5	33	6	5.42	4.88	68	0.08	2.5°	90°			SDA 6...
SDG 644 592 R	■	■	6	12	6	5.92	5.33	44	0.08	2.5°	90°			SDA 6...
SDG 656 592 R	■	■	6	24	6	5.92	5.33	56	0.08	2.5°	90°			SDA 6...
SDG 668 592 R	■	■	6	36	6	5.92	5.33	68	0.08	2.5°	90°			SDA 6...
SDG 850 692 R	■	■	7	14	8	6.92	6.23	50	0.09	2.5°	90°			SDA 8...
SDG 866 692 R	■	■	7	28	8	6.92	6.23	66	0.09	2.5°	90°			SDA 8...
SDG 882 692 R	■	■	7	42	8	6.92	6.23	82	0.09	2.5°	90°			SDA 8...
SDG 850 792 R	■	■	8	16	8	7.92	7.13	50	0.1	2.5°	90°			SDA 8...
SDG 866 792 R	■	■	8	32	8	7.92	7.13	66	0.1	2.5°	90°			SDA 8...
SDG 882 792 R	■	■	8	48	8	7.92	7.13	82	0.1	2.5°	90°			SDA 8...

* Linke Ausführung und andere Beschichtungen auf Anfrage | Exécution gauche et autres revêtements sur demande | Left execution and other coatings on demand

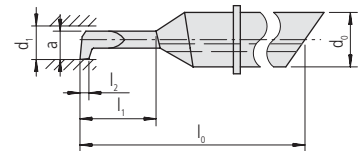
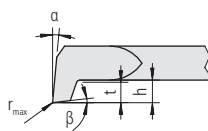
Vornedrehen | Tournage avant | Front turning



Bezeichnung Désignation Designation	Hartmetall Carbure Carbide □ 186		Dimensionen Dimensions Dimensions												Halter Porte-outil Holder
	●	●	D	l ₁	d ₀	d ₁	a	h	t	l ₀	r	α	β		
SDH...	○	○													□ 179...
R Rechte Ausführung* Exécution droite* Right execution*	UHM 20	UHM 20 HX													
SDH 435 042 R	■	■	0.5	1.5	4	0.42	0.38	0.09	0.07	35	0.05	7.5°	22.5°		SDA 4...
SDH 435 092 R	■	■	1	3	4	0.92	0.83	0.19	0.15	35	0.05	7.5°	22.5°		SDA 4...
SDH 440 092 R	■	■	1	3	4	0.92	0.83	0.21	0.16	40	0.05	7.5°	22.5°		SDA 4...
SDH 448 092 R	■	■	1	5	4	0.92	0.83	0.21	0.16	48	0.05	7.5°	22.5°		SDA 4...
SDH 435 142 R	■	■	1.5	4.5	4	1.42	1.28	0.3	0.23	35	0.05	7.5°	22.5°		SDA 4...
SDH 440 142 R	■	■	1.5	4.5	4	1.42	1.28	0.31	0.23	40	0.05	7.5°	22.5°		SDA 4...
SDH 448 142 R	■	■	1.5	7.5	4	1.42	1.28	0.31	0.23	48	0.05	7.5°	22.5°		SDA 4...
SDH 435 192 R	■	■	2	6	4	1.92	1.73	0.4	0.31	35	0.05	7.5°	22.5°		SDA 4...
SDH 440 192 R	■	■	2	6	4	1.92	1.73	0.41	0.31	40	0.05	7.5°	22.5°		SDA 4...
SDH 448 192 R	■	■	2	10	4	1.92	1.73	0.41	0.31	48	0.05	7.5°	22.5°		SDA 4...
SDH 435 242 R	■	■	2.5	7.5	4	2.42	2.18	0.51	0.39	35	0.05	7.5°	22.5°		SDA 4...
SDH 440 242 R	■	■	2.5	7.5	4	2.42	2.18	0.52	0.39	40	0.05	7.5°	22.5°		SDA 4...
SDH 448 242 R	■	■	2.5	12.5	4	2.42	2.18	0.52	0.39	48	0.05	7.5°	22.5°		SDA 4...
SDH 440 292 R	■	■	3	9	4	2.92	2.63	0.62	0.47	40	0.05	7.5°	22.5°		SDA 4...
SDH 448 292 R	■	■	3	15	4	2.92	2.63	0.62	0.47	48	0.05	7.5°	22.5°		SDA 4...
SDH 440 342 R	■	■	3.5	10.5	4	3.42	3.08	0.72	0.54	40	0.05	7.5°	22.5°		SDA 4...
SDH 448 342 R	■	■	3.5	17.5	4	3.42	3.08	0.72	0.54	48	0.05	7.5°	22.5°		SDA 4...
SDH 440 392 R	■	■	4	12	4	3.92	3.53	0.83	0.62	40	0.05	7.5°	22.5°		SDA 4...
SDH 448 392 R	■	■	4	20	4	3.92	3.53	0.83	0.62	48	0.05	7.5°	22.5°		SDA 4...
SDH 644 442 R	■	■	4.5	9	6	4.42	3.98	0.93	0.7	44	0.05	7.5°	22.5°		SDA 6...
SDH 656 442 R	■	■	4.5	18	6	4.42	3.98	0.93	0.7	56	0.05	7.5°	22.5°		SDA 6...
SDH 668 442 R	■	■	4.5	27	6	4.42	3.98	0.93	0.7	68	0.05	7.5°	22.5°		SDA 6...
SDH 644 492 R	■	■	5	10	6	4.92	4.43	1.04	0.78	44	0.05	7.5°	22.5°		SDA 6...
SDH 656 492 R	■	■	5	20	6	4.92	4.43	1.04	0.78	56	0.05	7.5°	22.5°		SDA 6...
SDH 668 492 R	■	■	5	30	6	4.92	4.43	1.04	0.78	68	0.05	7.5°	22.5°		SDA 6...
SDH 644 542 R	■	■	5.5	11	6	5.42	4.88	1.14	0.85	44	0.05	7.5°	22.5°		SDA 6...
SDH 656 542 R	■	■	5.5	22	6	5.42	4.88	1.14	0.85	56	0.05	7.5°	22.5°		SDA 6...
SDH 668 542 R	■	■	5.5	33	6	5.42	4.88	1.14	0.85	68	0.05	7.5°	22.5°		SDA 6...
SDH 644 592 R	■	■	6	12	6	5.92	5.33	1.24	0.93	44	0.05	7.5°	22.5°		SDA 6...
SDH 656 592 R	■	■	6	24	6	5.92	5.33	1.24	0.93	56	0.05	7.5°	22.5°		SDA 6...
SDH 668 592 R	■	■	6	36	6	5.92	5.33	1.24	0.93	68	0.05	7.5°	22.5°		SDA 6...
SDH 850 692 R	■	■	7	14	8	6.92	6.23	1.45	1.09	50	0.05	7.5°	22.5°		SDA 8...
SDH 866 692 R	■	■	7	28	8	6.92	6.23	1.45	1.09	66	0.05	7.5°	22.5°		SDA 8...
SDH 882 692 R	■	■	7	42	8	6.92	6.23	1.45	1.09	82	0.05	7.5°	22.5°		SDA 8...
SDH 850 792 R	■	■	8	16	8	7.92	7.13	1.66	1.24	50	0.05	7.5°	22.5°		SDA 8...
SDH 866 792 R	■	■	8	32	8	7.92	7.13	1.66	1.24	66	0.05	7.5°	22.5°		SDA 8...
SDH 882 792 R	■	■	8	48	8	7.92	7.13	1.66	1.24	82	0.05	7.5°	22.5°		SDA 8...

* Linke Ausführung und andere Beschichtungen auf Anfrage | Exécution gauche et autres revêtements sur demande | Left execution and other coatings on demand

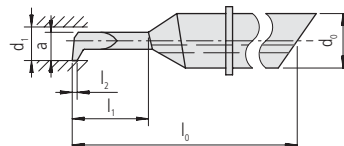
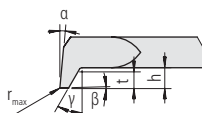
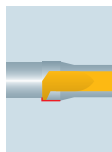
Längs- und Plandrehen | Tournage et dressage | Turning and facing



Bezeichnung Désignation Designation	Hartmetall Carbure Carbide □ 186		Dimensionen Dimensions Dimensions												Halter Porte-outil Holder
	●	●	D _{min}	l ₁	d ₀	d ₁	a	h	t	l ₀	l ₂	r _{max}	α	β	
SDI...	○	○													□ 179...
R Rechte Ausführung* Exécution droite* Right execution*	○	○													
	UHM 20	UHM 20 HX													
SDI 435 042 R	■	■	0.5	1.5	4	0.42	0.38	0.11	0.07	35	0.5	0.01	0.5°	2.5°	SDA 4...
SDI 435 092 R	■	■	1.0	3	4	0.92	0.83	0.23	0.15	35	1	0.02	0.5°	2.5°	SDA 4...
SDI 440 092 R	■	■	1.0	3	4	0.92	0.83	0.23	0.1	40	1	0.02	0.5°	2.5°	SDA 4...
SDI 448 092 R	■	■	1.0	5	4	0.92	0.83	0.23	0.1	48	1	0.02	0.5°	2.5°	SDA 4...
SDI 435 142 R	■	■	1.5	4.5	4	1.42	1.28	0.36	0.23	35	1.5	0.02	0.5°	2.5°	SDA 4...
SDI 440 142 R	■	■	1.5	4.5	4	1.42	1.28	0.36	0.2	40	1.5	0.02	0.5°	2.5°	SDA 4...
SDI 448 142 R	■	■	1.5	7.5	4	1.42	1.28	0.36	0.2	48	1.5	0.02	0.5°	2.5°	SDA 4...
SDI 435 192 R	■	■	2.0	6	4	1.92	1.73	0.48	0.32	35	2	0.03	0.5°	2.5°	SDA 4...
SDI 440 192 R	■	■	2.0	6	4	1.92	1.73	0.48	0.3	40	2	0.02	0.5°	2.5°	SDA 4...
SDI 448 192 R	■	■	2.0	10	4	1.92	1.73	0.48	0.3	48	2	0.02	0.5°	2.5°	SDA 4...
SDI 435 242 R	■	■	2.5	7.5	4	2.42	2.18	0.61	0.40	35	2.5	0.03	0.5°	2.5°	SDA 4...
SDI 440 242 R	■	■	2.5	7.5	4	2.42	2.18	0.61	0.4	40	2.5	0.02	0.5°	2.5°	SDA 4...
SDI 448 242 R	■	■	2.5	12.5	4	2.42	2.18	0.61	0.4	48	2.5	0.02	0.5°	2.5°	SDA 4...
SDI 440 292 R	■	■	3.0	9	4	2.92	2.63	0.73	0.5	40	3	0.02	0.5°	2.5°	SDA 4...
SDI 448 292 R	■	■	3.0	15	4	2.92	2.63	0.73	0.5	48	3	0.02	0.5°	2.5°	SDA 4...
SDI 440 342 R	■	■	3.5	10.5	4	3.42	3.08	0.86	0.6	40	3.5	0.02	0.5°	2.5°	SDA 4...
SDI 448 342 R	■	■	3.5	17.5	4	3.42	3.08	0.86	0.6	48	3.5	0.02	0.5°	2.5°	SDA 4...
SDI 440 392 R	■	■	4.0	12	4	3.92	3.53	0.98	0.7	40	4	0.02	0.5°	2.5°	SDA 4...
SDI 440 392 R	■	■	4.0	20	4	3.92	3.53	0.98	0.7	48	4	0.02	0.5°	2.5°	SDA 4...
SDI 644 442 R	■	■	4.5	9	6	4.42	3.98	1.11	0.7	44	4.5	0.02	0.5°	2.5°	SDA 6...
SDI 656 442 R	■	■	4.5	18	6	4.42	3.98	1.11	0.7	56	4.5	0.02	0.5°	2.5°	SDA 6...
SDI 668 442 R	■	■	4.5	27	6	4.42	3.98	1.11	0.7	68	4.5	0.02	0.5°	2.5°	SDA 6...
SDI 644 492 R	■	■	5.0	10	6	4.92	4.43	1.23	0.8	44	5	0.02	0.5°	2.5°	SDA 6...
SDI 656 492 R	■	■	5.0	20	6	4.92	4.43	1.23	0.8	56	5	0.02	0.5°	2.5°	SDA 6...
SDI 668 492 R	■	■	5.0	30	6	4.92	4.43	1.23	0.8	68	5	0.02	0.5°	2.5°	SDA 6...
SDI 644 542 R	■	■	5.5	11	6	5.42	4.88	1.36	0.9	44	5.5	0.02	0.5°	2.5°	SDA 6...
SDI 656 542 R	■	■	5.5	22	6	5.42	4.88	1.36	0.9	56	5.5	0.02	0.5°	2.5°	SDA 6...
SDI 668 542 R	■	■	5.5	33	6	5.42	4.88	1.36	0.9	68	5.5	0.02	0.5°	2.5°	SDA 6...
SDI 644 592 R	■	■	6.0	12	6	5.92	5.33	1.48	1	44	6	0.02	0.5°	2.5°	SDA 6...
SDI 656 592 R	■	■	6.0	24	6	5.92	5.33	1.48	1	56	6	0.02	0.5°	2.5°	SDA 6...
SDI 668 592 R	■	■	6.0	36	6	5.92	5.33	1.48	1	68	6	0.02	0.5°	2.5°	SDA 6...
SDI 850 692 R	■	■	7.0	14	8	6.92	6.23	1.73	1.2	50	7	0.02	0.5°	2.5°	SDA 8...
SDI 866 692 R	■	■	7.0	28	8	6.92	6.23	1.73	1.2	66	7	0.02	0.5°	2.5°	SDA 8...
SDI 882 692 R	■	■	7.0	42	8	6.92	6.23	1.73	1.2	82	7	0.02	0.5°	2.5°	SDA 8...
SDI 850 792 R	■	■	8.0	16	8	7.92	7.13	1.98	1.3	50	8	0.02	0.5°	2.5°	SDA 8...
SDI 866 792 R	■	■	8.0	32	8	7.92	7.13	1.98	1.3	66	8	0.02	0.5°	2.5°	SDA 8...
SDI 882 792 R	■	■	8.0	48	8	7.92	7.13	1.98	1.3	82	8	0.02	0.5°	2.5°	SDA 8...

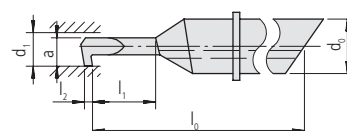
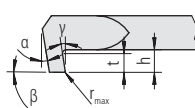
* Linke Ausführung und andere Beschichtungen auf Anfrage | Exécution gauche et autres revêtements sur demande | Left execution and other coatings on demand

Längs- und Vornedrehen | Tournage et tournage avant | Turning and front turning



Bezeichnung Désignation Designation	Hartmetall Carbure Carbide		Dimensionen Dimensions Dimensions													Halter Porte-outil Holder
	186	186	D _{min}	l ₁	d ₀	d ₁	a	h	t	l ₀	l ₂	r _{max}	α	β	γ	
SDK...	●	●														179...
R Rechte Ausführung* Exécution droite* Right execution*	UHM 20	UHM 20 HX														
SDK 435 092 R	■	■	1	1.5	4	0.92	0.83	0.23	0.15	35	0.5	0.02	0.5°	0.5°	30°	SDA 4...
SDK 440 092 R	■	■	1	3	4	0.92	0.83	0.23	0.1	40	0.5	0.02	0.5°	0.5°	30°	SDA 4...
SDK 448 092 R	■	■	1	5	4	0.92	0.83	0.23	0.1	48	0.5	0.02	0.5°	0.5°	30°	SDA 4...
SDK 435 142 R	■	■	1.5	4.5	4	1.42	1.28	0.36	0.23	35	0.75	0.02	0.5°	0.5°	30°	SDA 4...
SDK 440 142 R	■	■	1.5	4.5	4	1.42	1.28	0.36	0.2	40	0.75	0.02	0.5°	0.5°	30°	SDA 4...
SDK 448 142 R	■	■	1.5	7.5	4	1.42	1.28	0.36	0.2	48	0.75	0.02	0.5°	0.5°	30°	SDA 4...
SDK 435 192 R	■	■	2	6	4	1.92	1.73	0.48	0.32	35	1	0.03	0.5°	0.5°	30°	SDA 4...
SDK 440 192 R	■	■	2	6	4	1.92	1.73	0.48	0.3	40	1	0.02	0.5°	0.5°	30°	SDA 4...
SDK 448 192 R	■	■	2	10	4	1.92	1.73	0.48	0.3	48	1	0.02	0.5°	0.5°	30°	SDA 4...
SDK 435 242 R	■	■	2.5	7.5	4	2.42	2.18	0.61	0.40	35	1.25	0.03	0.5°	0.5°	30°	SDA 4...
SDK 440 242 R	■	■	2.5	7.5	4	2.42	2.18	0.61	0.4	40	1.25	0.02	0.5°	0.5°	30°	SDA 4...
SDK 448 242 R	■	■	2.5	12.5	4	2.42	2.18	0.61	0.4	48	1.25	0.02	0.5°	0.5°	30°	SDA 4...
SDK 440 292 R	■	■	3	9	4	2.92	2.63	0.73	0.5	40	1.5	0.02	0.5°	0.5°	30°	SDA 4...
SDK 448 292 R	■	■	3	15	4	2.92	2.63	0.73	0.5	48	1.5	0.02	0.5°	0.5°	30°	SDA 4...
SDK 440 342 R	■	■	3.5	10.5	4	3.42	3.08	0.86	0.6	40	1.75	0.02	0.5°	0.5°	30°	SDA 4...
SDK 448 342 R	■	■	3.5	17.5	4	3.42	3.08	0.86	0.6	48	1.75	0.02	0.5°	0.5°	30°	SDA 4...
SDK 440 392 R	■	■	4	12	4	3.92	3.53	0.98	0.7	40	2	0.02	0.5°	0.5°	30°	SDA 4...
SDK 448 392 R	■	■	4	20	4	3.92	3.53	0.98	0.7	48	2	0.02	0.5°	0.5°	30°	SDA 4...
SDK 644 442 R	■	■	4.5	9	6	4.42	3.98	1.11	0.7	44	2.25	0.02	0.5°	0.5°	30°	SDA 6...
SDK 656 442 R	■	■	4.5	18	6	4.42	3.98	1.11	0.7	56	2.25	0.02	0.5°	0.5°	30°	SDA 6...
SDK 668 442 R	■	■	4.5	27	6	4.42	3.98	1.11	0.7	68	2.25	0.02	0.5°	0.5°	30°	SDA 6...
SDK 644 492 R	■	■	5	10	6	4.92	4.43	1.23	0.8	44	2.5	0.02	0.5°	0.5°	30°	SDA 6...
SDK 656 492 R	■	■	5	20	6	4.92	4.43	1.23	0.8	56	2.5	0.02	0.5°	0.5°	30°	SDA 6...
SDK 668 492 R	■	■	5	30	6	4.92	4.43	1.23	0.8	68	2.5	0.02	0.5°	0.5°	30°	SDA 6...
SDK 644 542 R	■	■	5.5	11	6	5.42	4.88	1.36	0.9	44	2.75	0.02	0.5°	0.5°	30°	SDA 6...
SDK 656 542 R	■	■	5.5	22	6	5.42	4.88	1.36	0.9	56	2.75	0.02	0.5°	0.5°	30°	SDA 6...
SDK 668 542 R	■	■	5.5	33	6	5.42	4.88	1.36	0.9	68	2.75	0.02	0.5°	0.5°	30°	SDA 6...
SDK 644 592 R	■	■	6	12	6	5.92	5.33	1.48	1	44	3	0.02	0.5°	0.5°	30°	SDA 6...
SDK 656 592 R	■	■	6	24	6	5.92	5.33	1.48	1	56	3	0.02	0.5°	0.5°	30°	SDA 6...
SDK 668 592 R	■	■	6	36	6	5.92	5.33	1.48	1	68	3	0.02	0.5°	0.5°	30°	SDA 6...
SDK 850 692 R	■	■	7	14	8	6.92	6.23	1.73	1.2	50	3.5	0.02	0.5°	0.5°	30°	SDA 8...
SDK 866 692 R	■	■	7	28	8	6.92	6.23	1.73	1.2	66	3.5	0.02	0.5°	0.5°	30°	SDA 8...
SDK 882 692 R	■	■	7	42	8	6.92	6.23	1.73	1.2	82	3.5	0.02	0.5°	0.5°	30°	SDA 8...
SDK 850 792 R	■	■	8	16	8	7.92	7.13	1.98	1.3	50	4	0.02	0.5°	0.5°	30°	SDA 8...
SDK 866 792 R	■	■	8	32	8	7.92	7.13	1.98	1.3	66	4	0.02	0.5°	0.5°	30°	SDA 8...
SDK 882 792 R	■	■	8	48	8	7.92	7.13	1.98	1.3	82	4	0.02	0.5°	0.5°	30°	SDA 8...

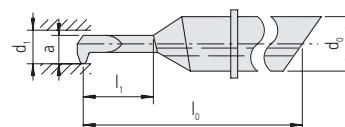
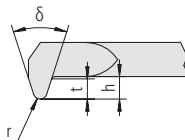
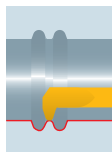
* Linke Ausführung und andere Beschichtungen auf Anfrage | Exécution gauche et autres revêtements sur demande | Left execution and other coatings on demand



Bezeichnung Désignation Designation			Hartmetall Carbure Carbide		Dimensionen Dimensions Dimensions											Halter Porte-outil Holder		
					D _{min}	l ₁	d ₀	d ₁	a	h	t	l ₀	l ₂	r _{max}	α	β	γ	
SDM...																		 179...
 Rechte Ausführung* Exécution droite* Right execution*			UHM 20	UHM 20 HX														
SDM 435 092 R					1	1.5	4	0.92	0.83	0.23	0.15	35	0.5	0.02	30°	0.5°	0.5°	SDA 4...
SDM 440 092 R					1	3	4	0.92	0.83	0.23	0.1	40	0.5	0.02	30°	0.5°	0.5°	SDA 4...
SDM 448 092 R					1	5	4	0.92	0.83	0.23	0.1	48	0.5	0.02	30°	0.5°	0.5°	SDA 4...
SDM 435 142 R					1.5	4.5	4	1.42	1.28	0.36	0.23	35	0.75	0.02	30°	0.5°	0.5°	SDA 4...
SDM 440 142 R					1.5	4.5	4	1.42	1.28	0.36	0.2	40	0.75	0.02	30°	0.5°	0.5°	SDA 4...
SDM 448 142 R					1.5	7.5	4	1.42	1.28	0.36	0.2	48	0.75	0.02	30°	0.5°	0.5°	SDA 4...
SDM 435 192 R					2	6	4	1.92	1.73	0.48	0.32	35	1	0.03	30°	0.5°	0.5°	SDA 4...
SDM 440 192 R					2	6	4	1.92	1.73	0.48	0.3	40	1	0.02	30°	0.5°	0.5°	SDA 4...
SDM 448 192 R					2	10	4	1.92	1.73	0.48	0.3	48	1	0.02	30°	0.5°	0.5°	SDA 4...
SDM 435 242 R					2.5	7.5	4	2.42	2.18	0.61	0.40	35	1.25	0.03	30°	0.5°	0.5°	SDA 4...
SDM 440 242 R					2.5	7.5	4	2.42	2.18	0.61	0.4	40	1.25	0.02	30°	0.5°	0.5°	SDA 4...
SDM 448 242 R					2.5	12.5	4	2.42	2.18	0.61	0.4	48	1.25	0.02	30°	0.5°	0.5°	SDA 4...
SDM 440 292 R					3	9	4	2.92	2.63	0.73	0.5	40	1.5	0.02	30°	0.5°	0.5°	SDA 4...
SDM 448 292 R					3	15	4	2.92	2.63	0.73	0.5	48	1.5	0.02	30°	0.5°	0.5°	SDA 4...
SDM 440 342 R					3.5	10.5	4	3.42	3.08	0.86	0.6	40	1.75	0.02	30°	0.5°	0.5°	SDA 4...
SDM 448 342 R					3.5	17.5	4	3.42	3.08	0.86	0.6	48	1.75	0.02	30°	0.5°	0.5°	SDA 4...
SDM 440 392 R					4	12	4	3.92	3.53	0.98	0.7	40	2	0.02	30°	0.5°	0.5°	SDA 4...
SDM 448 392 R					4	20	4	3.92	3.53	0.98	0.7	48	2	0.02	30°	0.5°	0.5°	SDA 4...
SDM 644 442 R					4.5	9	6	4.42	3.98	1.11	0.7	44	2.25	0.02	30°	0.5°	0.5°	SDA 6...
SDM 656 442 R					4.5	18	6	4.42	3.98	1.11	0.7	56	2.25	0.02	30°	0.5°	0.5°	SDA 6...
SDM 668 442 R					4.5	27	6	4.42	3.98	1.11	0.7	68	2.25	0.02	30°	0.5°	0.5°	SDA 6...
SDM 644 492 R					5	10	6	4.92	4.43	1.23	0.8	44	2.5	0.02	30°	0.5°	0.5°	SDA 6...
SDM 656 492 R					5	20	6	4.92	4.43	1.23	0.8	56	2.5	0.02	30°	0.5°	0.5°	SDA 6...
SDM 668 492 R					5	30	6	4.92	4.43	1.23	0.8	68	2.5	0.02	30°	0.5°	0.5°	SDA 6...
SDM 644 542 R					5.5	11	6	5.42	4.88	1.36	0.9	44	2.75	0.02	30°	0.5°	0.5°	SDA 6...
SDM 656 542 R					5.5	22	6	5.42	4.88	1.36	0.9	56	2.75	0.02	30°	0.5°	0.5°	SDA 6...
SDM 668 542 R					5.5	33	6	5.42	4.88	1.36	0.9	68	2.75	0.02	30°	0.5°	0.5°	SDA 6...
SDM 644 592 R					6	12	6	5.92	5.33	1.48	1	44	3	0.02	30°	0.5°	0.5°	SDA 6...
SDM 656 592 R					6	24	6	5.92	5.33	1.48	1	56	3	0.02	30°	0.5°	0.5°	SDA 6...
SDM 668 592 R					6	36	6	5.92	5.33	1.48	1	68	3	0.02	30°	0.5°	0.5°	SDA 6...
SDM 850 692 R					7	14	8	6.92	6.23	1.73	1.2	50	3.5	0.02	30°	0.5°	0.5°	SDA 8...
SDM 866 692 R					7	28	8	6.92	6.23	1.73	1.2	66	3.5	0.02	30°	0.5°	0.5°	SDA 8...
SDM 882 692 R					7	42	8	6.92	6.23	1.73	1.2	82	3.5	0.02	30°	0.5°	0.5°	SDA 8...
SDM 850 792 R					8	16	8	7.92	7.13	1.98	1.3	50	4	0.02	30°	0.5°	0.5°	SDA 8...
SDM 866 792 R					8	32	8	7.92	7.13	1.98	1.3	66	4	0.02	30°	0.5°	0.5°	SDA 8...
SDM 882 792 R					8	48	8	7.92	7.13	1.98	1.3	82	4	0.02	30°	0.5°	0.5°	SDA 8...

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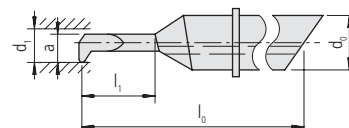
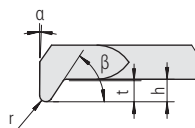
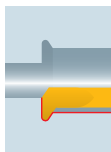
Längsdrehen | Tournage | Turning



Bezeichnung Désignation Designation	Hartmetall Carbure Carbide		Dimensionen Dimensions Dimensions										Halter Porte-outil Holder
	186	186	D _{min}	l ₁	d ₀	d ₁	a	h	t	l ₀	r	δ	
SDO...	●	●											179...
R Rechte Ausführung* Exécution droite* Right execution*	UHM 20	UHM 20 HX											
SDO 435 092 R	■	■	1	1.5	4	0.92	0.83	0.31	0.23	35	0.02	59°	SDA 4...
SDO 440 092 R	■	■	1	3	4	0.92	0.83	0.31	0.2	40	0.05	59°	SDA 4...
SDO 448 092 R	■	■	1	5	4	0.92	0.83	0.31	0.2	48	0.05	59°	SDA 4...
SDO 435 142 R	■	■	1.5	4.5	4	1.42	1.28	0.47	0.36	35	0.02	59°	SDA 4...
SDO 440 142 R	■	■	1.5	4.5	4	1.42	1.28	0.47	0.4	40	0.08	59°	SDA 4...
SDO 448 142 R	■	■	1.5	7.5	4	1.42	1.28	0.47	0.4	48	0.08	59°	SDA 4...
SDO 435 192 R	■	■	2	6	4	1.92	1.73	0.64	0.48	35	0.03	59°	SDA 4...
SDO 440 192 R	■	■	2	6	4	1.92	1.73	0.64	0.5	40	0.1	59°	SDA 4...
SDO 448 192 R	■	■	2	10	4	1.92	1.73	0.64	0.5	48	0.1	59°	SDA 4...
SDO 435 242 R	■	■	2.5	7.5	4	2.42	2.18	0.81	0.61	35	0.03	59°	SDA 4...
SDO 440 242 R	■	■	2.5	7.5	4	2.42	2.18	0.81	0.6	40	0.13	59°	SDA 4...
SDO 448 242 R	■	■	2.5	12.5	4	2.42	2.18	0.81	0.6	48	0.13	59°	SDA 4...
SDO 440 292 R	■	■	3	9	4	2.92	2.63	0.97	0.7	40	0.15	59°	SDA 4...
SDO 448 292 R	■	■	3	15	4	2.92	2.63	0.97	0.7	48	0.15	59°	SDA 4...
SDO 440 342 R	■	■	3.5	10.5	4	3.42	3.08	1.14	0.9	40	0.18	59°	SDA 4...
SDO 448 342 R	■	■	3.5	17.5	4	3.42	3.08	1.14	0.9	48	0.18	59°	SDA 4...
SDO 440 392 R	■	■	4	12	4	3.92	3.53	1.31	1	40	0.2	59°	SDA 4...
SDO 448 392 R	■	■	4	20	4	3.92	3.53	1.31	1	48	0.2	59°	SDA 4...
SDO 644 442 R	■	■	4.5	9	6	4.42	3.98	1.47	1.1	44	0.23	59°	SDA 6...
SDO 656 442 R	■	■	4.5	18	6	4.42	3.98	1.47	1.1	56	0.23	59°	SDA 6...
SDO 668 442 R	■	■	4.5	27	6	4.42	3.98	1.47	1.1	68	0.23	59°	SDA 6...
SDO 644 492 R	■	■	5	10	6	4.92	4.43	1.64	1.2	44	0.25	59°	SDA 6...
SDO 656 492 R	■	■	5	20	6	4.92	4.43	1.64	1.2	56	0.25	59°	SDA 6...
SDO 668 492 R	■	■	5	30	6	4.92	4.43	1.64	1.2	68	0.25	59°	SDA 6...
SDO 644 542 R	■	■	5.5	11	6	5.42	4.88	1.8	1.4	44	0.28	59°	SDA 6...
SDO 656 542 R	■	■	5.5	22	6	5.42	4.88	1.8	1.4	56	0.28	59°	SDA 6...
SDO 668 542 R	■	■	5.5	33	6	5.42	4.88	1.8	1.4	68	0.28	59°	SDA 6...
SDO 644 592 R	■	■	6	12	6	5.92	5.33	1.97	1.5	44	0.3	59°	SDA 6...
SDO 656 592 R	■	■	6	24	6	5.92	5.33	1.97	1.5	56	0.3	59°	SDA 6...
SDO 668 592 R	■	■	6	36	6	5.92	5.33	1.97	1.5	68	0.3	59°	SDA 6...
SDO 850 692 R	■	■	7	14	8	6.92	6.23	2.3	1.7	50	0.35	59°	SDA 8...
SDO 866 692 R	■	■	7	28	8	6.92	6.23	2.3	1.7	66	0.35	59°	SDA 8...
SDO 882 692 R	■	■	7	42	8	6.92	6.23	2.3	1.7	82	0.35	59°	SDA 8...
SDO 850 792 R	■	■	8	16	8	7.92	7.13	2.64	2	50	0.4	59°	SDA 8...
SDO 866 792 R	■	■	8	32	8	7.92	7.13	2.64	2	66	0.4	59°	SDA 8...
SDO 882 792 R	■	■	8	48	8	7.92	7.13	2.64	2	82	0.4	59°	SDA 8...

* Linke Ausführung und andere Beschichtungen auf Anfrage | Exécution gauche et autres revêtements sur demande | Left execution and other coatings on demand

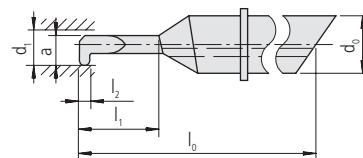
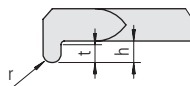
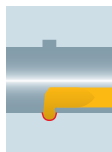
Längsdrehen | Tournage | Turning



Bezeichnung Désignation Designation	Hartmetall Carbure Carbide □ 186		Dimensionen Dimensions Dimensions											Halter Porte-outil Holder
	●	●	D _{min}	l ₁	d ₀	d ₁	a	h	t	l ₀	r	α	β	
SDQ...	○	○												□ 179...
R Rechte Ausführung* Exécution droite* Right execution*	○	○												
	UHM 20	UHM 20 HX												
SDQ 435 092 R	■	■	1	1.5	4	0.92	0.83	0.31	0.23	35	0.02	0.5°	30.5°	SDA 4...
SDQ 440 092 R	■	■	1	3	4	0.92	0.83	0.31	0.2	40	0.05	0.5°	30.5°	SDA 4...
SDQ 448 092 R	■	■	1	5	4	0.92	0.83	0.31	0.2	48	0.05	0.5°	30.5°	SDA 4...
SDQ 435 142 R	■	■	1.5	4.5	4	1.42	1.28	0.47	0.36	35	0.02	0.5°	30.5°	SDA 4...
SDQ 440 142 R	■	■	1.5	4.5	4	1.42	1.28	0.47	0.4	40	0.08	0.5°	30.5°	SDA 4...
SDQ 448 142 R	■	■	1.5	7.5	4	1.42	1.28	0.47	0.4	48	0.08	0.5°	30.5°	SDA 4...
SDQ 435 192 R	■	■	2	6	4	1.92	1.73	0.64	0.48	35	0.03	0.5°	30.5°	SDA 4...
SDQ 440 192 R	■	■	2	6	4	1.92	1.73	0.64	0.5	40	0.1	0.5°	30.5°	SDA 4...
SDQ 448 192 R	■	■	2	10	4	1.92	1.73	0.64	0.5	48	0.1	0.5°	30.5°	SDA 4...
SDQ 435 242 R	■	■	2.5	7.5	4	2.42	2.18	0.81	0.61	35	0.03	0.5°	30.5°	SDA 4...
SDQ 440 242 R	■	■	2.5	7.5	4	2.42	2.18	0.81	0.6	40	0.13	0.5°	30.5°	SDA 4...
SDQ 448 242 R	■	■	2.5	12.5	4	2.42	2.18	0.81	0.6	48	0.13	0.5°	30.5°	SDA 4...
SDQ 440 292 R	■	■	3	9	4	2.92	2.63	0.97	0.7	40	0.15	0.5°	30.5°	SDA 4...
SDQ 448 292 R	■	■	3	15	4	2.92	2.63	0.97	0.7	48	0.15	0.5°	30.5°	SDA 4...
SDQ 440 342 R	■	■	3.5	10.5	4	3.42	3.08	1.14	0.9	40	0.18	0.5°	30.5°	SDA 4...
SDQ 448 342 R	■	■	3.5	17.5	4	3.42	3.08	1.14	0.9	48	0.18	0.5°	30.5°	SDA 4...
SDQ 440 392 R	■	■	4	12	4	3.92	3.53	1.31	1	40	0.2	0.5°	30.5°	SDA 4...
SDQ 448 392 R	■	■	4	20	4	3.92	3.53	1.31	1	48	0.2	0.5°	30.5°	SDA 4...
SDQ 644 442 R	■	■	4.5	9	6	4.42	3.98	1.47	1.1	44	0.23	0.5°	30.5°	SDA 6...
SDQ 656 442 R	■	■	4.5	18	6	4.42	3.98	1.47	1.1	56	0.23	0.5°	30.5°	SDA 6...
SDQ 668 442 R	■	■	4.5	27	6	4.42	3.98	1.47	1.1	68	0.23	0.5°	30.5°	SDA 6...
SDQ 644 492 R	■	■	5	10	6	4.92	4.43	1.64	1.2	44	0.25	0.5°	30.5°	SDA 6...
SDQ 656 492 R	■	■	5	20	6	4.92	4.43	1.64	1.2	56	0.25	0.5°	30.5°	SDA 6...
SDQ 668 492 R	■	■	5	30	6	4.92	4.43	1.64	1.2	68	0.25	0.5°	30.5°	SDA 6...
SDQ 644 542 R	■	■	5.5	11	6	5.42	4.88	1.8	1.4	44	0.28	0.5°	30.5°	SDA 6...
SDQ 656 542 R	■	■	5.5	22	6	5.42	4.88	1.8	1.4	56	0.28	0.5°	30.5°	SDA 6...
SDQ 668 542 R	■	■	5.5	33	6	5.42	4.88	1.8	1.4	68	0.28	0.5°	30.5°	SDA 6...
SDQ 644 592 R	■	■	6	12	6	5.92	5.33	1.97	1.5	44	0.3	0.5°	30.5°	SDA 6...
SDQ 656 592 R	■	■	6	24	6	5.92	5.33	1.97	1.5	56	0.3	0.5°	30.5°	SDA 6...
SDQ 668 592 R	■	■	6	36	6	5.92	5.33	1.97	1.5	68	0.3	0.5°	30.5°	SDA 6...
SDQ 850 692 R	■	■	7	14	8	6.92	6.23	2.3	1.7	50	0.35	0.5°	30.5°	SDA 8...
SDQ 866 692 R	■	■	7	28	8	6.92	6.23	2.3	1.7	66	0.35	0.5°	30.5°	SDA 8...
SDQ 882 692 R	■	■	7	42	8	6.92	6.23	2.3	1.7	82	0.35	0.5°	30.5°	SDA 8...
SDQ 850 792 R	■	■	8	16	8	7.92	7.13	2.64	2	50	0.4	0.5°	30.5°	SDA 8...
SDQ 866 792 R	■	■	8	32	8	7.92	7.13	2.64	2	66	0.4	0.5°	30.5°	SDA 8...
SDQ 882 792 R	■	■	8	48	8	7.92	7.13	2.64	2	82	0.4	0.5°	30.5°	SDA 8...

* Linke Ausführung und andere Beschichtungen auf Anfrage | Exécution gauche et autres revêtements sur demande | Left execution and other coatings on demand

Radius-Einstich | Rainurage-rayonnage | Radius-grooving



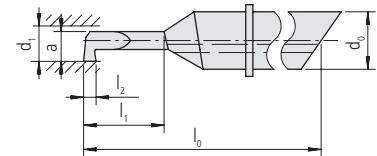
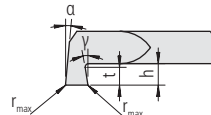
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UTILIS®
Tooling for High Technology

Bezeichnung Désignation Designation	Hartmetall Carbure Carbide □ 186		Dimensionen Dimensions Dimensions											Halter Porte-outil Holder
	●	●	D _{min}	l ₁	d ₀	d ₁	a	h	t	l ₀	l ₂	r		
SDR...	○	○												□ 179...
R Rechte Ausführung* Exécution droite* Right execution*	UHM 20	UHM 20 HX												
SDR 435 092 R UHM20	■	■	1	3	4	0.92	0.83	0.3	0.2	35	0.2	0.1		SDA 4...
SDR 435 142 R UHM20	■	■	1.5	4.5	4	1.42	1.28	0.38	0.25	35	0.25	0.125		SDA 4...
SDR 435 192 R UHM20	■	■	2	6	4	1.92	1.73	0.45	0.3	35	0.3	0.15		SDA 4...
SDR 435 242 R UHM20	■	■	2.5	7.5	4	2.42	2.18	0.53	0.35	35	0.35	0.175		SDA 4...
SDR 440 092 R UHM20	■	■	1	5	4	0.92	0.83	0.3	0.2	40	0.2	0.1		SDA 4...
SDR 440 142 R UHM20	■	■	1.5	7.5	4	1.42	1.28	0.38	0.25	40	0.25	0.125		SDA 4...
SDR 440 192 R UHM20	■	■	2	10	4	1.92	1.73	0.45	0.3	40	0.3	0.15		SDA 4...
SDR 440 242 R UHM20	■	■	2.5	12.5	4	2.42	2.18	0.53	0.35	40	0.35	0.175		SDA 4...
SDR 440 292 R UHM20	■	■	3	15	4	2.92	2.63	0.6	0.4	40	0.4	0.2		SDA 4...
SDR 440 342 R UHM20	■	■	3.5	10.5	4	3.42	3.08	0.68	0.45	40	0.45	0.225		SDA 4...
SDR 440 392 R UHM20	■	■	4	12	4	3.92	3.53	0.75	0.5	40	0.5	0.25		SDA 4...
SDR 448 292 R UHM20	■	■	3	15	4	2.92	2.63	0.6	0.4	48	0.4	0.2		SDA 4...
SDR 448 342 R UHM20	■	■	3.5	17.5	4	3.42	3.08	0.68	0.45	48	0.45	0.225		SDA 4...
SDR 448 392 R UHM20	■	■	4	20	4	3.92	3.53	0.75	0.5	48	0.5	0.25		SDA 4...
SDR 644 442 R UHM20	■	■	4.5	9	6	4.42	3.98	0.83	0.55	44	0.55	0.275		SDA 6...
SDR 644 492 R UHM20	■	■	5	10	6	4.92	4.43	0.9	0.6	44	0.6	0.3		SDA 6...
SDR 644 542 R UHM20	■	■	5.5	11	6	5.42	4.88	0.98	0.65	44	0.65	0.325		SDA 6...
SDR 644 592 R UHM20	■	■	6	12	6	5.92	5.53	1.05	0.7	44	0.7	0.35		SDA 6...
SDR 656 442 R UHM20	■	■	4.5	18	6	4.42	3.98	0.83	0.55	56	0.55	0.275		SDA 6...
SDR 656 492 R UHM20	■	■	5	20	6	4.92	4.43	0.9	0.6	56	0.6	0.3		SDA 6...
SDR 656 542 R UHM20	■	■	5.5	22	6	5.42	4.88	0.98	0.65	56	0.65	0.325		SDA 6...
SDR 656 592 R UHM20	■	■	6	24	6	5.92	5.53	1.05	0.7	56	0.7	0.35		SDA 6...
SDR 668 442 R UHM20	■	■	4.5	27	6	4.42	3.98	0.83	0.55	68	0.55	0.275		SDA 6...
SDR 668 492 R UHM20	■	■	5	30	6	4.92	4.43	0.9	0.6	68	0.6	0.3		SDA 6...
SDR 668 542 R UHM20	■	■	5.5	33	6	5.42	4.88	0.98	0.65	68	0.65	0.325		SDA 6...
SDR 668 592 R UHM20	■	■	6	36	6	5.92	5.53	1.05	0.7	68	0.7	0.35		SDA 6...

* Linke Ausführung und andere Beschichtungen auf Anfrage | Exécution gauche et autres revêtements sur demande | Left execution and other coatings on demand

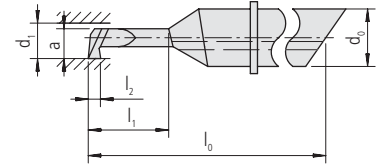
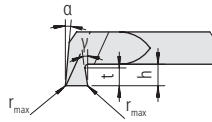
Einstecken | Rainurage | Grooving



Bezeichnung Désignation Designation	Hartmetall Carbure Carbide □ 186		Dimensionen Dimensions Dimensions												Halter Porte-outil Holder
	●	●	D _{min}	l ₁	d ₀	d ₁	a	h	t	l ₀	l ₂	r _{max}	α	γ	
SDS...	○	○													□ 179...
R Rechte Ausführung* Exécution droite* Right execution*	○	○													
	UHM 20	UHM 20 HX													
SDS 435 092 R	■	■	1	1.5	4	0.92	0.83	0.31	0.23	35	0.2	0.02	2°	2°	SDA 4...
SDS 440 092 R	■	■	1	3	4	0.92	0.83	0.31	0.2	40	0.2	0.02	2°	2°	SDA 4...
SDS 448 092 R	■	■	1	5	4	0.92	0.83	0.31	0.2	48	0.2	0.02	2°	2°	SDA 4...
SDS 435 142 R	■	■	1.5	4.5	4	1.42	1.28	0.47	0.36	35	0.25	0.02	2°	2°	SDA 4...
SDS 440 142 R	■	■	1.5	4.5	4	1.42	1.28	0.47	0.4	40	0.25	0.02	2°	2°	SDA 4...
SDS 448 142 R	■	■	1.5	7.5	4	1.42	1.28	0.47	0.4	48	0.25	0.02	2°	2°	SDA 4...
SDS 435 192 R	■	■	2	6	4	1.92	1.73	0.64	0.48	35	0.3	0.02	2°	2°	SDA 4...
SDS 440 192 R	■	■	2	6	4	1.92	1.73	0.64	0.5	40	0.3	0.02	2°	2°	SDA 4...
SDS 448 192 R	■	■	2	10	4	1.92	1.73	0.64	0.5	48	0.3	0.02	2°	2°	SDA 4...
SDS 435 242 R	■	■	2.5	7.5	4	2.42	2.18	0.81	0.61	35	0.35	0.02	2°	2°	SDA 4...
SDS 440 242 R	■	■	2.5	7.5	4	2.42	2.18	0.81	0.6	40	0.35	0.02	2°	2°	SDA 4...
SDS 448 242 R	■	■	2.5	12.5	4	2.42	2.18	0.81	0.6	48	0.35	0.02	2°	2°	SDA 4...
SDS 440 292 R	■	■	3	9	4	2.92	2.63	0.97	0.7	40	0.4	0.02	2°	2°	SDA 4...
SDS 448 292 R	■	■	3	15	4	2.92	2.63	0.97	0.7	48	0.4	0.02	2°	2°	SDA 4...
SDS 440 342 R	■	■	3.5	10.5	4	3.42	3.08	1.14	0.9	40	0.45	0.02	2°	2°	SDA 4...
SDS 448 342 R	■	■	3.5	17.5	4	3.42	3.08	1.14	0.9	48	0.45	0.02	2°	2°	SDA 4...
SDS 440 392 R	■	■	4	12	4	3.92	3.53	1.31	1	40	0.5	0.02	2°	2°	SDA 4...
SDS 448 392 R	■	■	4	20	4	3.92	3.53	1.31	1	48	0.5	0.02	2°	2°	SDA 4...
SDS 644 442 R	■	■	4.5	9	6	4.42	3.98	1.47	1.1	44	1	0.02	2°	2°	SDA 6...
SDS 656 442 R	■	■	4.5	18	6	4.42	3.98	1.47	1.1	56	1	0.02	2°	2°	SDA 6...
SDS 668 442 R	■	■	4.5	27	6	4.42	3.98	1.47	1.1	68	1	0.02	2°	2°	SDA 6...
SDS 644 492 R	■	■	5	10	6	4.92	4.43	1.64	1.2	44	1.5	0.02	2°	2°	SDA 6...
SDS 656 492 R	■	■	5	20	6	4.92	4.43	1.64	1.2	56	1.5	0.02	2°	2°	SDA 6...
SDS 668 492 R	■	■	5	30	6	4.92	4.43	1.64	1.2	68	1.5	0.02	2°	2°	SDA 6...
SDS 644 542 R	■	■	5.5	11	6	5.42	4.88	1.80	1.4	44	1	0.02	2°	2°	SDA 6...
SDS 656 542 R	■	■	5.5	22	6	5.42	4.88	1.80	1.4	56	1	0.02	2°	2°	SDA 6...
SDS 668 542 R	■	■	5.5	33	6	5.42	4.88	1.80	1.4	68	1	0.02	2°	2°	SDA 6...
SDS 644 592 R	■	■	6	12	6	5.92	5.33	1.97	1.5	44	1.5	0.02	2°	2°	SDA 6...
SDS 656 592 R	■	■	6	24	6	5.92	5.33	1.97	1.5	56	1.5	0.02	2°	2°	SDA 6...
SDS 668 592 R	■	■	6	36	6	5.92	5.33	1.97	1.5	68	1.5	0.02	2°	2°	SDA 6...
SDS 850 692 R	■	■	7	14	8	6.92	6.23	2.3	1.7	50	1.5	0.02	2°	2°	SDA 8...
SDS 866 692 R	■	■	7	28	8	6.92	6.23	2.3	1.7	66	1.5	0.02	2°	2°	SDA 8...
SDS 882 692 R	■	■	7	42	8	6.92	6.23	2.3	1.7	82	1.5	0.02	2°	2°	SDA 8...
SDS 850 792 R	■	■	8	16	8	7.92	7.13	2.64	2	50	2	0.02	2°	2°	SDA 8...
SDS 866 792 R	■	■	8	32	8	7.92	7.13	2.64	2	66	2	0.02	2°	2°	SDA 8...
SDS 882 792 R	■	■	8	48	8	7.92	7.13	2.64	2	82	2	0.02	2°	2°	SDA 8...

* Linke Ausführung und andere Beschichtungen auf Anfrage | Exécution gauche et autres revêtements sur demande | Left execution and other coatings on demand

Einstechen und Längsdrehen | Fonçage et tournage | Grooving and turning



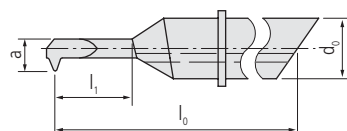
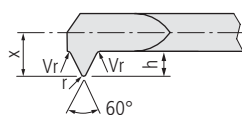
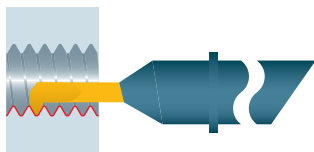
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Bezeichnung Désignation Designation			Hartmetall Carbure Carbide		Dimensionen Dimensions Dimensions											Halter Porte-outil Holder		
					D _{min}	l ₁	d ₀	d ₁	a	h	t	l ₀	l ₂	r _{max}	α	γ		
SDT...																		
R Rechte Ausführung* Exécution droite* Right execution*			UHM 20 ...	HX ...														
SDT 440 392 R					4	12	4	3.92	3.53	1.31	1	40	1	0.02	0°	1.5°		SDA 4...
SDT 448 392 R					4	20	4	3.92	3.53	1.31	1	48	1	0.02	0°	1.5°		SDA 4...
SDT 644 592 R					6	12	6	5.92	5.33	1.97	1.5	44	1.25	0.02	0°	1.5°		SDA 6...
SDT 656 592 R					6	24	6	5.92	5.33	1.97	1.5	56	1.25	0.02	0°	1.5°		SDA 6...
SDT 668 592 R					6	36	6	5.92	5.33	1.97	1.5	68	1.25	0.02	0°	1.5°		SDA 6...
SDT 850 792 R					8	16	8	7.92	7.13	2.64	2	50	1.5	0.02	0°	1.5°		SDA 8...
SDT 866 792 R					8	32	8	7.92	7.13	2.64	2	66	1.5	0.02	0°	1.5°		SDA 8...
SDT 882 792 R					8	48	8	7.92	7.13	2.64	2	82	1.5	0.02	0°	1.5°		SDA 8...

* Linke Ausführung und andere Beschichtungen auf Anfrage | Exécution gauche et autres revêtements sur demande | Left execution and other coatings on demand

Gewindedrehen, Vollprofil | Filetage, profil complet | Threading, full profile

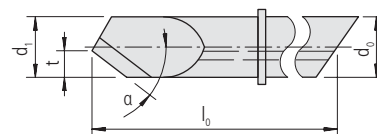


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UTILIS®
Tooling for High Technology

Bezeichnung Désignation Designation	Hartmetall Carbure Carbide □ 186		Dimensionen Dimensions Dimensions											Halter Porte-outil Holder
	●	●	D _{min}	l ₁	d ₀	a	h	x	l ₀	r	Vr	Bereich Gamme Range	Steigung Pas Pitch	
SDV...	○	●												□ 179...
R Rechte Ausführung* Exécution droite* Right execution*	○	○												
	UHM 20	UHM 20 HX												
SDV 435 100 R UHM20	■	■	1	3	4	0.6	0.25	0.5	35	0.02	0.04	M1	0.25	SDA 4...
SDV 435 120 R UHM20	■	■	1.2	3.6	4	0.76	0.25	0.6	35	0.02	0.04	M1.2	0.25	SDA 4...
SDV 435 140 R UHM20	■	■	1.4	4.2	4	0.92	0.3	0.7	35	0.02	0.05	M1.4	0.3	SDA 4...
SDV 435 160 R UHM20	■	■	1.6	4.8	4	1.08	0.35	0.8	35	0.03	0.05	M1.6	0.35	SDA 4...
SDV 435 180 R UHM20	■	■	1.8	5.4	4	1.24	0.35	0.9	35	0.03	0.05	M1.8	0.35	SDA 4...
SDV 435 200 R UHM20	■	■	2	6	4	1.4	0.4	1	35	0.03	0.05	M2.0	0.4	SDA 4...
SDV 435 220 R UHM20	■	■	2.2	6.6	4	1.56	0.45	1.1	35	0.03	0.05	M2.2	0.45	SDA 4...
SDV 435 250 R UHM20	■	■	2.5	7.5	4	1.8	0.45	1.25	35	0.03	0.05	M2.5	0.45	SDA 4...
SDV 440 100 R UHM20	■	■	1	5	4	0.6	0.25	0.5	40	0.02	0.04	M1	0.25	SDA 4...
SDV 440 120 R UHM20	■	■	1.2	6	4	0.76	0.25	0.6	40	0.02	0.04	M1.2	0.25	SDA 4...
SDV 440 140 R UHM20	■	■	1.4	7	4	0.92	0.3	0.7	40	0.02	0.05	M1.4	0.3	SDA 4...
SDV 440 160 R UHM20	■	■	1.6	8	4	1.08	0.35	0.8	40	0.03	0.05	M1.6	0.35	SDA 4...
SDV 440 180 R UHM20	■	■	1.8	9	4	1.24	0.35	0.9	40	0.03	0.05	M1.8	0.35	SDA 4...
SDV 440 200 R UHM20	■	■	2	10	4	1.4	0.4	1	40	0.03	0.05	M2.0	0.4	SDA 4...
SDV 440 220 R UHM20	■	■	2.2	11	4	1.56	0.45	1.1	40	0.03	0.05	M2.2	0.45	SDA 4...
SDV 440 250 R UHM20	■	■	2.5	12.5	4	1.8	0.45	1.25	40	0.03	0.05	M2.5	0.45	SDA 4...
SDV 440 300 R UHM20	■	■	3	9	4	2.2	0.5	1.5	40	0.04	0.06	M3.0	0.5	SDA 4...
SDV 440 350 R UHM20	■	■	3.5	10.5	4	2.6	0.6	1.75	40	0.04	0.06	M3.5	0.6	SDA 4...
SDV 440 400 R UHM20	■	■	4	12	4	3	0.7	1.2	40	0.05	0.06	M4.0	0.7	SDA 4...
SDV 448 300 R UHM20	■	■	3	15	4	2.2	0.5	1.5	48	0.04	0.06	M3.0	0.5	SDA 4...
SDV 448 350 R UHM20	■	■	3.5	17.5	4	2.6	0.6	1.75	48	0.04	0.06	M3.5	0.6	SDA 4...
SDV 448 400 R UHM20	■	■	4	20	4	3	0.7	1.2	48	0.05	0.06	M4.0	0.7	SDA 4...

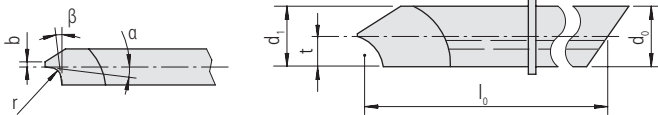
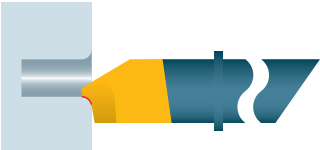
* Linke Ausführung und andere Beschichtungen auf Anfrage | Exécution gauche et autres revêtements sur demande | Left execution and other coatings on demand



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide  186		Dimensionen Dimensions Dimensions											Halter Porte-outil Holder
				d ₀	d ₁	t	l ₀	α							
															
															
SDY...															 179...
 R	Rechte Ausführung* Exécution droite* Right execution*	UHM 20 ... 	UHM 20 HX ... 												
SDY 440 400-30 R				4	4	1.75	40	30°							SDA 4...
SDY 440 400-45 R				4	4	1.75	40	45°							SDA 4...
SDY 440 400-60 R				4	4	1.75	40	60°							SDA 4...
SDY 644 600-30 R				6	6	2.75	44	30°							SDA 6...
SDY 644 600-45 R				6	6	2.75	44	45°							SDA 6...
SDY 644 600-60 R				6	6	2.75	44	60°							SDA 6...

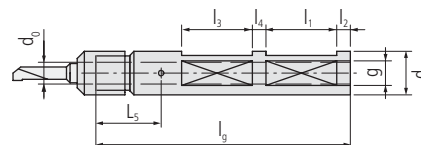
* Linke Ausführung und andere Beschichtungen auf Anfrage | Exécution gauche et autres revêtements sur demande | Left execution and other coatings on demand

Fasen | Chanfreinage | Chamfering



Bezeichnung Désignation Designation	Hartmetall Carbure Carbide		Dimensionen Dimensions Dimensions													Halter Porte-outil Holder
			d ₀	d ₁	b	t	l ₀	r	a	β						
SDZ...																179...
Rechte Ausführung* Exécution droite* Right execution*	UHM 20	UHM 20 HX														
SDZ 440 400-03 R			4	4	0.4	1.75	40	0.3	7°	7°						SDA 4...
SDZ 440 400-05 R			4	4	0.4	1.75	40	0.5	7°	7°						SDA 4...
SDZ 440 400-10 R			4	4	0.4	1.75	40	1	7°	7°						SDA 4...
SDZ 644 600-05 R			6	6	0.6	2.75	44	0.5	7°	7°						SDA 6...
SDZ 644 600-10 R			6	6	0.6	2.75	44	1	7°	7°						SDA 6...
SDZ 644 600-15 R			6	6	0.6	2.75	44	1.5	7°	7°						SDA 6...

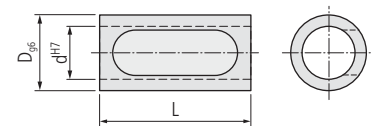
* Linke Ausführung und andere Beschichtungen auf Anfrage | Exécution gauche et autres revêtements sur demande | Left execution and other coatings on demand



Bezeichnung Désignation Designation			Dimensionen Dimensions Dimensions										Schneiden Grains Inserts	
SDA...				d ₀	d ₁	g	l _g	l ₁	l ₂	l ₃	l ₄	l ₅	164...	
L	N	R	Linke, neutrale und rechte Ausführung Exécution gauche, neutre et droite Left, neutral and right execution											
●	●	●	SDA 4 060 07	■	4	7	M5	60	—	—	—	—	21	SD.4..
●	●	●	SDA 4 060 08	■	4	8	M5	60	27	5	—	—	21	SD.4..
●	●	●	SDA 4 060 10	■	4	10	M5	60	27	5	—	—	21	SD.4..
●	●	●	SDA 4 060 12	■	4	12	R 1/8"	60	27	5	—	—	21	SD.4..
●	●	●	SDA 4 060 12.7	■	4	12.7	R 1/8"	60	27	5	—	—	21	SD.4..
●	●	●	SDA 4 060 14	□	4	14	R 1/8"	60	27	5	—	—	21	SD.4..
●	●	●	SDA 4 060 16	■	4	16	R 1/8"	60	27	5	—	—	21	SD.4..
●	●	●	SDA 4 060 18	□	4	18	R 1/8"	60	27	5	—	—	21	SD.4..
●	●	●	SDA 4 060 19.05	■	4	19.05	R 1/8"	60	27	5	—	—	21	SD.4..
●	●	●	SDA 4 060 20	■	4	20	R 1/8"	60	27	5	—	—	21	SD.4..
●	●	●	SDA 4 060 22	■	4	22	R 1/8"	60	27	5	—	—	21	SD.4..
●	●	●	SDA 4 060 25	■	4	25	R 1/8"	60	27	5	—	—	21	SD.4..
●	●	●	SDA 4 060 25,40	■	4	25.4	R 1/8"	60	27	5	—	—	21	SD.4..
●	●	●	SDA 4 060 28	□	4	28	R 1/8"	60	27	5	—	—	21	SD.4..
●	●	●	SDA 4 100 08	□	4	8	R 1/8"	100	27	5	—	—	21	SD.4..
●	●	●	SDA 4 100 10	□	4	10	R 1/8"	100	27	5	—	—	21	SD.4..
●	●	●	SDA 4 120 12	■	4	12	R 1/8"	120	27	5	27	5	21	SD.4..
●	●	●	SDA 4 120 12,7	□	4	12.7	R 1/8"	120	27	5	27	5	21	SD.4..
●	●	●	SDA 4 120 14	□	4	14	R 1/8"	120	27	5	27	5	21	SD.4..
●	●	●	SDA 4 120 16	■	4	16	R 1/8"	120	27	5	27	5	21	SD.4..
●	●	●	SDA 4 120 18	□	4	18	R 1/8"	120	27	5	27	5	21	SD.4..
●	●	●	SDA 4 120 19.05	■	4	19.05	R 1/8"	120	27	5	27	5	21	SD.4..
●	●	●	SDA 4 120 20	■	4	20	R 1/8"	120	27	5	27	5	21	SD.4..
●	●	●	SDA 4 175 20	□	4	20	R 1/8"	175	27	5	27	5	21	SD.4..
●	●	●	SDA 4 120 22	■	4	22	R 1/8"	120	27	5	27	5	21	SD.4..
●	●	●	SDA 4 120 25	■	4	25	R 1/8"	120	27	5	27	5	21	SD.4..
●	●	●	SDA 4 120 25,4	■	4	25.4	R 1/8"	120	27	5	27	5	21	SD.4..
●	●	●	SDA 4 120 28	■	4	28	R 1/8"	120	27	5	27	5	21	SD.4..
●	●	●	SDA 6 065 12	■	6	12	R 1/8"	65	27	5	—	—	24	SD.6..
●	●	●	SDA 6 065 12.7	□	6	12.7	R 1/8"	65	27	5	—	—	24	SD.6..
●	●	●	SDA 6 065 14	□	6	14	R 1/8"	65	27	5	—	—	24	SD.6..
●	●	●	SDA 6 065 16	■	6	16	R 1/8"	65	27	5	—	—	24	SD.6..
●	●	●	SDA 6 065 18	□	6	18	R 1/8"	65	27	5	—	—	24	SD.6..
●	●	●	SDA 6 065 19.05	■	6	19.05	R 1/8"	65	27	5	—	—	24	SD.6..
●	●	●	SDA 6 065 20	■	6	20	R 1/8"	65	27	5	—	—	24	SD.6..
●	●	●	SDA 6 065 22	■	6	22	R 1/8"	65	27	5	—	—	24	SD.6..
●	●	●	SDA 6 065 25	■	6	25	R 1/8"	65	27	5	—	—	24	SD.6..
●	●	●	SDA 6 065 25,4	■	6	25.4	R 1/8"	65	27	5	—	—	24	SD.6..
●	●	●	SDA 6 065 28	□	6	28	R 1/8"	65	27	5	—	—	24	SD.6..
●	●	●	SDA 6 100 12	■	6	12	R 1/8"	100	27	5	—	—	24	SD.6..
●	●	●	SDA 6 120 12,7	□	6	12.7	R 1/8"	120	27	5	27	5	24	SD.6..

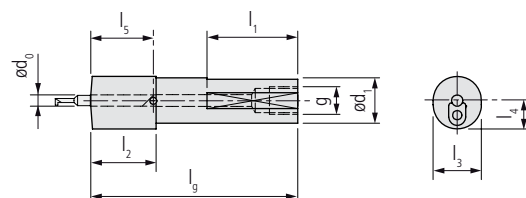
Bezeichnung Désignation Designation					Dimensionen Dimensions Dimensions										Schneiden Grains Inserts
					d ₀	d ₁	g	l _g	l ₁	l ₂	l ₃	l ₄	l ₅		
SDA...															📄 164...
L N R Linke, neutrale und rechte Ausführung Exécution gauche, neutre et droite Left, neutral and right execution															
●	●	●	SDA 6 120 14	□	6	14	R 1/8"	120	27	5	27	5	24	SD.6...	
●	●	●	SDA 6 120 16	■	6	16	R 1/8"	120	27	5	27	5	24	SD.6...	
●	●	●	SDA 6 120 18	□	6	18	R 1/8"	120	27	5	27	5	24	SD.6...	
●	●	●	SDA 6 120 19.05	■	6	19.05	R 1/8"	120	27	5	27	5	24	SD.6...	
●	●	●	SDA 6 120 20	■	6	20	R 1/8"	120	27	5	27	5	24	SD.6...	
●	●	●	SDA 6 120 22	■	6	22	R 1/8"	120	27	5	27	5	24	SD.6...	
●	●	●	SDA 6 120 25	■	6	25	R 1/8"	120	27	5	27	5	24	SD.6...	
●	●	●	SDA 6 120 25.40	■	6	25.4	R 1/8"	120	27	5	27	5	24	SD.6...	
●	●	●	SDA 6 120 28	■	6	28	R 1/8"	120	27	5	27	5	24	SD.6...	
●	●	●	SDA 8 070 14	■	8	14	R 1/8"	70	27	5	—	—	26	SD.8...	
●	●	●	SDA 8 070 16	■	8	16	R 1/8"	70	27	5	—	—	26	SD.8...	
●	●	●	SDA 8 070 19.05	■	8	19.05	R 1/8"	70	27	5	—	—	26	SD.8...	
●	●	●	SDA 8 070 20	■	8	20	R 1/8"	70	27	5	—	—	26	SD.8...	
●	●	●	SDA 8 070 22	■	8	22	R 1/8"	70	27	5	—	—	26	SD.8...	
●	●	●	SDA 8 070 25	■	8	25	R 1/8"	70	27	5	—	—	26	SD.8...	
●	●	●	SDA 8 070 25,4	■	8	25.40	R 1/8"	70	27	5	—	—	26	SD.8...	
●	●	●	SDA 8 070 28	□	8	28	R 1/8"	70	27	5	—	—	26	SD.8...	
●	●	●	SDA 8 100 14	□	8	14	R 1/8"	100	27	5	—	—	26	SD.8...	
●	●	●	SDA 8 120 16	■	8	16	R 1/8"	120	27	5	27	5	26	SD.8...	
●	●	●	SDA 8 120 18	□	8	18	R 1/8"	120	27	5	27	5	26	SD.8...	
●	●	●	SDA 8 120 19.05	■	8	19.05	R 1/8"	120	27	5	27	5	26	SD.8...	
●	●	●	SDA 8 120 20	■	8	20	R 1/8"	120	27	5	27	5	26	SD.8...	
●	●	●	SDA 8 120 22	■	8	22	R 1/8"	120	27	5	27	5	26	SD.8...	
●	●	●	SDA 8 120 25	■	8	25	R 1/8"	120	27	5	27	5	26	SD.8...	
●	●	●	SDA 8 120 25.40	□	8	25.40	R 1/8"	120	27	5	27	5	26	SD.8...	
●	●	●	SDA 8 120 28	■	8	28	R 1/8"	120	27	5	27	5	26	SD.8...	

REDUZIERHÜLSE
DOUILLE DE RÉDUCTION
REDUCTION SLEEVE



Bezeichnung Désignation Designation		Dimensionen Dimensions Dimensions									
		d _{H7}	D _{g6}	L							
MRH...											
MRH 1600 1230	■	12	16	30							
MRH 1905 1240	■	12	19.05	40							
MRH 2200 1240	■	12	22	40							
MRH 2540 1240	■	12	25.4	40							
MRH 1905 1640	■	16	19.05	40							
MRH 2200 1640	■	16	22	40							
MRH 2540 1640	■	16	25.4	40							
MRH 15875 1230	■	12	15.875	30							

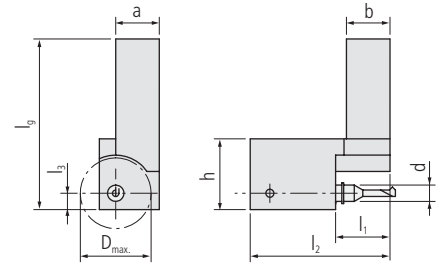
Superclamp



Bezeichnung Désignation Designation	Ausführung Exécution Execution			Dimensionen Dimensions Dimensions									Schneiden Grains Inserts
	L	N	R	ød ₀	ød ₁	g	l _g	l ₁	l ₂	l ₃	l ₄	l ₅	
SDA 4...SC													
SDA 4 073 050 07 SC		■		4	7	M5	73	32	23	9	10	22.5	SD.4...
SDA 4 073 050 08 SC		■		4	8	M5	73	32	23	9	10	22.5	SD.4...
SDA 4 073 050 10 SC		■		4	10	M5	73	32	23	11	10	22.5	SD.4...
SDA 4 073 050 12 SC		■		4	12	G1/8"	73	32	23	13	10	22.5	SD.4...
SDA 4 073 050 12.7 SC		■		4	12.7	G1/8"	73	32	23	13	10	22.5	SD.4...
SDA 4 073 050 16 SC		■		4	16	G1/8"	73	32	23	17	10	22.5	SD.4...
SDA 4 073 050 19.05 SC		■		4	19.05	G1/8"	73	32	23	20	10	22.5	SD.4...
SDA 4 073 000 20 SC		■		4	20	G1/8"	73	32	—	20	10	22.5	SD.4...
SDA 4 133 110 19.05 SC		■		4	19.05	G1/8"	133	64	23	20	10	22.5	SD.4...
SDA 4 133 000 25.40 SC		■		4	25.4	G1/8"	133	64	—	25.4	12.7	22.5	SD.4...

Bezeichnung Désignation Designation	Ausführung Exécution Execution			Dimensionen Dimensions Dimensions								Schneiden Grains Inserts	
	L	N	R	ød ₀	ød ₁	g	l _g	l ₁	l ₂	l ₃	l ₄		l ₅
SDA 6...SC													
SDA 6 078 055 12 SC		■		6	12	G1/8"	78	32	23	13	11.2	26.2	SD.6...
SDA 6 078 055 12.7 SC		■		6	12.7	G1/8"	78	32	23	13	11.2	26.2	SD.6...
SDA 6 078 055 16 SC		■		6	16	G1/8"	78	32	23	17	11.2	26.2	SD.6...
SDA 6 078 055 19.05 SC		■		6	19.05	G1/8"	78	32	23	20	11.2	26.2	SD.6...
SDA 6 078 055 20 SC		■		6	20	G1/8"	78	32	23	20	11.2	26.2	SD.6...
SDA 6 133 110 19.05 SC		■		6	19.05	G1/8"	133	64	23	20	11.2	26.2	SD.6...
SDA 6 133 000 22 SC		■		6	22	G1/8"	133	64	—	22	11.5	26.2	SD.6...

Bezeichnung Désignation Designation	Ausführung Exécution Execution			Dimensionen Dimensions Dimensions									Schneiden Grains Inserts
	L	N	R	ød ₀	ød ₁	g	l _g	l ₁	l ₂	l ₃	l ₄	l ₅	
SDA 8...SC													
SDA 8 083 060 14 SC		■		8	14	G1/8"	83	32	23	17	12.3	27.9	SD.8...
SDA 8 083 060 16 SC		■		8	16	G1/8"	83	32	23	17	12.3	27.9	SD.8...
SDA 8 083 060 19.05 SC		■		8	19.05	G1/8"	83	32	23	20	12.3	27.9	SD.8...
SDA 8 083 060 20 SC		■		8	20	G1/8"	83	32	23	20	12.3	27.9	SD.8...



Bezeichnung Désignation Designation					Dimensionen Dimensions Dimensions										Schneiden Grains Inserts	
AKR...					a	b	D _{max}	h	d	l _g	l ₁	l ₂	l ₃		□ 164...	
L	N	R	Linke, neutrale und rechte Ausführung Exécution gauche, neutre et droite Left, neutral and right execution													
●	●	●	AKR 0808x96 D04		■	8	8	26	26	4	96	20	50	6	SD.4.. ...	
●	●	●	AKR 1010x96 D04		■	10	10	26	26	4	96	20	50	6	SD.4.. ...	
●	●	●	AKR 1212x96 D04		■	12	12	26	26	4	96	20	50	6	SD.4.. ...	
●	●	●	AKR 1/2"x96 D04		□	12.7	12.7	26	26	4	96	20	50	6	SD.4.. ...	
●	●	●	AKR 1616x96 D04		■	16	16	26	26	4	96	20	50	6	SD.4.. ...	
●	●	●	AKR 1010x96 D06		■	10	10	26	26	6	96	20	52	6	SD.6.. ...	
●	●	●	AKR 1212x96 D06		■	12	12	26	26	6	96	20	52	6	SD.6.. ...	
●	●	●	AKR 1/2"x96 D06		□	12.7	12.7	26	26	6	96	20	52	6	SD.6.. ...	
●	●	●	AKR 1616x96 D06		■	16	16	28	26	6	96	20	52	6	SD.6.. ...	
●	●	●	AKR 1212x97 D08		■	12	12	26	27	8	97.2	24.5	60	7.2	SD.8.. ...	
●	●	●	AKR 1616x97 D08		■	16	16	28	27	8	97.2	24.5	60	7.2	SD.8.. ...	

SDA...

Abbildung Illustration Illustration	Bezeichnung Désignation Designation	Beschreibung Description Description	Dimensionen Dimensions Dimensions	Schneiden Grains Inserts	Halter Porte-outil Holder
				□ 164...	□ 179...
	MSP SDA 4M	Überwurfmutter Écrou fileté Nut	M8×0.5		SDA 4...
	MSP SDA 6M		M12×0.6		SDA 6...
	MSP SDA 8M		M14×0.75		SDA 8...
	SDA 4X	Ausrichthilfe Outil d'ajustage Aligning device			SDA 4...
	SDA 6X				SDA 6...
	SDA 8X				SDA 8...
	MSP SDA 4S	Sicherungsringe Circlips Retaining ring		SD. 4...	
	MSP SDA 6S			SD. 6...	
	MSP SDA 8S			SD. 8...	

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SDA ...SC

Abbildung Illustration Illustration	Bezeichnung Désignation Designation	Beschreibung Description Description	Dimensionen Dimensions Dimensions	Halter Porte-outil Holder
				□ 179...
	MSP 40150 T08	Gewindestift links/rechts Goujon fileté Grub screw	M4×15 L/R	SDA ...SC
	MSP SDA DS	Druckstück Pièce de serrage Thrust piece		SDA ...SC
	MSP TX08	Torxschlüssel Tournevis torx Torx screwdriver		SDA ...SC

AKR ...

Abbildung Illustration Illustration	Bezeichnung Désignation Designation	Beschreibung Description Description	Dimensionen Dimensions Dimensions	Halter Porte-outil Holder
				□ 179...
	MSP 80250 S IB4	Klemmschraube Vis de serrage Clamping screw	M8x25 Special	AKR ...
	MSP 50120 DR	Druckstück Pièce de serrage Thrust piece		AKR ...
	MSP 40070 AN D04	Anschlag Buttée Stop-Pin		AKR ...D04
	MSP 60075 AN D06			AKR ...D06
	MSP 30030 IB1.5	Klemmschraube Vis de serrage Clamping screw	M3x3	AKR ...

SDG – SDI – SDY – SDZ

	Stahl unlegiert Acier non allié Steel unalloyed		Stahl niedriglegiert Acier faibl. allié Steel low alloyed		Stahl hochlegiert Acier fortem. allié Steel high alloyed		Rostfreier Stahl Acier inoxydable Stainless steel		Titan Titane Titanium		Aluminium Aluminium Aluminium		Messing Laiton Brass	
D (mm)	f (mm)	a _p (mm)	f (mm)	a _p (mm)	f (mm)	a _p (mm)	f (mm)	a _p (mm)	f (mm)	a _p (mm)	f (mm)	a _p (mm)	f (mm)	a _p (mm)
1	0.01– 0.02	0.1– 0.2	0.01– 0.017	0.1– 0.17	0.007– 0.017	0.07– 0.17	0.007– 0.017	0.07– 0.17	0.006– 0.02	0.06– 0.2	0.01– 0.025	0.1– 0.25	0.01– 0.025	0.1– 0.25
2	0.012– 0.022	0.12– 0.22	0.012– 0.02	0.12– 0.2	0.008– 0.018	0.08– 0.18	0.008– 0.018	0.08– 0.18	0.008– 0.02	0.08– 0.2	0.015– 0.03	0.15– 0.3	0.015– 0.03	0.15– 0.3
3	0.015– 0.025	0.15– 0.25	0.014– 0.024	0.14– 0.24	0.009– 0.019	0.09– 0.19	0.009– 0.019	0.09– 0.19	0.01– 0.02	0.1– 0.2	0.015– 0.035	0.15– 0.35	0.015– 0.035	0.15– 0.35
4	0.015– 0.027	0.15– 0.27	0.015– 0.025	0.15– 0.25	0.01– 0.02	0.1– 0.2	0.01– 0.02	0.1– 0.2	0.01– 0.02	0.1– 0.2	0.015– 0.035	0.15– 0.35	0.015– 0.035	0.15– 0.35
5	0.015– 0.03	0.15– 0.3	0.015– 0.025	0.15– 0.25	0.01– 0.02	0.1– 0.2	0.01– 0.02	0.1– 0.2	0.01– 0.025	0.1– 0.25	0.015– 0.04	0.15– 0.4	0.015– 0.04	0.15– 0.4
6	0.015– 0.03	0.15– 0.3	0.015– 0.025	0.15– 0.25	0.01– 0.02	0.1– 0.2	0.01– 0.02	0.1– 0.2	0.01– 0.025	0.1– 0.25	0.015– 0.05	0.15– 0.5	0.015– 0.04	0.15– 0.4

SDK – SDM – SDO – SDQ – SDT

	Stahl unlegiert Acier non allié Steel unalloyed		Stahl niedriglegiert Acier faibl. allié Steel low alloyed		Stahl hochlegiert Acier fortem. allié Steel high alloyed		Rostfreier Stahl Acier inoxydable Stainless steel		Titan Titane Titanium		Aluminium Aluminium Aluminium		Messing Laiton Brass	
D (mm)	f (mm)	a _p (mm)	f (mm)	a _p (mm)	f (mm)	a _p (mm)	f (mm)	a _p (mm)	f (mm)	a _p (mm)	f (mm)	a _p (mm)	f (mm)	a _p (mm)
1	0.01– 0.02	0.1– 0.2	0.01– 0.017	0.1– 0.17	0.007– 0.015	0.07– 0.15	0.007– 0.015	0.07– 0.15	0.006– 0.012	0.06– 0.12	0.007– 0.012	0.07– 0.12	0.007– 0.012	0.07– 0.12
2	0.01– 0.022	0.1– 0.22	0.01– 0.02	0.1– 0.2	0.008– 0.017	0.08– 0.17	0.008– 0.017	0.08– 0.17	0.008– 0.015	0.08– 0.15	0.01– 0.015	0.1– 0.15	0.01– 0.015	0.1– 0.15
3	0.01– 0.025	0.1– 0.25	0.01– 0.022	0.1– 0.22	0.009– 0.02	0.09– 0.2	0.009– 0.02	0.09– 0.2	0.008– 0.017	0.08– 0.17	0.01– 0.02	0.1– 0.2	0.01– 0.02	0.1– 0.2
4	0.01– 0.025	0.1– 0.25	0.01– 0.025	0.1– 0.25	0.01– 0.022	0.1– 0.22	0.01– 0.022	0.1– 0.22	0.008– 0.02	0.08– 0.2	0.01– 0.025	0.1– 0.25	0.01– 0.025	0.1– 0.25
5	0.01– 0.025	0.1– 0.25	0.01– 0.025	0.1– 0.25	0.01– 0.025	0.1– 0.25	0.01– 0.025	0.1– 0.25	0.008– 0.02	0.08– 0.2	0.01– 0.03	0.1– 0.3	0.01– 0.03	0.1– 0.3
6	0.01– 0.025	0.1– 0.25	0.01– 0.025	0.1– 0.25	0.01– 0.025	0.1– 0.25	0.01– 0.025	0.1– 0.25	0.008– 0.02	0.08– 0.2	0.01– 0.035	0.1– 0.35	0.01– 0.03	0.1– 0.3

SDR – SDS

	Stahl unlegiert Acier non allié Steel unalloyed	Stahl niedriglegiert Acier faibl. allié Steel low alloyed	Stahl hochlegiert Acier fortem. allié Steel high alloyed	Rostfreier Stahl Acier inoxydable Stainless steel	Titan Titane Titanium	Aluminium Aluminium Aluminium	Messing Laiton Brass
	f (mm)	f (mm)	f (mm)	f (mm)	f (mm)	f (mm)	f (mm)
	0.007–0.020	0.005–0.015	0.005–0.015	0.005–0.015	0.005–0.015	0.007–0.020	0.007–0.020

SDU – SDV

	Stahl unlegiert Acier non allié Steel unalloyed	Stahl niedriglegiert Acier faibl. allié Steel low alloyed	Stahl hochlegiert Acier fortem. allié Steel high alloyed	Rostfreier Stahl Acier inoxydable Stainless steel	Titan Titane Titanium	Aluminium Aluminium Aluminium	Messing Laiton Brass
	a _p (mm)	a _p (mm)	a _p (mm)	a _p (mm)	a _p (mm)	a _p (mm)	a _p (mm)
	0.07–0.20	0.05–0.15	0.05–0.15	0.05–0.15	0.05–0.15	0.07–0.20	0.07–0.20

Vorschübe (f) und Schnitttiefen (a_p) | Avances (f) et profondeurs de passes (a_p) | Feed (f) and depths of cut (a_p)

Werkstoffe | Matières | Materials

	Stahl unlegiert Acier non allié Steel unalloyed			Stahl niedriglegiert Acier faibl. allié Steel low alloyed			Stahl hochlegiert Acier fortem. allié Steel high alloyed			Titan Titane Titanium		
Härte (HB) Dureté (HB) Hardness value (HB)	125–300			180–250			200–350			–		
Kategorie Catégorie Category	I			II			III			IV		
Bearbeitung Usinage Machining method	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼

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Schnittgeschwindigkeiten (v_c) | Vitesses de coupe (v_c) | Cutting speeds (v_c)

	v _c (m/min)			v _c (m/min)			v _c (m/min)			v _c (m/min)		
Schneidstoff Hartmetall Matériaux de coupe carbure Cutting material carbide												
UHM 20	–	–	20–120	–	–	20–100	–	–	20–90	–	–	20–70
UHM 20 SX	–	–	30–140	–	–	30–120	–	–	30–110	–	–	30–80
UHM 20 HX	–	–	30–160	–	–	30–140	–	–	30–130	–	–	30–100

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Werkstoffe | Matières | Materials

	Rostfreier Stahl Acier inoxydable Stainless steel			Rostfreier Stahl Acier inoxydable Stainless steel			Aluminium Aluminium Aluminium			Messing Laiton Brass		
Härte (HB) Dureté (HB) Hardness value (HB)	180–220			220–330			60–130			–		
Kategorie Catégorie Category	V			VI			VII			VIII		
Bearbeitung Usinage Machining method	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼

Schnittgeschwindigkeiten (v_c) | Vitesses de coupe (v_c) | Cutting speeds (v_c)

	v _c (m/min)			v _c (m/min)			v _c (m/min)			v _c (m/min)		
Schneidstoff Hartmetall Matériaux de coupe carbure Cutting material carbide												
UHM 20	–	–	20–80	–	–	20–60	–	–	50–220	–	–	30–110
UHM 20 SX	–	–	30–100	–	–	30–80	–	–	60–300	–	–	50–150
UHM 20 HX	–	–	30–120	–	–	30–100	–	–	60–350	–	–	50–180

Vorschübe (f) und Schnitttiefen (a_p) | Avances (f) et profondeurs de passes (a_p) | Feed (f) and depths of cut (a_p) □ 184

ANWENDUNGSBEREICHE DER SCHNEIDSTOFFSORTEN
DOMAINES D'APPLICATIONS DES MATÉRIAUX DE COUPE
APPLICATION RANGE OF CUTTING GRADES

MULTIDEC®-BORE MICRO

Sorte Nuance Grade	Normbezeichnung Norme Norm	Zähigkeit des Schneidstoffs Tenacité du matériau de coupe Toughness of cutting grades	Härte (HB) Dureté (HB) Hardness value (HB)								Werkstoffe (Kategorie) Matières (Catégorie) Materials (Category)							
											125 – 300	180 – 250	200 – 350		180 – 220	220 – 330	60 – 130	
											Stahl unlegiert Acier non allié Steel non-alloyed (I)	Stahl niedrig legiert Acier faibl. allié Steel low alloyed (II)	Stahl hochlegiert Acier fortem. allié Steel high alloyed (III)	Titan Titane Titanium (IV)	Rostfreier Stahl Acier inoxydable Stainless steel (V)	Rostfreier Stahl Acier inoxydable Stainless steel (VI)	Aluminium Aluminium Aluminium (VII)	Messing Laiton Brass (VIII)
			01	05	10	15	20	25	30	35	40	45	50					
Hartmetall Carbure Carbide																		
UHM 20	K 20/M 20													●	○	○	○	○
UHM 20 HX	K 20/M 20													●	●	●	○	○

MULTIDEC®-EASY BORE

Kurzbeschreibung Gamme de produits Product line		189																								
Anwendungen Innendrehen Applications pour le tournage intérieur Application ID turning		190																								
Schneiden Plaquettes Inserts		192																								
Halter Porte-outils Holders		209																								
Ersatzteile Pièces de rechange Spare parts		211																								
Schnittdaten Données de coupe Cutting specification	<table><tr><th></th><th>Gold-schleifer avec vitre 90° haut sautoige</th><th>Gold-schleifer avec vitre 90° haut sautoige</th><th>Gold-schleifer avec vitre 90° haut sautoige</th><th>Gold-schleifer avec vitre 90° haut sautoige</th><th>Gold-schleifer avec vitre 90° haut sautoige</th></tr><tr><td>Werkzeugtyp avec vitre 90° haut sautoige</td><td>125 – 200</td><td>150 – 250</td><td>200 – 250</td><td>–</td><td>–</td></tr><tr><td>Werkzeugtyp avec vitre 90° haut sautoige</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr><tr><td>Werkzeugtyp avec vitre 90° haut sautoige</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr></table>		Gold-schleifer avec vitre 90° haut sautoige	Gold-schleifer avec vitre 90° haut sautoige	Gold-schleifer avec vitre 90° haut sautoige	Gold-schleifer avec vitre 90° haut sautoige	Gold-schleifer avec vitre 90° haut sautoige	Werkzeugtyp avec vitre 90° haut sautoige	125 – 200	150 – 250	200 – 250	–	–	Werkzeugtyp avec vitre 90° haut sautoige	1	2	3	4	5	Werkzeugtyp avec vitre 90° haut sautoige	✓	✓	✓	✓	✓	212
	Gold-schleifer avec vitre 90° haut sautoige	Gold-schleifer avec vitre 90° haut sautoige	Gold-schleifer avec vitre 90° haut sautoige	Gold-schleifer avec vitre 90° haut sautoige	Gold-schleifer avec vitre 90° haut sautoige																					
Werkzeugtyp avec vitre 90° haut sautoige	125 – 200	150 – 250	200 – 250	–	–																					
Werkzeugtyp avec vitre 90° haut sautoige	1	2	3	4	5																					
Werkzeugtyp avec vitre 90° haut sautoige	✓	✓	✓	✓	✓																					
Anwendungsbereiche der Schneidstoffsorten Domaines d'applications des matériaux de coupe Application range of cutting grades		214																								

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Multidec®-Easy Bore ist ein einschneidiges Drehwerkzeug im Bereich ab 7.8 mm Durchmesser, das durch seine hohe Austauschbarkeit besticht.

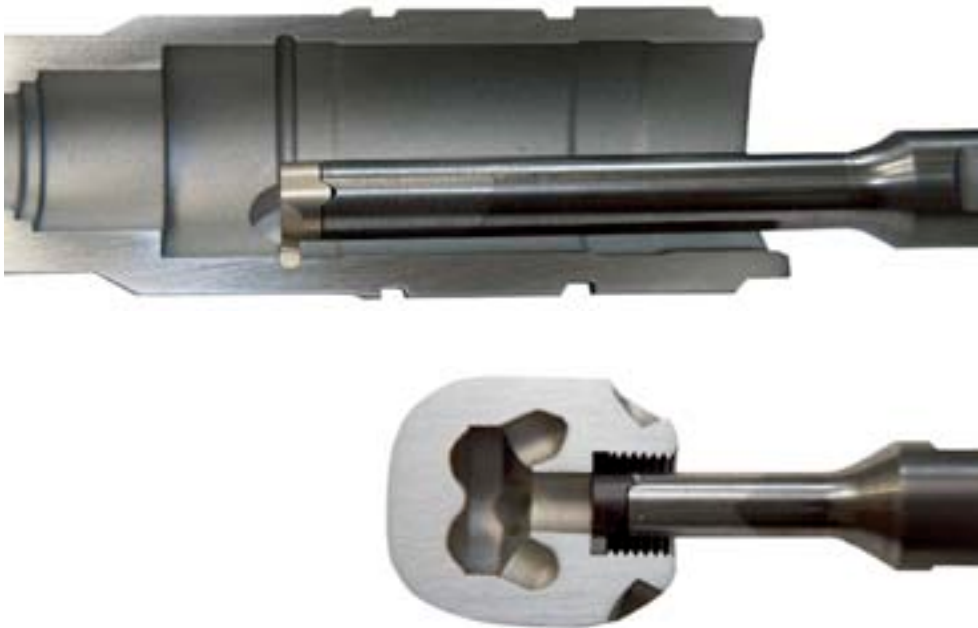
Für eine bessere Leistung sind die HM-Schneideinsätze mit einer TiAlN-Beschichtung (HX) erhältlich. Sie werden stirnseitig mit dem Schaft verschraubt. Für eine einfachste Handhabung wird dazu eine bewährte 3-Rippenverzahnung verwendet. Die Klemmhalter können sowohl mit schwingungsarmem HM-Schaft als auch mit Stahlhaltern geliefert werden. Bis zu einer Ausraglänge von 80 mm besitzen sie eine innere Kühlmittelzufuhr.

Multidec®-Easy Bore est un outil de tournage intérieur au diamètre de travail minimal de 7.8 mm, interchangeable avec plusieurs géométries de coupe.

Pour une augmentation de la durée de vie de l'outil, les pastilles carbure sont également disponibles avec un revêtement TiAlN (HX). Interchangeabilité aisée grâce à l'autocentrage des pastilles carbure sur le porte pastille et ceux-ci sont livrables en carbure ou en acier. Pour les longueurs utiles jusqu'à 80 mm, l'arrosage central est intégré.

Multidec®-Easy Bore is a one-edged cutting tool with the application range beginning from diameter 7.8 mm. It also impresses by his exchangeability. High performance TiAlN (HX) coated inserts are available.

Highly qualified inserts affix the end of the holder and can be changed by use of a simple screwdriver. Three positive ribs on the carbide insert ensure accurate locating within the holder. The holders are available with low vibration carbide or steel shank. All holders under 80 mm in length feature internal coolant delivery.



Vorteile

- Drehen ab Ø 7.8 mm
- Hohe Flexibilität durch Austauschbarkeit
- Einfache Handhabung durch Schnittstelle mit 3-Rippenverzahnung
- Innenkühlung bis Ausraglänge von 80 mm

Avantages

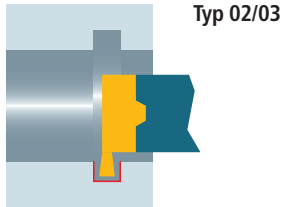
- Usinage intérieur dès Ø 7.8 mm
- Grande flexibilité et interchangeabilité
- Positionnement garanti par autocentrage de l'appui
- Arrosage central pour les longueurs utiles jusqu'à 80 mm

Advantages

- Turning from Ø 7.8 mm
- Great flexibility by exchangeability
- Easy handling by 3-rib notching
- Internal cooling system until length of 80 mm

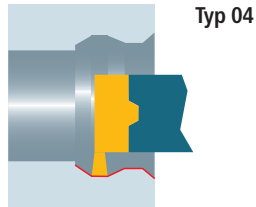
Einstechen (radial)
 Rainurage (radial)
 Grooving (radial)

Schneiden | Plaquettes | Inserts □ 193...



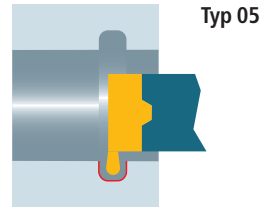
Vornedrehen
 Tournage avant
 Front turning

Schneiden | Plaquettes | Inserts □ 195...



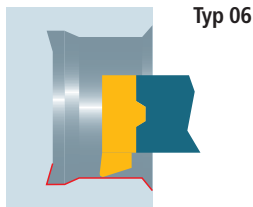
Einstechen und Längsdrehen (Vollradius)
 Rainurage et rayonnage (Rayon complet)
 Grooving and turning (Full nose radius)

Schneiden | Plaquettes | Inserts □ 196...



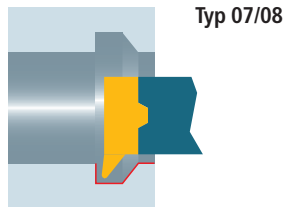
Vornedrehen
 Tournage avant
 Front turning

Schneiden | Plaquettes | Inserts □ 197...



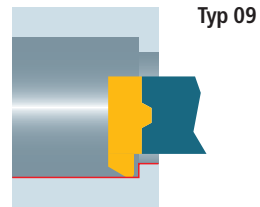
Vornedrehen (Innenfreistich) und Kopieren
 Tournage avant (Dégagement) et copier
 Front turning (Profiling under cuts) and copying

Schneiden | Plaquettes | Inserts □ 198...



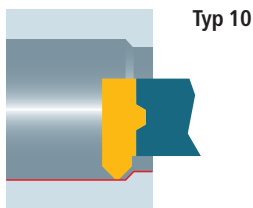
Hintendrehen
 Tournage arrière
 Back turning

Schneiden | Plaquettes | Inserts □ 199...



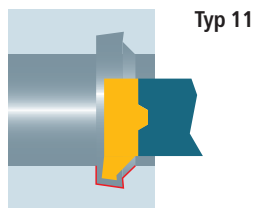
Ausdrehen und Fasen
 Chanfreinage et tournage
 Chamfering and turning

Schneiden | Plaquettes | Inserts □ 200...



Vorstechen und Fasen
 Amorçe de tronçonnage et chanfreinage
 Pregrooving and chamfering

Schneiden | Plaquettes | Inserts □ 201...



Halter | Porte-outils | Holders

□ 209...

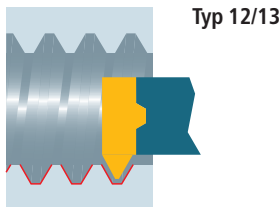
Alle Abbildungen sind in rechter Ausführung dargestellt. Linke Ausführung auch lieferbar.

Toutes les illustrations représentent des exécutions à droite. Les exécutions à gauche sont aussi livrables.

All illustrations show right hand design. Left hand design is also available.

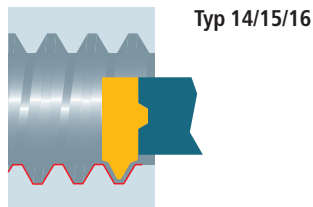
Gewindedrehen (Teilprofil)
 Filetage (profil partiel)
 Threading (partial profile)

Schneiden | Plaquettes | Inserts □ 202...



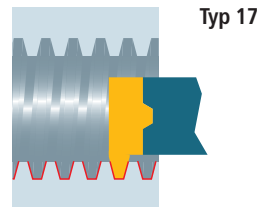
Gewindedrehen (Vollprofil)
 Filetage (profil complet)
 Threading (full profile)

Schneiden | Plaquettes | Inserts □ 203...



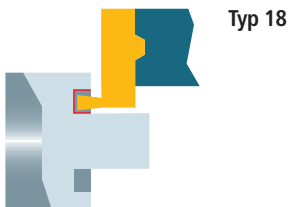
Gewindedrehen (Trapez)
 Filetage (trapézoïdal)
 Threading (trapezoid)

Schneiden | Plaquettes | Inserts □ 205...



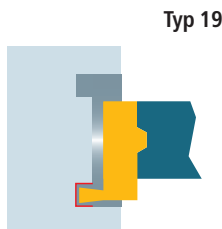
Einstechen (axial)
 Rainurage (axial)
 Grooving (axial)

Schneiden | Plaquettes | Inserts □ 206...



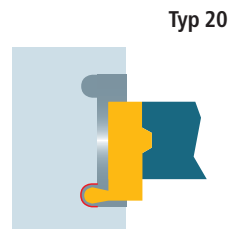
Einstechen (axial)
 Rainurage (axial)
 Grooving (axial)

Schneiden | Plaquettes | Inserts □ 207...



Einstechen (axial, Vollradius)
 Rainurage (axial, Rayon complet)
 Grooving (axial, Full nose radius)

Schneiden | Plaquettes | Inserts □ 208...



Halter | Porte-outils | Holders

□ 209...

Alle Abbildungen sind in rechter Ausführung dargestellt. Linke Ausführung auch lieferbar.

Toutes les illustrations représentent des exécutions à droite. Les exécutions à gauche sont aussi livrables.

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Rohling | Ebanche | Blank

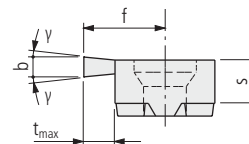
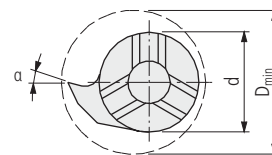
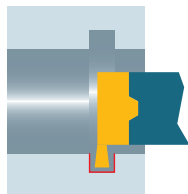


Bezeichnung Désignation Designation		Hartmetall Carbure Carbide □ 214	Dimensionen Dimensions Dimensions										Halter Porte-outil Holder
Typ 01		○ ○ ○ ●	D _{min}	d	f	s	t _{max}	b	a				□ 209...
L Linke Ausführung Exécution gauche Left execution	R Rechte Ausführung Exécution droite Right execution	... UHM 30 HX											
MEB 01 08 L	MEB 01 08 R	■	8	6	5.2	3	2	3.6	5°				MEB 00 08 ...
MEB 01 11 L	MEB 01 11 R	■	11	8	7.3	3.9	3.2	4.2	5°				MEB 00 11 ...
MEB 01 14 L	MEB 01 14 R	■	14	9	9.5	5	4.7	5.3	5°				MEB 00 14 ...
MEB 01 16 L	MEB 01 16 R	■	16	10.7	10.8	5.1	5.2	5.4	5°				MEB 00 16 ...



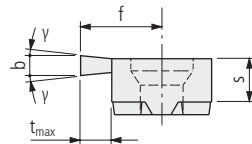
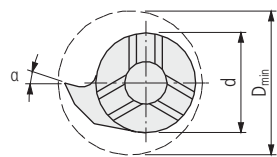
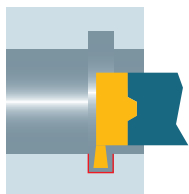
Bezeichnung Désignation Designation		Hartmetall Carbure Carbide □ 214	Dimensionen Dimensions Dimensions										Halter Porte-outil Holder
Typ 01		○ ○ ○ ●	D _{min}	d	f	s	t _{max}	b	a				□ 209...
L Linke Ausführung Exécution gauche Left execution	R Rechte Ausführung Exécution droite Right execution	... UHM 30 HX											
MEB 01 14 LA-18	MEB 01 14 RA-18	■	14	9	9.5	8.3	3.3	5	0°				MEB 00 14 ...
MEB 01 14 LA-19	MEB 01 14 RA-19	■	14	9	9.5	10.4	5.4	5	0°				MEB 00 14 ...

Einstechen | Rainurage | Grooving



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide $\square$ 214	Dimensionen Dimensions Dimensions										Halter Porte-outil Holder
Typ 02			D _{min}	d	f	s	t _{max}	b	Tol.	α	γ		$\square$ 209...
L	Rechte Ausführung Exécution droite Right execution	... UHM 30 HX											
MEB 02 08 10010 L	MEB 02 08 10010 R	■	8	6	4.8	3.3	1	1	+0.03	15°	2°		MEB 00 08 ...
MEB 02 08 15010 L	MEB 02 08 15010 R	■	8	6	4.8	3.3	1	1.5	+0.03	15°	2°		MEB 00 08 ...
MEB 02 08 20010 L	MEB 02 08 20010 R	■	8	6	4.8	3.3	1	2	+0.03	15°	2°		MEB 00 08 ...
MEB 02 11 10023 L	MEB 02 11 10023 R	■	11	8	6.7	4.2	2.3	1	+0.03	15°	2°		MEB 00 11 ...
MEB 02 11 15023 L	MEB 02 11 15023 R	■	11	8	6.7	4.2	2.3	1.5	+0.03	15°	2°		MEB 00 11 ...
MEB 02 11 20023 L	MEB 02 11 20023 R	■	11	8	6.7	4.2	2.3	2	+0.03	15°	2°		MEB 00 11 ...
MEB 02 11 25023 L	MEB 02 11 25023 R	■	11	8	6.7	4.2	2.3	2.5	+0.03	15°	2°		MEB 00 11 ...
MEB 02 11 30023 L	MEB 02 11 30023 R	■	11	8	6.7	4.2	2.3	3	+0.03	15°	2°		MEB 00 11 ...
MEB 02 14 15040 L	MEB 02 14 15040 R	■	14	9	9	5.3	4	1.5	+0.03	15°	2°		MEB 00 14 ...
MEB 02 14 15055 L	MEB 02 14 15055 R	■	16	9	10.5	5.3	5.5	1.5	+0.03	15°	2°		MEB 00 14 ...
MEB 02 14 15065 L	MEB 02 14 15065 R	■	17	9	11.5	5.3	6.5	1.5	+0.03	15°	2°		MEB 00 14 ...
MEB 02 14 20040 L	MEB 02 14 20040 R	■	14	9	9	5.3	4	2	+0.03	15°	2°		MEB 00 14 ...
MEB 02 14 20055 L	MEB 02 14 20055 R	■	16	9	10.5	5.3	5.5	2	+0.03	15°	2°		MEB 00 14 ...
MEB 02 14 20065 L	MEB 02 14 20065 R	■	17	9	11.5	5.3	6.5	2	+0.03	15°	2°		MEB 00 14 ...
MEB 02 14 25040 L	MEB 02 14 25040 R	■	14	9	9	5.3	4	2.5	+0.03	15°	2°		MEB 00 14 ...
MEB 02 14 25055 L	MEB 02 14 25055 R	■	16	9	10.5	5.3	5.5	2.5	+0.03	15°	2°		MEB 00 14 ...
MEB 02 14 25065 L	MEB 02 14 25065 R	■	17	9	11.5	5.3	6.5	2.5	+0.03	15°	2°		MEB 00 14 ...
MEB 02 14 30040 L	MEB 02 14 30040 R	■	14	9	9	5.3	4	3	+0.03	15°	2°		MEB 00 14 ...
MEB 02 14 30055 L	MEB 02 14 30055 R	■	16	9	10.5	5.3	5.5	3	+0.03	15°	2°		MEB 00 14 ...
MEB 02 14 30065 L	MEB 02 14 30065 R	■	17	9	11.5	5.3	6.5	3	+0.03	15°	2°		MEB 00 14 ...
MEB 02 16 15043 L	MEB 02 16 15043 R	■	16	11	10.2	5.4	4.3	1.5	+0.03	15°	2°		MEB 00 16 ...
MEB 02 16 20043 L	MEB 02 16 20043 R	■	16	11	10.2	5.4	4.3	2	+0.03	15°	2°		MEB 00 16 ...
MEB 02 16 25043 L	MEB 02 16 25043 R	■	16	11	10.2	5.4	4.3	2.5	+0.03	15°	2°		MEB 00 16 ...
MEB 02 16 30043 L	MEB 02 16 30043 R	■	16	11	10.2	5.4	4.3	3	+0.03	15°	2°		MEB 00 16 ...
MEB 02 16 35043 L	MEB 02 16 35043 R	■	16	11	10.2	5.4	4.3	3.5	+0.03	15°	2°		MEB 00 16 ...
MEB 02 16 40043 L	MEB 02 16 40043 R	■	16	11	10.2	5.4	4.3	4	+0.03	15°	2°		MEB 00 16 ...
MEB 02 18 15060 L	MEB 02 18 15060 R	■	18	11	12	5.6	6	1.5	+0.05	15°	2°		MEB 00 18 ...
MEB 02 18 15080 L	MEB 02 18 15080 R	■	20	11	14	5.6	8	1.5	+0.05	15°	2°		MEB 00 18 ...
MEB 02 18 20060 L	MEB 02 18 20060 R	■	18	11	12	5.6	6	2	+0.05	15°	2°		MEB 00 18 ...
MEB 02 18 20080 L	MEB 02 18 20080 R	■	20	11	14	5.6	8	2	+0.05	15°	2°		MEB 00 18 ...
MEB 02 18 25060 L	MEB 02 18 25060 R	■	18	11	12	5.6	6	2.5	+0.05	15°	2°		MEB 00 18 ...
MEB 02 18 25080 L	MEB 02 18 25080 R	■	20	11	14	5.6	8	2.5	+0.05	15°	2°		MEB 00 18 ...
MEB 02 18 30060 L	MEB 02 18 30060 R	■	18	11	12	5.6	6	3	+0.05	15°	2°		MEB 00 18 ...
MEB 02 18 30080 L	MEB 02 18 30080 R	■	20	11	14	5.6	8	3	+0.05	15°	2°		MEB 00 18 ...
MEB 02 18 35060 L	MEB 02 18 35060 R	■	18	11	12	5.6	6	3.5	+0.05	15°	2°		MEB 00 18 ...
MEB 02 18 35080 L	MEB 02 18 35080 R	■	20	11	14	5.6	8	3.5	+0.05	15°	2°		MEB 00 18 ...
MEB 02 18 40060 L	MEB 02 18 40060 R	■	18	11	12	5.6	6	4	+0.05	15°	2°		MEB 00 18 ...
MEB 02 18 40080 L	MEB 02 18 40080 R	■	20	11	14	5.6	8	4	+0.05	15°	2°		MEB 00 18 ...

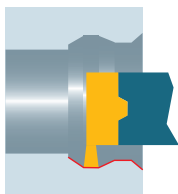
Einstecken (Ringnuten) | Rainurage (Rainure) | Grooving (Circlips)



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide □ 214	Dimensionen Dimensions Dimensions										Halter Porte-outil Holder
			D _{min}	d	f	s	t _{max}	b	α	γ	1)		
Typ 03								+0.03					□ 209...
L	Linke Ausführung Exécution gauche Left execution	R	Rechte Ausführung Exécution droite Right execution										
			... UHM 30 HX										
MEB 03 08 0070 L	MEB 03 08 0070 R	■	8.0	6.0	4.8	3.3	1.0	0.73	15°	2°	0.7		MEB 00 08 ...
MEB 03 08 0080 L	MEB 03 08 0080 R	■	8.0	6.0	4.8	3.3	1.0	0.83	15°	2°	0.8		MEB 00 08 ...
MEB 03 08 0090 L	MEB 03 08 0090 R	■	8.0	6.0	4.8	3.3	1.0	0.93	15°	2°	0.9		MEB 00 08 ...
MEB 03 08 0110 L	MEB 03 08 0110 R	■	8.0	6.0	4.8	3.3	1.0	1.20	15°	2°	1.1		MEB 00 08 ...
MEB 03 08 0130 L	MEB 03 08 0130 R	■	8.0	6.0	4.8	3.3	1.0	1.40	15°	2°	1.3		MEB 00 08 ...
MEB 03 08 0160 L	MEB 03 08 0160 R	■	8.0	6.0	4.8	3.3	1.0	1.70	15°	2°	1.6		MEB 00 08 ...
MEB 03 11 0070 L	MEB 03 11 0070 R	■	11.0	8.0	6.7	4.2	1.2	0.73	15°	2°	0.7		MEB 00 11 ...
MEB 03 11 0080 L	MEB 03 11 0080 R	■	11.0	8.0	6.7	4.2	1.3	0.83	15°	2°	0.8		MEB 00 11 ...
MEB 03 11 0090 L	MEB 03 11 0090 R	■	11.0	8.0	6.7	4.2	1.5	0.93	15°	2°	0.9		MEB 00 11 ...
MEB 03 11 0110 L	MEB 03 11 0110 R	■	11.0	8.0	6.7	4.2	2.3	1.20	15°	2°	1.1		MEB 00 11 ...
MEB 03 11 0130 L	MEB 03 11 0130 R	■	11.0	8.0	6.7	4.2	2.3	1.40	15°	2°	1.3		MEB 00 11 ...
MEB 03 11 0160 L	MEB 03 11 0160 R	■	11.0	8.0	6.7	4.2	2.3	1.70	15°	2°	1.6		MEB 00 11 ...
MEB 03 14 0070 L	MEB 03 14 0070 R	■	14.0	9.0	9.0	5.3	1.2	0.73	15°	2°	0.7		MEB 00 14 ...
MEB 03 14 0080 L	MEB 03 14 0080 R	■	14.0	9.0	9.0	5.3	1.3	0.83	15°	2°	0.8		MEB 00 14 ...
MEB 03 14 0090 L	MEB 03 14 0090 R	■	14.0	9.0	9.0	5.3	1.5	0.93	15°	2°	0.9		MEB 00 14 ...
MEB 03 14 0110 L	MEB 03 14 0110 R	■	14.0	9.0	9.0	5.3	4.0	1.20	15°	2°	1.1		MEB 00 14 ...
MEB 03 14 0130 L	MEB 03 14 0130 R	■	14.0	9.0	9.0	5.3	4.0	1.40	15°	2°	1.3		MEB 00 14 ...
MEB 03 14 0160 L	MEB 03 14 0160 R	■	14.0	9.0	9.0	5.3	4.0	1.70	15°	2°	1.6		MEB 00 14 ...
MEB 03 16 0070 L	MEB 03 16 0070 R	■	16.0	11.0	10.2	5.4	1.2	0.73	15°	2°	0.7		MEB 00 16 ...
MEB 03 16 0080 L	MEB 03 16 0080 R	■	16.0	11.0	10.2	5.4	1.3	0.83	15°	2°	0.8		MEB 00 16 ...
MEB 03 16 0090 L	MEB 03 16 0090 R	■	16.0	11.0	10.2	5.4	1.5	0.93	15°	2°	0.9		MEB 00 16 ...
MEB 03 16 0110 L	MEB 03 16 0110 R	■	16.0	11.0	10.2	5.4	4.3	1.20	15°	2°	1.1		MEB 00 16 ...
MEB 03 16 0130 L	MEB 03 16 0130 R	■	16.0	11.0	10.2	5.4	4.3	1.40	15°	2°	1.3		MEB 00 16 ...
MEB 03 16 0160 L	MEB 03 16 0160 R	■	16.0	11.0	10.2	5.4	4.3	1.70	15°	2°	1.6		MEB 00 16 ...

1) Seegerring-Breite | Largeur de circlip | Width of circlip

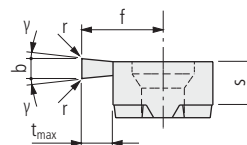
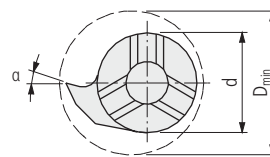
Vornedrehen | Tournage avant | Front turning



L

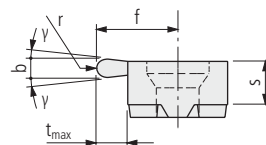
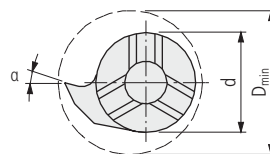
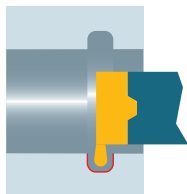


R



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide  214	Dimensionen Dimensions Dimensions										Halter Porte-outil Holder
			D _{min}	d	f	s	t _{max}	b	r	α	γ		
Typ 04													 209...
 Linke Ausführung Exécution gauche Left execution	 Rechte Ausführung Exécution droite Right execution	... UHM 30 HX											
MEB 04 08 15010 L	MEB 04 08 15010 R		8	6	4.8	3.3	1	1.5	0.2	15°	2°		MEB 00 08 ...
MEB 04 08 20010 L	MEB 04 08 20010 R		8	6	4.8	3.3	1	2	0.2	15°	2°		MEB 00 08 ...
MEB 04 11 15023 L	MEB 04 11 15023 R		11	8	6.7	4.2	2.3	1.5	0.2	15°	2°		MEB 00 11 ...
MEB 04 11 20023 L	MEB 04 11 20023 R		11	8	6.7	4.2	2.3	2	0.2	15°	2°		MEB 00 11 ...
MEB 04 14 15040 L	MEB 04 14 15040 R		14	9	9	5.3	4	1.5	0.2	15°	2°		MEB 00 14 ...
MEB 04 14 15055 L	MEB 04 14 15055 R		16	9	10.5	5.3	5.5	1.5	0.2	15°	2°		MEB 00 14 ...
MEB 04 14 15065 L	MEB 04 14 15065 R		17	9	11.5	5.3	6.5	1.5	0.2	15°	2°		MEB 00 14 ...
MEB 04 14 20040 L	MEB 04 14 20040 R		14	9	9	5.3	4	2	0.2	15°	2°		MEB 00 14 ...
MEB 04 14 20055 L	MEB 04 14 20055 R		16	9	10.5	5.3	5.5	2	0.2	15°	2°		MEB 00 14 ...
MEB 04 14 20065 L	MEB 04 14 20065 R		17	9	11.5	5.3	6.5	2	0.2	15°	2°		MEB 00 14 ...
MEB 04 14 25055 L	MEB 04 14 25055 R		16	9	9	5.3	5.5	2.5	0.2	15°	2°		MEB 00 14 ...
MEB 04 14 25065 L	MEB 04 14 25065 R		17	9	10.5	5.3	6.5	2.5	0.2	15°	2°		MEB 00 14 ...
MEB 04 14 30055 L	MEB 04 14 30055 R		16	9	11.5	5.3	5.5	3	0.2	15°	2°		MEB 00 14 ...
MEB 04 14 30065 L	MEB 04 14 30065 R		17	9	9	5.3	6.5	3	0.2	15°	2°		MEB 00 14 ...
MEB 04 16 20043 L	MEB 04 16 20043 R		16	11	10.2	5.4	4.3	2	0.2	15°	2°		MEB 00 16 ...

Einstechen und Längsdrehen (Vollradius) | Rainurage et rayonnage (rayon complet) | Grooving and turning (full nose radius)



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Bezeichnung Désignation Designation		Hartmetall Carbure Carbide  214	Dimensionen Dimensions Dimensions										Halter Porte-outil Holder
Typ 05			D _{min}	d	f	s	t _{max}	b	r	α	γ		 209...
													
													
													
 Linke Ausführung Exécution gauche Left execution	 Rechte Ausführung Exécution droite Right execution	UHM 30 HX ...											
MEB 05 08 0080 L	MEB 05 08 0080 R		8	6	4.8	3.3	1	0.8	0.4	13°	2°		MEB 00 08 ...
MEB 05 08 0120 L	MEB 05 08 0120 R		8	6	4.8	3.3	1	1.2	0.6	13°	2°		MEB 00 08 ...
MEB 05 08 0180 L	MEB 05 08 0180 R		8	6	4.8	3.3	1	1.8	0.9	13°	2°		MEB 00 08 ...
MEB 05 11 0080 L	MEB 05 11 0080 R		11	8	6.7	4.2	2.3	0.8	0.4	13°	2°		MEB 00 11 ...
MEB 05 11 0120 L	MEB 05 11 0120 R		11	8	6.7	4.2	2.3	1.2	0.6	13°	2°		MEB 00 11 ...
MEB 05 11 0180 L	MEB 05 11 0180 R		11	8	6.7	4.2	2.3	1.8	0.9	13°	2°		MEB 00 11 ...
MEB 05 11 0200 L	MEB 05 11 0200 R		11	8	6.7	4.2	2.3	2	1	13°	2°		MEB 00 11 ...
MEB 05 11 0300 L	MEB 05 11 0300 R		11	8	6.7	4.2	2.3	3	1.5	13°	2°		MEB 00 11 ...
MEB 05 14 0120 L	MEB 05 14 0120 R		14	9	9	4	4	1.2	0.6	13°	2°		MEB 00 14 ...
MEB 05 14 0180 L	MEB 05 14 0180 R		14	9	9	4	4	1.8	0.9	13°	2°		MEB 00 14 ...
MEB 05 14 0200 L	MEB 05 14 0200 R		14	9	9	4	4	2	1	13°	2°		MEB 00 14 ...
MEB 05 14 0220 L	MEB 05 14 0220 R		14	9	9	4	4	2.2	1.1	13°	2°		MEB 00 14 ...
MEB 05 14 0300 L	MEB 05 14 0300 R		14	9	9	4	4	3	1.5	13°	2°		MEB 00 14 ...
MEB 05 16 0180 L	MEB 05 16 0180 R		16	11	10.2	5.4	4.3	1.8	0.9	13°	2°		MEB 00 16 ...
MEB 05 16 0220 L	MEB 05 16 0220 R		16	11	10.2	5.4	4.3	2.2	1.1	13°	2°		MEB 00 16 ...
MEB 05 16 0300 L	MEB 05 16 0300 R		16	11	10.2	5.4	4.3	3	1.5	13°	2°		MEB 00 16 ...
MEB 05 16 0400 L	MEB 05 16 0400 R		16	11	10.2	5.4	4.3	4	2	13°	2°		MEB 00 16 ...

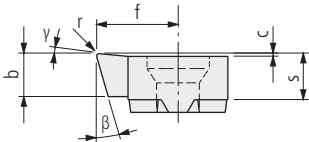
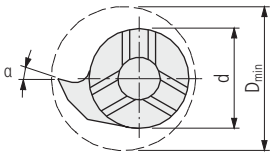
Vornedrehen | Tournage avant | Front turning



L



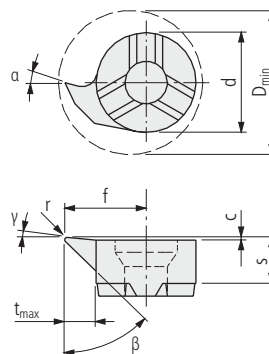
R



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide  214	Dimensionen Dimensions Dimensions											Halter Porte-outil Holder
		   	D _{min}	d	f	s	b	r	a	β	γ	c		
Typ 06*													 209...	
 Linke Ausführung Exécution gauche Left execution	 Rechte Ausführung Exécution droite Right execution	UHM 30 HX ...												
MEB 06 08 0780 L	MEB 06 08 0780 R		7.8	6	4.65	3.5	3.3	0.2	15°	18°	8°	0.4	MEB 00 08 ...	
MEB 06 11 0980 L	MEB 06 11 0980 R		9.8	8	5.5	4.2	3.9	0.2	15°	18°	8°	0.4	MEB 00 11 ...	
MEB 06 11 1100 L	MEB 06 11 1100 R		11	8	6.7	4.2	3.9	0.2	15°	18°	8°	0.4	MEB 00 11 ...	
MEB 06 14 1380 L	MEB 06 14 1380 R		13.8	9	8.7	5.1	5	0.2	15°	18°	8°	0.4	MEB 00 14 ...	
MEB 06 16 1550 L	MEB 06 16 1550 R		15.5	11	9.7	5.4	5	0.2	15°	18°	8°	0.4	MEB 00 16 ...	

*Schneiden «Hard Cut» (CBN) auf Anfrage | Outils en «Hard Cut» (CBN) sur demande | Inserts «Hard Cut» (CBN) on demand

Vornedrehen (Innenfreistich) und Kopieren | Tournage avant (dégagement) et copier | Front turning (profiling undercuts) and copying



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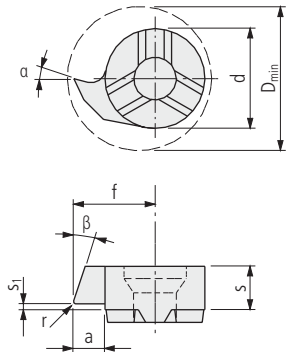
Bezeichnung Désignation Designation		Hartmetall Carbure Carbide  214	Dimensionen Dimensions Dimensions										Halter Porte-outil Holder
			D _{min}	d	f	s	t _{max}	r	α	β	γ	c	
													
													
Typ 07 (DIN 509)*													 209...
 Linke Ausführung Exécution gauche Left execution	 Rechte Ausführung Exécution droite Right execution	UHM 30 HX ...											
MEB 07 08 0120 L	MEB 07 08 0120 R		7.8	6	4.65	3.5	1.2	0.2	15°	47°	3°	0.4	MEB 00 08 ...
MEB 07 11 0230 L	MEB 07 11 0230 R		11	8	6.7	4.2	2.3	0.2	15°	47°	3°	0.4	MEB 00 11 ...
MEB 07 14 0300 L	MEB 07 14 0300 R		13.7	9	8.7	5.3	3	0.2	15°	47°	3°	0.4	MEB 00 14 ...
MEB 07 18 0600 L	MEB 07 18 0600 R		18	11	12	5.6	6	0.2	15°	47°	3°	0.4	MEB 00 18 ...
MEB 07 18 0800 L	MEB 07 18 0800 R		20	11	14	5.6	8	0.2	15°	47°	3°	0.4	MEB 00 18 ...

*Innenfreistich | Dégagement | Profiling undercuts

Bezeichnung Désignation Designation		Hartmetall Carbure Carbide  214	Dimensionen Dimensions Dimensions											Halter Porte-outil Holder
			D _{min}	d	f	s	t _{max}	r	α	β	γ	c		
Typ 08*													 209...	
 Linke Ausführung Exécution gauche Left execution	 Rechte Ausführung Exécution droite Right execution	 UHM 30 HX												
MEB 08 08 0100 L	MEB 08 08 0100 R		7.8	6	4.65	3.5	1	0.2	15°	30°	3°	0.4	MEB 00 08 ...	
MEB 08 11 0230 L	MEB 08 11 0230 R		11	8	6.7	4.2	2.3	0.2	15°	30°	3°	0.4	MEB 00 11 ...	
MEB 08 14 0400 L	MEB 08 14 0400 R		13.7	9	8.7	5.3	4	0.2	15°	30°	3°	0.4	MEB 00 14 ...	
MEB 08 16 0430 L	MEB 08 16 0430 R		15.8	11	10.2	5.4	4.3	0.2	15°	30°	3°	0.4	MEB 00 16 ...	

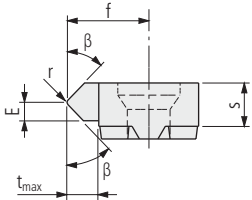
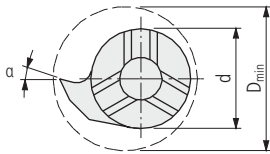
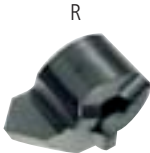
*Kopieren | Copier | Copying

Hintendrehen | Tournage arrière | Back turning



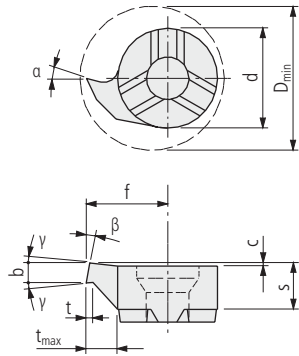
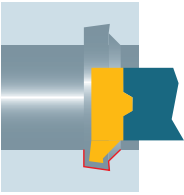
Bezeichnung Désignation Designation		Hartmetall Carbure Carbide  214	Dimensionen Dimensions Dimensions											Halter Porte-outil Holder
Typ 09				D _{min}	d	f	s	s ₁	a	r	α	β	 209...	
														
														
														
 L	Linke Ausführung Exécution gauche Left execution	 R	Rechte Ausführung Exécution droite Right execution	UHM 30 HX ...										
MEB 09 08 0465 L	MEB 09 08 0465 R			7.8	6	4.65	3.5	1	1.3	0.2	5°	30°	MEB 00 08 ...	
MEB 09 11 0670 L	MEB 09 11 0670 R			11	8	6.7	4.3	1.6	2.3	0.2	5°	30°	MEB 00 11 ...	
MEB 09 14 0870 L	MEB 09 14 0870 R			13.8	9	8.7	5.4	2.4	3.5	0.2	5°	30°	MEB 00 14 ...	

Ausdrehen und Fasen | Chanfreinage et tournage | Chamfering and turning



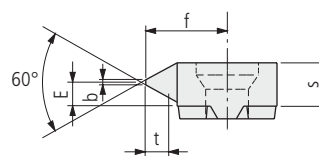
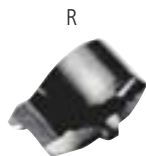
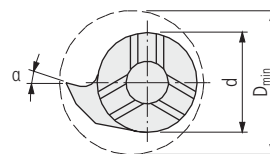
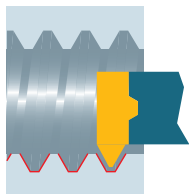
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Typ 10		● ● ● ○	D _{min}	d	f	s	t _{max}	E	r	α	β		□ 209...
L	Linke Ausführung Exécution gauche Left execution	R	Rechte Ausführung Exécution droite Right execution										
MEB 10 08 0140 L	MEB 10 08 0140 R	■	8	6	4.8	3.5	1.4	1.8	0.2	15°	45°		MEB 00 08 ...
MEB 10 11 0150 L	MEB 10 11 0150 R	■	11	8	6.7	4.3	1.5	2.2	0.2	15°	45°		MEB 00 11 ...
MEB 10 14 0150 L	MEB 10 14 0150 R	■	14	9	9	5.4	1.5	2.8	0.2	15°	45°		MEB 00 14 ...

Vorstechen und Fasen | Amorçe de tronçonnage et chanfreinage | Pregrooving and chamfering



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide □ 214	Dimensionen Dimensions Dimensions										Halter Porte-outil Holder
Typ 11		● ● ● ○	D _{min}	d	f	s	t _{max}	t	b	α	β	γ	□ 209...
L	Linke Ausführung Exécution gauche Left execution	R	Rechte Ausführung Exécution droite Right execution										
MEB 11 08 0810 L	MEB 11 08 0810 R	■	8	6	4.8	3.3	1	0.2	1	15°	8°	3°	MEB 00 08 ...
MEB 11 11 0810 L	MEB 11 11 0810 R	■	11	8	6.7	4.2	1.5	0.2	1	15°	8°	3°	MEB 00 11 ...
MEB 11 14 0810 L	MEB 11 14 0810 R	■	14	9	9	5.3	1.5	0.2	1	15°	8°	3°	MEB 00 14 ...
MEB 11 16 0810 L	MEB 11 16 0810 R	■	16	11	10.2	5.4	1.5	0.2	1	15°	8°	3°	MEB 00 16 ...

Gewindedrehen (Teilprofil) | Filetage (profil partiel) | Threading (partial profile)



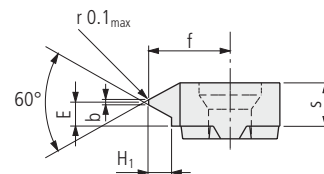
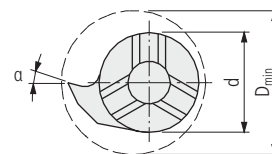
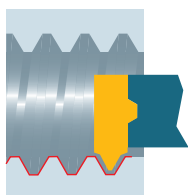
Bezeichnung Désignation Designation		Hartmetall Carbure Carbide □ 214	Dimensionen Dimensions Dimensions										Halter Porte-outil Holder
			D _{min}	d	f	s	b	t	E	Steigung Pas Pitch			□ 209...
Typ 12*													
L Linke Ausführung Exécution gauche Left execution	R Rechte Ausführung Exécution droite Right execution	... UHM 30 HX											
MEB 12 08 6015 L	MEB 12 08 6015 R	■	8	6	4.8	3.5	0.18	0.95	2.5	1.5/1.75			MEB 00 08 ...
MEB 12 11 6020 L	MEB 12 11 6020 R	■	11	8	6.7	4.3	0.25	1.08	3	2			MEB 00 11 ...
MEB 12 11 6025 L	MEB 12 11 6025 R	■	11	8	6.7	4.3	0.31	1.35	3	2.5			MEB 00 11 ...
MEB 12 14 6020 L	MEB 12 14 6020 R	■	14	9	9	5.4	0.25	1.08	4.2	2			MEB 00 14 ...
MEB 12 14 6025 L	MEB 12 14 6025 R	■	14	9	9	5.4	0.31	1.35	4.7	2.5			MEB 00 14 ...
MEB 12 16 6025 L	MEB 12 16 6025 R	■	16	11	10.2	5.5	0.31	1.35	4.2	2.5			MEB 00 16 ...

*ISO

Bezeichnung Désignation Designation		Hartmetall Carbure Carbide □ 214	Dimensionen Dimensions Dimensions										Halter Porte-outil Holder
			D _{min}	d	f	s	b	t	E	Steigung Pas Pitch			□ 209...
Typ 13*													
L Linke Ausführung Exécution gauche Left execution	R Rechte Ausführung Exécution droite Right execution	... UHM 30 HX											
MEB 13 08 6005 L	MEB 13 08 6005 R	■	8	6	4.8	3.5	0.06	0.43	2.7	0.5/0.75			MEB 00 08 ...
MEB 13 08 6010 L	MEB 13 08 6010 R	■	8	6	4.8	3.5	0.12	0.7	2.7	1/1.25			MEB 00 08 ...
MEB 13 11 6005 L	MEB 13 11 6005 R	■	11	8	6.7	4.3	0.06	0.75	3.5	0.5/0.75			MEB 00 11 ...
MEB 13 11 6010 L	MEB 13 11 6010 R	■	11	8	6.7	4.3	0.12	0.55	3.5	1			MEB 00 11 ...
MEB 13 11 6015 L	MEB 13 11 6015 R	■	11	8	6.7	4.3	0.18	0.81	3.5	1.5			MEB 00 11 ...
MEB 13 14 6010 L	MEB 13 14 6010 R	■	14	9	9	5.4	0.12	0.55	4.7	1			MEB 00 14 ...
MEB 13 14 6015 L	MEB 13 14 6015 R	■	14	9	9	5.4	0.18	0.81	4.5	1.5			MEB 00 14 ...
MEB 13 16 6010 L	MEB 13 16 6010 R	■	16	11	10.2	5.5	0.12	0.55	4.7	1			MEB 00 16 ...
MEB 13 16 6015 L	MEB 13 16 6015 R	■	16	11	10.2	5.5	0.18	0.81	4.5	1.5			MEB 00 16 ...
MEB 13 16 6020 L	MEB 13 16 6020 R	■	16	11	10.2	5.5	0.25	1.08	4.2	2			MEB 00 16 ...

*ISO (Feingewinde | pas fin | fine thread)

Gewindedrehen (Vollprofil) | Filetage (profil complet) | Threading (full profile)



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide 	Dimensionen Dimensions Dimensions										Halter Porte-outil Holder
		   	D _{min}	d	f	s	b	H ₁	E	Steigung Pas Pitch			
Typ 14*												 209...	
 Linke Ausführung Exécution gauche Left execution	 Rechte Ausführung Exécution droite Right execution	UHM 30 HX ...											
MEB 14 11 6020 L	MEB 14 11 6020 R		11	8	6.7	4.3	0.25	1.08	3.2	2		MEB 00 11 ...	
MEB 14 11 6025 L	MEB 14 11 6025 R		11	8	6.7	4.3	0.31	1.35	3	2.5		MEB 00 11 ...	
MEB 14 11 6030 L	MEB 14 11 6030 R		11	8	6.7	4.3	0.37	1.62	2.9	3		MEB 00 11 ...	
MEB 14 14 6020 L	MEB 14 14 6020 R		14	9	9	5.4	0.25	1.08	4.2	2		MEB 00 14 ...	
MEB 14 14 6025 L	MEB 14 14 6025 R		14	9	9	5.4	0.31	1.35	4.7	2.5		MEB 00 14 ...	
MEB 14 16 6025 L	MEB 14 16 6025 R		16	11	10.2	5.5	0.31	1.35	4.2	2.5		MEB 00 16 ...	
MEB 14 16 6030 L	MEB 14 16 6030 R		16	11	10.2	5.5	0.37	1.62	4	3		MEB 00 16 ...	
MEB 14 16 6035 L	MEB 14 16 6035 R		16	11	10.2	5.5	0.43	1.89	3.8	3.5		MEB 00 16 ...	
MEB 14 16 6040 L	MEB 14 16 6040 R		16	11	10.2	5.5	0.50	2.16	3.6	4		MEB 00 16 ...	

*ISO

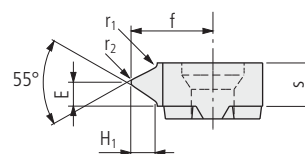
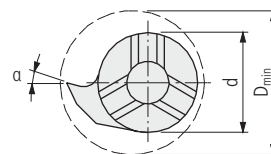
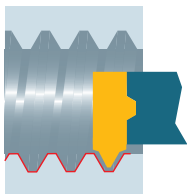
Bezeichnung Désignation Designation		Hartmetall Carbure Carbide  214	Dimensionen Dimensions Dimensions										Halter Porte-outil Holder
		   	D _{min}	d	f	s	b	H ₁	E	Steigung Pas Pitch			
Typ 15*												 209...	
 Linke Ausführung Exécution gauche Left execution	 Rechte Ausführung Exécution droite Right execution	UHM 30 HX ...											
MEB 15 11 6010 L	MEB 15 11 6010 R		11	8	6.7	4.3	0.12	0.54	3.5	1		MEB 00 11 ...	
MEB 15 11 6015 L	MEB 15 11 6015 R		11	8	6.7	4.3	0.18	0.81	3.5	1.5		MEB 00 11 ...	
MEB 15 14 6005 L	MEB 15 14 6005 R		14	9	9	5.4	0.06	0.27	0.5	0.5		MEB 00 14 ...	
MEB 15 14 6010 L	MEB 15 14 6010 R		14	9	9	5.4	0.12	0.54	3.5	1		MEB 00 14 ...	
MEB 15 14 6015 L	MEB 15 14 6015 R		14	9	9	5.4	0.18	0.81	3.3	1.5		MEB 00 14 ...	
MEB 15 16 6010 L	MEB 15 16 6010 R		16	11	10.2	5.5	0.12	0.54	4.7	1		MEB 00 16 ...	
MEB 15 16 6015 L	MEB 15 16 6015 R		16	11	10.2	5.5	0.18	0.81	4.5	1.5		MEB 00 16 ...	
MEB 15 16 6020 L	MEB 15 16 6020 R		16	11	10.2	5.5	0.25	1.08	4.2	2		MEB 00 16 ...	

*ISO (Feingewinde | pas fin | fine thread)

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multidec
swiss type tools

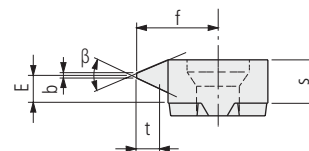
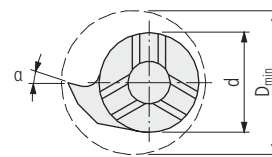
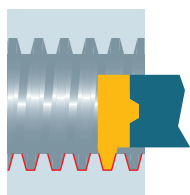
Gewindedrehen (Vollprofil) | Filetage (profil complet) | Threading (full profile)



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide □ 214	Dimensionen Dimensions Dimensions										Halter Porte-outil Holder
			D _{min}	d	f	s	H ₁	E	G	p	r ₁	r ₂	
Typ 16*													□ 209...
L	Linke Ausführung Exécution gauche Left execution	R	Rechte Ausführung Exécution droite Right execution	G = Gänge/Zoll filets/pouce thread pitches/inch									
MEB 16 11 5514 L	MEB 16 11 5514 R	□	11	8	6.7	4.3	1.16	3	14	1.814	0.24	0.24	MEB 00 11 ...
MEB 16 11 5519 L	MEB 16 11 5519 R	□	11	8	6.7	4.3	0.85	2.7	19	1.337	0.18	0.18	MEB 00 11 ...
MEB 16 14 5514 L	MEB 16 14 5514 R	□	14	9	9	5.4	1.16	3.6	14	1.814	0.24	0.24	MEB 00 14 ...
MEB 16 14 5519 L	MEB 16 14 5519 R	□	14	9	9	5.4	0.85	3.8	19	1.337	0.18	0.18	MEB 00 14 ...
MEB 16 16 5511 L	MEB 16 16 5511 R	□	16	11	10.2	5.5	1.48	3.5	11	2.309	0.31	0.31	MEB 00 16 ...
MEB 16 16 5514 L	MEB 16 16 5514 R	□	16	11	10.2	5.5	1.16	3.9	14	1.814	0.24	0.24	MEB 00 16 ...

*Withworth

Gewindedrehen (Trapez) | Filetage (trapézoïdal) | Threading (trapezoid)

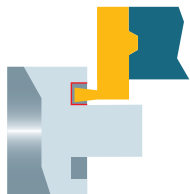


Bezeichnung Désignation Designation		Hartmetall Carbure Carbide  214	Dimensionen Dimensions Dimensions											Halter Porte-outil Holder
			D _{min}	d	f	s	b	t	E	P	α	β		
Typ 17													 209...	
 Linke Ausführung Exécution gauche Left execution	 Rechte Ausführung Exécution droite Right execution	UHM 30 HX ...												
MEB 17 11 3015 L	MEB 17 11 3015 R		11	8	6.7	4.3	0.47	0.9	3.7	1.5	5°	30°	MEB 00 11 ...	
MEB 17 11 3020 L	MEB 17 11 3020 R		11	8	6.7	4.3	0.6	1.25	3.5	2	5°	30°	MEB 00 11 ...	
MEB 17 11 3030 L	MEB 17 11 3030 R		11	8	6.7	4.3	0.96	1.75	3.2	3	5°	30°	MEB 00 11 ...	
MEB 17 11 3040 L	MEB 17 11 3040 R		11	8	6.7	4.3	1.33	2.25	2.6	4	5°	30°	MEB 00 11 ...	
MEB 17 14 3020 L	MEB 17 14 3020 R		14	9	9	5.4	0.6	1.25	4.3	2	5°	30°	MEB 00 14 ...	
MEB 17 14 3030 L	MEB 17 14 3030 R		14	9	9	5.4	0.96	1.75	4	3	5°	30°	MEB 00 14 ...	
MEB 17 14 3040 L	MEB 17 14 3040 R		14	9	9	5.4	1.33	2.25	3.6	4	5°	30°	MEB 00 14 ...	
MEB 17 14 3050 L	MEB 17 14 3050 R		14	9	9	5.4	1.69	2.75	3.3	5	5°	30°	MEB 00 14 ...	
MEB 17 16 3020 L	MEB 17 16 3020 R		16	11	9.7	5.5	0.6	1.25	4.5	2	5°	30°	MEB 00 16 ...	
MEB 17 16 3030 L	MEB 17 16 3030 R		16	11	9.7	5.5	0.96	1.75	4.3	3	5°	30°	MEB 00 16 ...	
MEB 17 16 3040 L	MEB 17 16 3040 R		16	11	9.7	5.5	1.33	2.25	4	4	5°	30°	MEB 00 16 ...	
MEB 17 16 3050 L	MEB 17 16 3050 R		16	11	10.2	5.5	1.69	2.75	3.55	5	5°	30°	MEB 00 16 ...	
MEB 17 16 3060 L	MEB 17 16 3060 R		16	11	10.2	5.5	1.92	3.5	3.3	6	5°	30°	MEB 00 16 ...	

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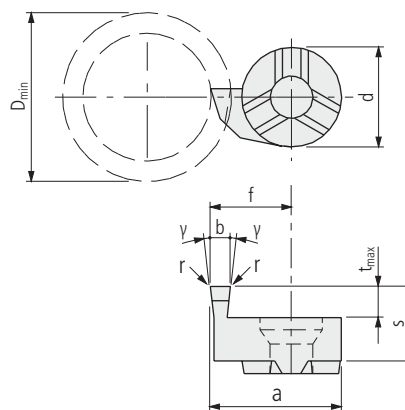
Einstecken (axial) | Rainurage (axial) | Grooving (axial)



L



R

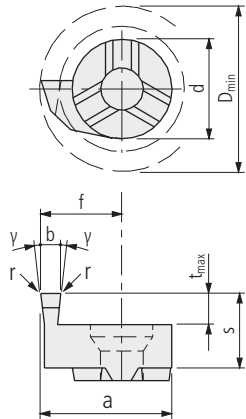


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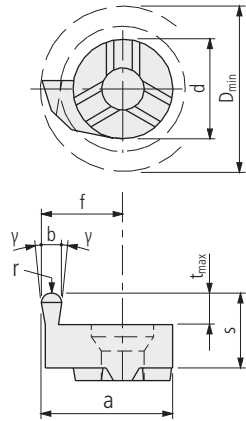
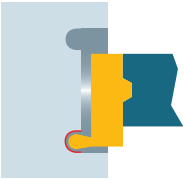
Bezeichnung Désignation Designation		Hartmetall Carbure Carbide □ 214	Dimensionen Dimensions Dimensions										Halter Porte-outil Holder
		● ● ● ○	D _{min}	d	f	s	b +0.03	t _{max}	a	r	γ		□ 209...
Typ 18													
L	Linke Ausführung Exécution gauche Left execution	R	Rechte Ausführung Exécution droite Right execution										
			... UHM 30 HX										
MEB 18 14 1015 L	MEB 18 14 1015 R	■	12	9	7	8.3	1	1.5	11.5	—	2°		MEB 00 14 ...
MEB 18 14 1525 L	MEB 18 14 1525 R	■	12	9	7.5	8.3	1.5	2.5	12	0.2	2°		MEB 00 14 ...
MEB 18 14 2030 L	MEB 18 14 2030 R	■	12	9	8	8.3	2	3	12.5	0.2	2°		MEB 00 14 ...
MEB 18 14 2530 L	MEB 18 14 2530 R	■	12	9	8.5	8.3	2.5	3	13	0.2	2°		MEB 00 14 ...
MEB 18 14 3030 L	MEB 18 14 3030 R	■	12	9	9	8.3	3	3	13.5	0.2	2°		MEB 00 14 ...
MEB 18 14 2050 L	MEB 18 14 2050 R	■	12	9	8	10.3	2	5	12.5	0.2	2°		MEB 00 14 ...
MEB 18 14 2550 L	MEB 18 14 2550 R	■	12	9	8.5	10.3	2.5	5	13	0.2	2°		MEB 00 14 ...
MEB 18 14 3050 L	MEB 18 14 3050 R	■	12	9	9	10.3	3	5	13.5	0.2	2°		MEB 00 14 ...

Einstecken (axial) | Rainurage (axial) | Grooving (axial)



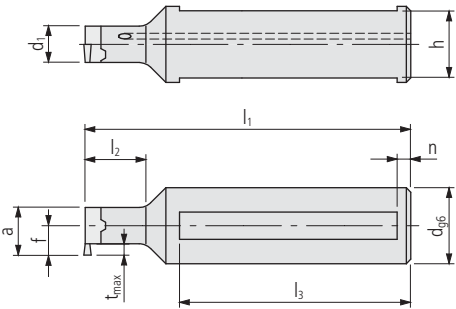
Bezeichnung Désignation Designation		Hartmetall Carbure Carbide  214	Dimensionen Dimensions Dimensions										Halter Porte-outil Holder	
			D _{min}	d	f	s	b	t _{max}	a	r	γ			
							+0.03							
Typ 19													 209...	
 L	Linke Ausführung Exécution gauche Left execution	 R	Rechte Ausführung Exécution droite Right execution											
			... UHM 30 HX											
MEB 19 14 1015 L	MEB 19 14 1015 L		14	9	9	8.3	1	1.5	13.5	—	2°		MEB 00 14 ...	
MEB 19 14 1525 L	MEB 19 14 1525 L		14	9	9	8.3	1.5	2.5	13.5	0.2	2°		MEB 00 14 ...	
MEB 19 14 2030 L	MEB 19 14 2030 L		14	9	9	8.3	2	3	13.5	0.2	2°		MEB 00 14 ...	
MEB 19 14 2530 L	MEB 19 14 2530 L		14	9	9	8.3	2.5	3	13.5	0.2	2°		MEB 00 14 ...	
MEB 19 14 3030 L	MEB 19 14 3030 L		14	9	9	8.3	3	3	13.5	0.2	2°		MEB 00 14 ...	
MEB 19 14 2050 L	MEB 19 14 2050 L		14	9	9	10.3	2	5	13.5	0.2	2°		MEB 00 14 ...	
MEB 19 14 2550 L	MEB 19 14 2550 L		14	9	9	10.3	2.5	5	13.5	0.2	2°		MEB 00 14 ...	
MEB 19 14 3050 L	MEB 19 14 3050 L		14	9	9	10.3	3	5	13.5	0.2	2°		MEB 00 14 ...	

Einstechen (axial, Vollradius) | Rainurage (axial, Rayon complet) | Grooving (axial, Full nose radius)



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide □ 214	Dimensionen Dimensions Dimensions										Halter Porte-outil Holder
		●	D _{min}	d	f	s	b	t _{max}	a	r	γ		□ 209...
Typ 20		●					+0.03						
L	Linke Ausführung Exécution gauche Left execution	R	Rechte Ausführung Exécution droite Right execution										
MEB 20 14 1015 L	MEB 20 14 1015 R	■	14	9	9	8.3	1	1.5	13.5	0.5	2°		MEB 00 14 ...
MEB 20 14 1625 L	MEB 20 14 1625 R	■	14	9	9	8.3	1.6	2.5	13.5	0.8	2°		MEB 00 14 ...
MEB 20 14 2030 L	MEB 20 14 2030 R	■	14	9	9	8.3	2	3	13.5	1	2°		MEB 00 14 ...
MEB 20 14 2530 L	MEB 20 14 2530 R	■	14	9	9	8.3	2.5	3	13.5	1.2	2°		MEB 00 14 ...
MEB 20 14 3030 L	MEB 20 14 3030 R	■	14	9	9	8.3	3	3	13.5	1.5	2°		MEB 00 14 ...

Mit interner Kühlmittelzufuhr | Avec arrosage central | With internal cooling

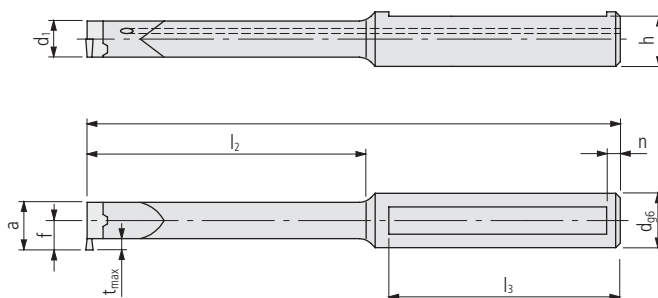


Bezeichnung Désignation Designation		Dimensionen Dimensions Dimensions										Schneiden Plaquettes Inserts
		D _{min}	d _{g6}	d ₁	l ₁	l ₂	l ₃	f	a	h	n	
Typ 00 ...ST*												□ 192...
MEB 00 08 08012 16 ST	■	8	16	6	80	12	60	4.8	7.8	15	5	MEB ... 08 ...
MEB 00 08 09022 16 ST	■	8	16	6	90	22	60	4.8	7.8	15	5	MEB ... 08 ...
MEB 00 11 09716 16 ST	■	11	16	8	97	16	60	6.7	10.7	15	5	MEB ... 11 ...
MEB 00 11 11029 16 ST	■	11	16	8	110	29	60	6.7	10.7	15	5	MEB ... 11 ...
MEB 00 14 10018 16 ST	■	14	16	9	100	18	60	1)	1)	15	5	MEB ... 14 ...
MEB 00 14 12038 16 ST	■	14	16	9	120	38	60	1)	1)	15	5	MEB ... 14 ...
MEB 00 16 10022 16 ST	■	16	16	11	100	22	60	10.2	15.7	15	5	MEB ... 16 ...
MEB 00 16 12042 16 ST	■	16	16	11	120	42	60	10.2	15.7	15	5	MEB ... 16 ...
MEB 00 18 09525 20 ST	■	18	20	11.5	95	25	60	1)	1)	19	5	MEB ... 18 ...
MEB 00 18 12045 20 ST	■	18	20	11.5	120	45	60	1)	1)	19	5	MEB ... 18 ...

*Stahl | Acier | Steel

1) Schneidplatten-abhängig | En fonction de l'outil | Depending on insert

Mit interner Kühlmittelzufuhr | Avec arrosage central | With internal cooling



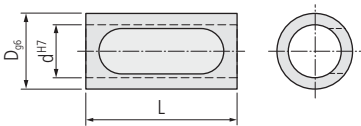
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Bezeichnung Désignation Designation		Dimensionen Dimensions Dimensions										Schneiden Plaquettes Inserts
		D _{min}	d _{g6}	d ₁	l ₁	l ₂	l ₃	f	a	h	n	
Typ 00 ...HM*												□ 192...
MEB 00 08 08021 12 HM	■	8	12	6	80	21	48	4.8	7.8	11	5	MEB ... 08 ...
MEB 00 08 09030 12 HM	■	8	12	6	90	30	48	4.8	7.8	11	5	MEB ... 08 ...
MEB 00 08 10042 12 HM	■	8	12	6	100	42	48	4.8	7.8	11	5	MEB ... 08 ...
MEB 00 08 11550 12 HM	■	8	12	6	115	50	48	4.8	7.8	11	5	MEB ... 08 ...
MEB 00 11 09529 12 HM	■	11	12	8	95	29	60	6.7	10.7	11	5	MEB ... 11 ...
MEB 00 11 11042 12 HM	■	11	12	8	110	42	60	6.7	10.7	11	5	MEB ... 11 ...
MEB 00 11 12056 12 HM	■	11	12	8	120	56	60	6.7	10.7	11	5	MEB ... 11 ...
MEB 00 11 13064 12 HM	■	11	12	8	130	64	60	6.7	10.7	11	5	MEB ... 11 ...
MEB 00 14 10034 12 HM	■	14	12	9	100	34	60	1)	1)	11	5	MEB ... 14 ...
MEB 00 14 11045 12 HM	■	14	12	9	110	45	60	1)	1)	11	5	MEB ... 14 ...
MEB 00 14 13064 12 HM	■	14	12	9	130	64	60	1)	1)	11	5	MEB ... 14 ...
MEB 00 14 10034 16 HM	■	14	16	9	100	34	60	1)	1)	15	5	MEB ... 14 ...
MEB 00 14 11045 16 HM	■	14	16	9	110	45	60	1)	1)	15	5	MEB ... 14 ...
MEB 00 14 13064 16 HM	■	14	16	9	130	64	60	1)	1)	15	5	MEB ... 14 ...
MEB 00 14 14575 16 HM	■	14	16	9	145	75	60	1)	1)	15	5	MEB ... 14 ...
MEB 00 16 13040 12 HM	■	16	12	11	130	40	60	10.2	15.7	11	5	MEB ... 16 ...
MEB 00 16 13056 12 HM	■	16	12	11	130	56	60	10.2	15.7	11	5	MEB ... 16 ...
MEB 00 16 15080 12 HM	■	16	12	11	150	80	60	10.2	15.7	11	5	MEB ... 16 ...
MEB 00 16 13040 16 HM	■	16	16	11	130	40	60	10.2	15.7	15	5	MEB ... 16 ...
MEB 00 16 13056 16 HM	■	16	16	11	130	56	60	10.2	15.7	15	5	MEB ... 16 ...
MEB 00 16 15080 16 HM	■	16	16	11	150	80	60	10.2	15.7	15	5	MEB ... 16 ...
MEB 00 18 10042 16 HM	■	18	16	11.5	100	42	60	1)	1)	15	5	MEB ... 18 ...
MEB 00 18 13060 16 HM	■	18	16	11.5	130	60	60	1)	1)	15	5	MEB ... 18 ...
MEB 00 18 16085 16 HM	■	18	16	11.5	160	85	60	1)	1)	15	5	MEB ... 18 ...
MEB 00 18 16085 20 HM	■	18	20	11.5	160	85	60	1)	1)	19	5	MEB ... 18 ...

*Hartmetall | Carburé | Carbide

1) Schneidplatten-abhängig | En fonction de l'outil | Depending on insert



Bezeichnung Désignation Designation		Dimensionen Dimensions Dimensions											
		d _{H7}	D _{g6}	L									
MRH...													
MRH 1600 1230	■	12	16	30									
MRH 1905 1240	■	12	19.05	40									
MRH 2200 1240	■	12	22	40									
MRH 2540 1240	■	12	25.4	40									
MRH 1905 1640	■	16	19.05	40									
MRH 2200 1640	■	16	22	40									
MRH 2540 1640	■	16	25.4	40									
MRH 15875 1230	■	12	15.875	30									

Abbildung Illustration Illustration	Bezeichnung Désignation Designation	Dimensionen Dimensions Dimensions	Beschreibung Description Description	Halter Porte-outil Holder
	MSP 26060 T08	M2.6 × 6 T08	Torxschraube Vis torx Torx scew	MEB 00 08...
	MSP 35070 T10	M3.5 × 7 T10		MEB 00 11...
	MSP 40090 T15	M4.0 × 9 T15		MEB 00 14...
	MSP 50120 T20	M5.0 × 9 T20		MEB 00 16/18...
	MSP TX08	T08	Torxschlüssel Tournevis torx Torx screwdriver	MEB 00 08...
	MSP TX10	T10		MEB 00 11...
	MSP TX15	T15		MEB 00 14...
	MSP TX20	T20		MEB 00 16/18...

Werkstoffe | Matières | Materials

	Stahl unlegiert Acier non allié Steel unalloyed			Stahl niedriglegiert Acier faibl. allié Steel low alloyed			Stahl hochlegiert Acier fortem. allié Steel high alloyed			Titan Titane Titanium		
Härte (HB) Dureté (HB) Hardness value (HB)	125–300			180–250			200–350			–		
Kategorie Catégorie Category	I			II			III			IV		
Bearbeitung Usinage Machining method	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼

Vorschübe (f) | Avances (f) | Feeds (f)

	f (mm/U mm/tr mm/rev)			f (mm/U mm/tr mm/rev)			f (mm/U mm/tr mm/rev)			f (mm/U mm/tr mm/rev)		
Stechdrehen Rainurage Grooving	0.01–0.03			0.01–0.03			0.01–0.03			0.01–0.03		
Längsdrehen Tournage Turning	0.03–0.1			0.03–0.1			0.03–0.1			0.03–0.1		

Schnitttiefen (max. a_p) | Profondeurs de passes (max. a_p) | Depths of cut (max. a_p)

Abhängig von Grösse, Schneidengeometrie und Werkstoff | Dépende de la grandeur, géométrie de coupe et matériau usiné | Depending from size, insert geometry an material

Schnittgeschwindigkeiten (v_c) | Vitesses de coupe (v_c) | Cutting speeds (v_c)

	v _c (m/min)			v _c (m/min)			v _c (m/min)			v _c (m/min)		
Schneidstoff Hartmetall Matériaux de coupe carbure Cutting material carbide	v _c (m/min)			v _c (m/min)			v _c (m/min)			v _c (m/min)		
UHM 30 HX	–	–	80–200	–	–	70–200	–	–	80–160	–	–	70–90

Werkstoffe | Matières | Materials

	Rostfreier Stahl Acier inoxydable Stainless steel			Rostfreier Stahl Acier inoxydable Stainless steel			Aluminium Aluminium Aluminium			Messing Laiton Brass		
Härte (HB) Dureté (HB) Hardness value (HB)	180–220			220–330			60–130			–		
Kategorie Catégorie Category	V			VI			VII			VIII		
Bearbeitung Usinage Machining method	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼

Vorschübe (f) | Avances (f) | Feeds (f)

	f (mm/U mm/tr mm/rev)			f (mm/U mm/tr mm/rev)			f (mm/U mm/tr mm/rev)			f (mm/U mm/tr mm/rev)		
Stechdrehen Rainurage Grooving	0.01–0.03			0.01–0.03			0.01–0.03			0.01–0.03		
Längsdrehen Tournage Turning	0.03–0.1			0.03–0.1			0.03–0.1			0.03–0.1		

Schnitttiefen (max. a_p) | Profondeurs de passes (max. a_p) | Depths of cut (max. a_p)

Abhängig von Grösse, Schneidengeometrie und Werkstoff | Dépende de la grandeur, géométrie de coupe et matériau usiné | Depending from size, insert geometry an material

Schnittgeschwindigkeiten (v_c) | Vitesses de coupe (v_c) | Cutting speeds (v_c)

	v _c (m/min)			v _c (m/min)			v _c (m/min)			v _c (m/min)		
Schneidstoff Hartmetall Matériaux de coupe carbure Cutting material carbide	v _c (m/min)			v _c (m/min)			v _c (m/min)			v _c (m/min)		
UHM 30 HX	–	–	80–160	–	–	40–80	–	–	100–800	–	–	80–700

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ANWENDUNGSBEREICHE DER SCHNEIDSTOFFSORTEN
DOMAINES D'APPLICATIONS DES MATÉRIAUX DE COUPE
APPLICATION RANGE OF CUTTING GRADES

MULTIDEC®-EASY BORE

214

UTILIS®
 Tooling for High Technology

Sorte Nuance Grade	Normbezeichnung Norme Norm	Zähigkeit des Schneidstoffs Tenacité du matériau de coupe Toughness of cutting grades	Härte (HB) Dureté (HB) Hardness value (HB)										Werkstoffe (Kategorie) Matières (Catégorie) Materials (Category)							
													125 – 300	180 – 250	200 – 350		180 – 220	220 – 330	60 – 130	
													Stahl unlegiert Acier non allié Steel non-alloyed (I)	Stahl niedrig legiert Acier faibl. allié Steel low alloyed (II)	Stahl hochlegiert Acier fortem. allié Steel high alloyed (III)	Titan Titane Titanium (IV)	Rostfreier Stahl Acier inoxydable Stainless steel (V)	Rostfreier Stahl Acier inoxydable Stainless steel (VI)	Aluminium Aluminium Aluminium (VII)	Messing Laiton Brass (VIII)
			01	05	10	15	20	25	30	35	40	45	50							
Hartmetall Carbure Carbide																				
UHM 30 HX	K 20/M 20																			

MULTIDEC®-SUPERBORE

Kurzbeschreibung Gamme de produits Product line		217																								
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Schnittdaten Données de coupe Cutting specification	<table><tr><th></th><th>Breit schneiden Large cut Large cut</th><th>Breit schneiden Large cut Large cut</th><th>Breit schneiden Large cut Large cut</th><th>Breit schneiden Large cut Large cut</th><th>Breit schneiden Large cut Large cut</th></tr><tr><td>Stirn (mm) Front (mm) Front (mm)</td><td>125 - 300</td><td>150 - 250</td><td>200 - 300</td><td>250 - 300</td><td>300 - 300</td></tr><tr><td>Empfehlung Recommendation Recommendation</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td></tr><tr><td>Bedienung Operation Operation</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr></table>		Breit schneiden Large cut Large cut	Breit schneiden Large cut Large cut	Breit schneiden Large cut Large cut	Breit schneiden Large cut Large cut	Breit schneiden Large cut Large cut	Stirn (mm) Front (mm) Front (mm)	125 - 300	150 - 250	200 - 300	250 - 300	300 - 300	Empfehlung Recommendation Recommendation	1	1	1	1	1	Bedienung Operation Operation	✓	✓	✓	✓	✓	224
	Breit schneiden Large cut Large cut	Breit schneiden Large cut Large cut	Breit schneiden Large cut Large cut	Breit schneiden Large cut Large cut	Breit schneiden Large cut Large cut																					
Stirn (mm) Front (mm) Front (mm)	125 - 300	150 - 250	200 - 300	250 - 300	300 - 300																					
Empfehlung Recommendation Recommendation	1	1	1	1	1																					
Bedienung Operation Operation	✓	✓	✓	✓	✓																					
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Multidec®-Superbore ist das optimale Werkzeug bei der Innenbearbeitung (Durchmesser 8–32 mm und Bohrungstiefen bis $2.25 \times D$).

Alle Wendeschneidplatten verfügen über zwei Schneiden und sind leicht auswechselbar. Zugleich bietet Multidec®-Superbore stabile scharfe sowie gerundete Schneidenkanten mit einem Radius von 0.2 bis 0.8 mm. Für die Bearbeitung aller gängigen Werkstoffe stehen ideal abgestimmte Hartmetallsorten (K10–P40), beschichtet und unbeschichtet, zur Verfügung. Die speziell entwickelte Spanleitstufe erlaubt eine optimale Spanbeherrschung beim Bohren sowie beim Längs- und Plandrehen.

Multidec®-Superbore, das ist ein Präzisionswerkzeug für drei Bearbeitungsverfahren und deshalb ideal bei wenig Werkzeugplätzen in der Maschine. Da weniger Werkzeugwechsel nötig sind, können die Fertigungskosten effektiv gesenkt werden.

Multidec®-Superbore, l'outil idéal pour l'usinage intérieur des diamètres allant de 8 à 32 mm. Différentes opérations de tournage avec un seul outil. Forer avec fond plat directement dans le plein, tournage intérieur, dressage de la face et enfin tournage extérieur, sont les atouts principaux de cet outil. Ces capacités de plongée sont de $1.5 \times D$ et de $2.25 \times D$, couvrant une grande famille de pièces de décolletage, mais également de mécanique. La géométrie du brise copeau assure une maîtrise parfaite de celui-ci et les plaquettes sont disponibles dans plusieurs grandeurs de rayons ainsi que dans de multiples nuances carbure aux revêtements CVD et PVD.

Multidec®-Superbore est un outil pour trois différentes opérations de travail. Quand il vous manquera de la place sur votre tourelle, pensez-y.

For ID-turning Multidec®-Superbore is the ideal cutting tool (diameters between 8 and 32 mm and deep holes up to $2.25 \times D$). All inserts have 2 cutting edges and are easily indexed and replaced. At the same time Multidec®-Superbore provides a very stable and sharp cutting edge with a radius between 0.2 and 0.8 mm. For cutting of all common materials there are ideal adjusted carbides inserts (K10–P40 coated and uncoated) available. The specific designed chip breaker allows an ideal chip flow for drilling, turning and facing.

This precision tool makes it possible to cover three machining operations in one tool and is consequently ideal for machines with few tool places. Because of less tool changes the production costs can be reduced significantly.



Vorteile

- 3 Bearbeitungsverfahren mit einem Werkzeug
 - Bohren ins Volle mit ebenem Bohrungsgrund
 - Längsdrehen (aussen und innen)
 - Plandrehen (aussen und innen)
- Innenbearbeitung
 - minimaler Durchmesser 8 mm
 - Bohrungstiefe bis 2.25D
- Stabile scharfe Schneiden
- Je nach Bearbeitung gut abgestimmte
 - Hartmetallsorten (K10–P40)
 - beschichtet und unbeschichtet
- Optimale Spanbeherrschung

Avantages

- 3 procédés d'usinage avec un seul outil
 - perçage dans le plein avec fond plat
 - tournage (intérieur + extérieur)
 - dressage (intérieur + extérieur)
- Usinage intérieur
 - diamètre minimal 8 mm
 - profondeur d'alésages jusqu'à 2.25D
- Arêtes de coupe vives et stables
- Pour chaque usinage une nuance optimale
 - nuances en carbure (K10–P40)
 - revêtues et non revêtues
- Parfaite maîtrise du copeau

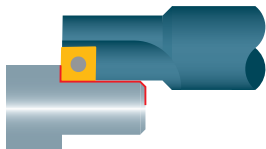
Advantages

- Three operations with one tool
 - drilling into solid material with flat bottom holes
 - long turning (ID- and OD turning)
 - face turning (ID- and OD turning)
- ID-turning
 - diameter minimum 8 mm
 - deep holes up to 2.25D
- Sharp and stable cutting edges
- Different carbides (K10–P40), coated and uncoated, are available
- Good chip breaking

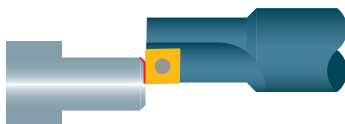
Längs- und Plandrehen
 Tournage et dressage
 Turning and facing

Plandrehen
 Dressage
 Facing

Schneiden | Plaquettes | Inserts □ 219...



Schneiden | Plaquettes | Inserts □ 219...



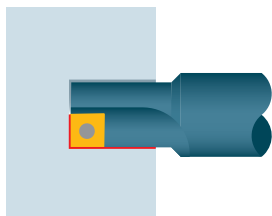
ANWENDUNGEN INNENDREHEN UND BOHREN
APPLICATIONS POUR LE TOURNAGE INTÉRIEUR ET PERÇAGE
APPLICATION ID TURNING AND DRILLING

Bohren ins Volle
 Perçage dans le plein
 Drilling into solid

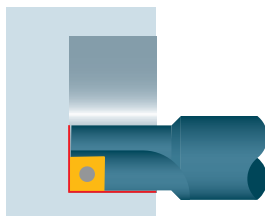
Längs- und Plandrehen
 Tournage et dressage
 Turning and facing

Längs- und Plandrehen
 Tournage et dressage
 Turning and facing

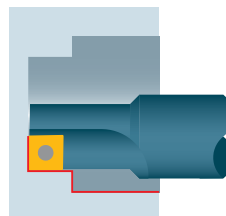
Schneiden | Plaquettes | Inserts □ 219...



Schneiden | Plaquettes | Inserts □ 219...



Schneiden | Plaquettes | Inserts □ 219...



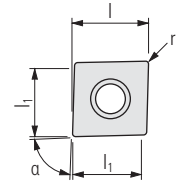
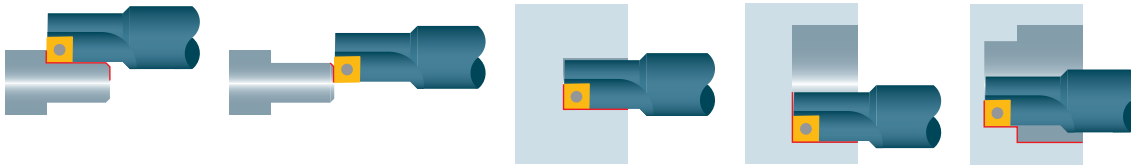
Halter | Porte-outils | Holders

□ 221...

Alle Abbildungen sind in rechter Ausführung dargestellt. Linke Ausführung auch lieferbar.

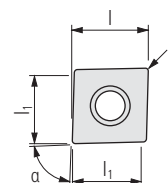
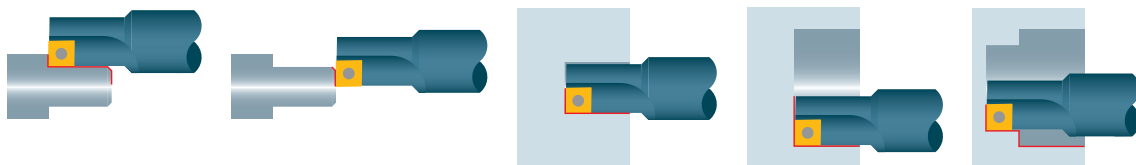
Toutes les illustrations représentent des exécutions à droite. Les exécutions à gauche sont aussi livrables.

All illustrations show right hand design. Left hand design is also available.

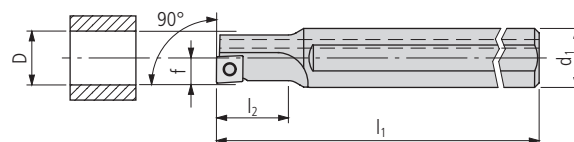
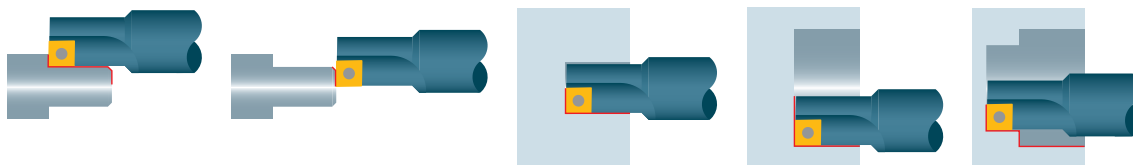


Typ Type Type	Ausführung Exécution Execution	Dimensionen Dimensions Dimensions				Bezeichnung Désignation Designation	Hartmetall Carbure Carbide					Halter Porte-outil Holder
		l	r	l ₁	α		228					
							—	—	●	●	●	
XCNT...							—	—	●	●	●	221...
							—	○	○	●	●	
							○	●	—	—	●	
							●	●	—	—	○	
							... UHM 10	... UHM 10 HX	... UHM 20 MZ	... UHM 30 MZ	... UHM 30 HX	
 -EL -EN -ER		4.5	0.2	4	88°	XCNT 040102 EL			■	■	■	MSB 08 ... 04
		4.5	0.4	4	88°	XCNT 040104 EL			■	■	■	MSB 08 ... 04
		5.8	0.2	5	88°	XCNT 050202 EN			■	■	■	MSB 10 ... 05
		5.8	0.4	5	88°	XCNT 050204 EN			■	■	■	MSB 10 ... 05
		6.5	0.2	6	88°	XCNT 060202 EN			■	■	■	MSB 12 ... 06
		6.5	0.4	6	88°	XCNT 060204 EN			■	■	■	MSB 12 ... 06
		7.6	0.4	7	88°	XCNT 070304 EN			■	■	■	MSB 14 ... 07
		8.5	0.4	8	88°	XCNT 080304 EN			■	■	■	MSB 16 ... 08
		9.6	0.4	9	88°	XCNT 09T304 EN			■	■	■	MSB 18 ... 09
		10.6	0.4	10	88°	XCNT 10T304 EN			■	■	■	MSB 20 ... 10
		10.6	0.8	10	88°	XCNT 10T308 EN			■	■	■	MSB 20 ... 10
		13.5	0.4	12.5	88°	XCNT 130404 EN			■	■	■	MSB 25 ... 13
		13.5	0.8	12.5	88°	XCNT 130408 EN			■	■	■	MSB 25 ... 13
		17.5	0.8	16	88°	XCNT 170508 EN			■	■	■	MSB 32 ... 17
		4.5	0.2	4	88°	XCNT 040102 ER			■	■	■	MSB 08 ... 04
		4.5	0.4	4	88°	XCNT 040104 ER			■	■	■	MSB 08 ... 04
 -TOP5*		8.5	0.4	8	88°	XCNT 080304 EN TOP5			□			MSB 16 ... 08
		9.6	0.4	9	88°	XCNT 09T304 EN TOP5			□			MSB 18 ... 09
		10.6	0.4	10	88°	XCNT 10T304 EN TOP5			□			MSB 20 ... 10
		10.6	0.8	10	88°	XCNT 10T308 EN TOP5			□			MSB 20 ... 10
		13.5	0.4	12.5	88°	XCNT 130404 EN TOP5			□			MSB 25 ... 13
		13.5	0.8	12.5	88°	XCNT 130408 EN TOP5			□			MSB 25 ... 13
		17.5	0.8	16	88°	XCNT 170508 EN TOP5			□			MSB 32 ... 17

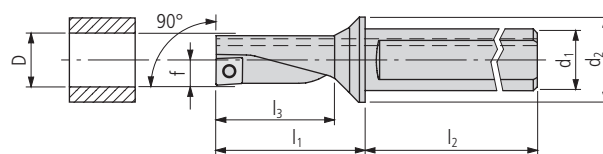
* Beschreibung TOP | Description TOP | Description TOP □ 17



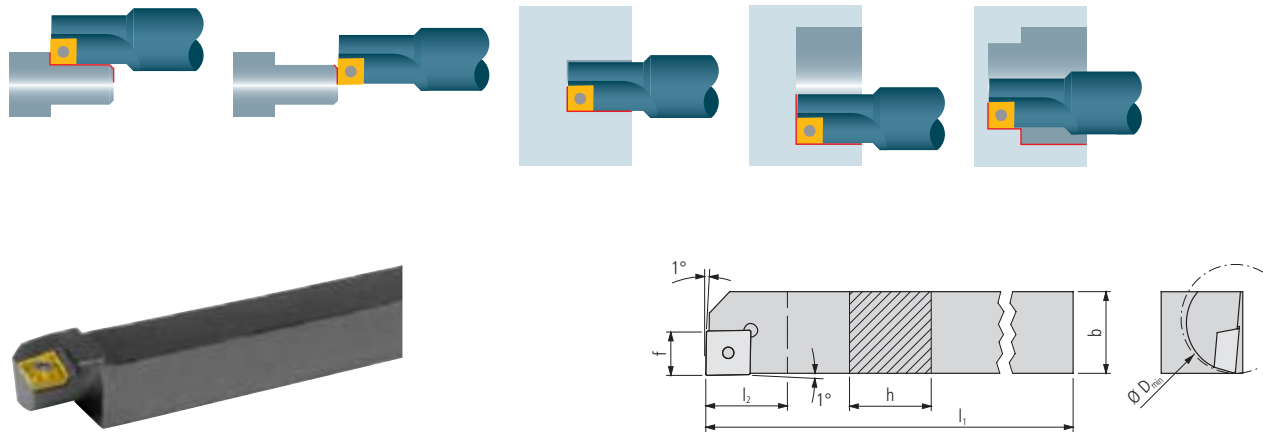
Typ Type Type	Ausführung Exécution Execution	Dimensionen Dimensions Dimensions				Bezeichnung Désignation Designation	Hartmetall Carbure Carbide					Halter Porte-outil Holder
		l	r	l ₁	α		—	—	●	●	●	
XCET...							—	—	●	●	●	□ 228 □ 221...
							—	○	○	—	—	
							○	●	—	—	—	
							●	●	—	—	○	
							—	—	—	—	—	
							UHM 10	UHM 10 HX	UHM 20 MZ	UHM 30 MZ	UHM 30 HX	
							...	...	...	...	...	
 -PA7	L	4.5	0.2	4	88°	XCET 040102 FL PA7	■	□				MSB 08 ... 04
		4.5	0.4	4	88°	XCET 040104 FL PA7	■	□				MSB 08 ... 04
	N	5.8	0.2	5	88°	XCET 050202 FN PA7	■	□				MSB 10 ... 05
		5.8	0.4	5	88°	XCET 050204 FN PA7	■	□				MSB 10 ... 05
		6.5	0.2	6	88°	XCET 060202 FN PA7	■	□				MSB 12 ... 06
		6.5	0.4	6	88°	XCET 060204 FN PA7	■	□				MSB 12 ... 06
		7.6	0.4	7	88°	XCET 070304 FN PA7	■	□				MSB 14 ... 07
		8.5	0.4	8	88°	XCET 080304 FN PA7	■	□				MSB 16 ... 08
		9.6	0.4	9	88°	XCET 09T304 FN PA7	■	□				MSB 18 ... 09
		10.6	0.4	10	88°	XCET 10T304 FN PA7	■	□				MSB 20 ... 10
		10.6	0.8	10	88°	XCET 10T308 FN PA7	■	□				MSB 20 ... 10
		13.5	0.4	12.5	88°	XCET 130404 FN PA7	■	□				MSB 25 ... 13
		13.5	0.8	12.5	88°	XCET 130408 FN PA7	■	□				MSB 25 ... 13
		17.5	0.8	16	88°	XCET 170508 FN PA7	■	□				MSB 32 ... 17
	R	4.5	0.2	4	88°	XCET 040102 FR PA7	■	□				MSB 08 ... 04
		4.5	0.4	4	88°	XCET 040104 FR PA7	■	□				MSB 08 ... 04
 -TOP7*	L	4.5	0.2	4	88°	XCET 040102 FL TOP7	□	□				MSB 08 ... 04
		4.5	0.4	4	88°	XCET 040104 FL TOP7	□	□				MSB 08 ... 04
	N	5.8	0.2	5	88°	XCET 050202 FN TOP7	□	□				MSB 10 ... 05
		5.8	0.4	5	88°	XCET 050204 FN TOP7	□	□				MSB 10 ... 05
		6.5	0.2	6	88°	XCET 060202 FN TOP7	□	□				MSB 12 ... 06
		6.5	0.4	6	88°	XCET 060204 FN TOP7	□	□				MSB 12 ... 06
		7.6	0.4	7	88°	XCET 070304 FN TOP7	□	□				MSB 14 ... 07
		8.5	0.4	8	88°	XCET 080304 FN TOP7	□	□				MSB 16 ... 08
		9.6	0.4	9	88°	XCET 09T304 FN TOP7	□	□				MSB 18 ... 09
		10.6	0.4	10	88°	XCET 10T304 FN TOP7	□	□				MSB 20 ... 10
		10.6	0.8	10	88°	XCET 10T308 FN TOP7	□	□				MSB 20 ... 10
		13.5	0.4	12.5	88°	XCET 130404 FN TOP7	□	□				MSB 25 ... 13
		13.5	0.8	12.5	88°	XCET 130408 FN TOP7	□	□				MSB 25 ... 13
		17.5	0.8	16	88°	XCET 170508 FN TOP7	□	□				MSB 32 ... 17
	R	4.5	0.2	4	88°	XCET 040102 FR TOP7	□	□				MSB 08 ... 04
		4.5	0.4	4	88°	XCET 040104 FR TOP7	□	□				MSB 08 ... 04



Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions							Schneiden Plaquettes Inserts	
				D	d ₁	l ₁	l ₂	f				
1.5D = (l₂)											□ 219...	
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
MSB 08 L 1.5D 04	■	MSB 08 R 1.5D 04	■	8	12	80	12	4			XC..T 04....	
MSB 10 L 1.5D 05	■	MSB 10 R 1.5D 05	■	10	12	90	15	5			XC..T 05....	
MSB 12 L 1.5D 06	■	MSB 12 R 1.5D 06	■	12	16	100	18	6			XC..T 06....	
MSB 14 L 1.5D 07	■	MSB 14 R 1.5D 07	■	14	16	110	21	7			XC..T 07....	
MSB 16 L 1.5D 08	■	MSB 16 R 1.5D 08	■	16	20	125	24	8			XC..T 08....	
MSB 18 L 1.5D 09	■	MSB 18 R 1.5D 09	■	18	25	135	27	9			XC..T 09....	
MSB 20 L 1.5D 10	■	MSB 20 R 1.5D 10	■	20	25	150	30	10			XC..T 10....	
MSB 25 L 1.5D 13	■	MSB 25 R 1.5D 13	■	25	32	180	37.5	12.5			XC..T 13....	
MSB 32 L 1.5D 17	■	MSB 32 R 1.5D 17	■	32	40	200	48	16			XC..T 17....	



Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions							Schneiden Plaquettes Inserts	
				D	d ₁	d ₂	l ₁	l ₂	l ₃	f		
2.25D = (l₃)											□ 219...	
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
MSB 08 L 2.25D 04	■	MSB 08 R 2.25D 04	■	8	10	12	22	38	18	4	XC..T 04....	
MSB 10 L 2.25D 05	■	MSB 10 R 2.25D 05	■	10	12	16	27.5	42	22.5	5	XC..T 05....	
MSB 12 L 2.25D 06	■	MSB 12 R 2.25D 06	■	12	16	20	33	45	27	6	XC..T 06....	
MSB 14 L 2.25D 07	■	MSB 14 R 2.25D 07	■	14	16	20	38.5	45	31.5	7	XC..T 07....	
MSB 16 L 2.25D 08	■	MSB 16 R 2.25D 08	■	16	20	25	44	50	36	8	XC..T 08....	
MSB 18 L 2.25D 09	■	MSB 18 R 2.25D 09	■	18	25	32	53.5	56	40.5	9	XC..T 09....	
MSB 20 L 2.25D 10	■	MSB 20 R 2.25D 10	■	20	25	32	55	56	45	10	XC..T 10....	
MSB 25 L 2.25D 13	■	MSB 25 R 2.25D 13	■	25	32	40	69	60	56.5	12.5	XC..T 13....	
MSB 32 L 2.25D 17	■	MSB 32 R 2.25D 17	■	32	40	50	88	70	72	16	XC..T 17....	



Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions							Schneiden Plaquettes Inserts	
EC...				h	b	l ₁	l ₂	f	D _{min}		219...	
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
EC L 1212 H06-20	■	EC R 1212 H06-20	■	12	12	100	10	6	20		XC..T06...	
EC L 1212 H06-15	■	EC R 1212 H06-15	■	12	12	100	10	6	15		XC..T06...	

Abbildung Illustration Illustration	Bezeichnung Désignation Designation	Dimensionen Dimensions Dimensions	Beschreibung Description Description	Halter Porte-outil Holder
	MSP 18034 T06	M1.8 × 3.4 T06	Torxschraube Vis torx Torx screw	MSB 08 ... 04
	MSP 20040 T06	M2.0 × 4.0 T06		MSB 10 ... 05
	MSP 22050 T07	M2.2 × 5.0 T07		MSB 12 ... 06
	MSP 25060 T08	M2.5 × 6.0 T08		MSB 14 ... 07
	MSP 30073 T08	M3.0 × 7.3 T08		MSB 16 ... 08/ MSB 18 ... 09
	MSP 35086 T15	M3.5 × 8.6 T15		MSB 20 ... 10
	MSP 45105 T20	M4.5 × 10.5 T20	Torxschlüssel Tournevis torx Torx screwdriver	MSB 25 ... 13/ MSB 32 ... 17
	MSP TX06	T06		MSB 08 ... 04/ MSB 10 ... 05
	MSP TX07	T07		MSB 12 ... 06
	MSP TX08	T08		MSB 14 ... 07/ MSB 16 ... 08/ MSB 18 ... 09
	MSP TX15	T15		MSB 20 ... 10
	MSP TX20	T20		MSB 25 ... 13 / MSB 32 ... 17
	MSP TX06 D	T06 (0.6 Nm)	Drehmoment-Torxschlüssel Tournevis à serrage contrôlé Torquedriver	MSB 08 ... 04/ MSB 10 ... 05
	MSP TX07 D	T07 (0.9 Nm)		MSB 12 ... 06
	MSP TX08 D	T08 (1.2 Nm)		MSB 14 ... 07/ MSB 16 ... 08/ MSB 18 ... 09
	MSP TX15 D	T15 (3 Nm)		MSB 20 ... 10

Werkstoffe | Matières | Materials

	Stahl unlegiert Acier non allié Steel unalloyed			Stahl niedriglegiert Acier faibl. allié Steel low alloyed			Stahl hochlegiert Acier fortem. allié Steel high alloyed			Titan Titane Titanium		
Härte (HB) Dureté (HB) Hardness value (HB)	125–300			180–250			200–350			–		
Kategorie Catégorie Category	I			II			III			IV		
Bearbeitung Usinage Machining method	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼

Schnittgeschwindigkeiten (v_c) | Vitesses de coupe (v_c) | Cutting speeds (v_c)

	v _c (m/min)			v _c (m/min)			v _c (m/min)			v _c (m/min)		
Schneidstoff Hartmetall Matériaux de coupe carbure Cutting material carbide												
UHM 10	–	–	–	–	–	–	–	–	–	–	–	40–80
UHM 10 HX	–	–	–	–	–	–	–	–	–	40–60	50–90	60–140
UHM 20 MZ	100–180	120–220	150–300	80–140	90–160	120–200	60–120	80–140	110–180	–	–	–
UHM 30 MZ	80–150	100–180	140–280	70–120	80–150	100–180	60–120	80–150	100–180	–	–	–
UHM 30 HX	60–130	80–160	120–250	60–100	60–130	80–160	50–100	80–140	100–160	20–50	40–80	50–120

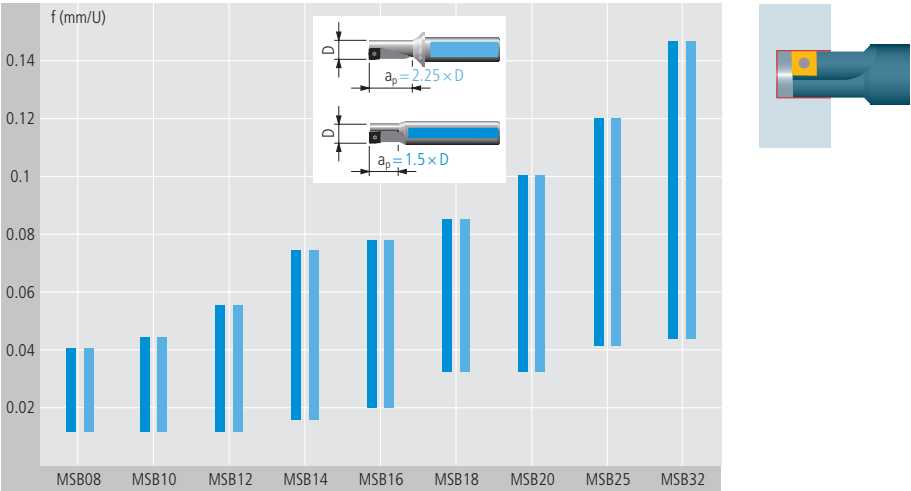
Werkstoffe | Matières | Materials

	Rostfreier Stahl Acier inoxydable Stainless steel			Rostfreier Stahl Acier inoxydable Stainless steel			Aluminium Aluminium Aluminium			Messing Laiton Brass		
Härte (HB) Dureté (HB) Hardness value (HB)	180–220			220–330			60–130			–		
Kategorie Catégorie Category	V			VI			VII			VIII		
Bearbeitung Usinage Machining method	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼

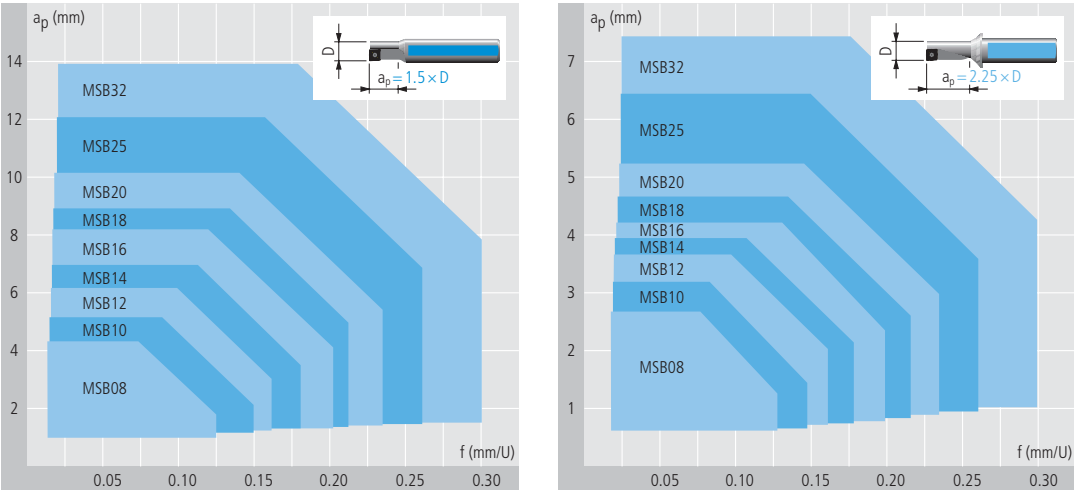
Schnittgeschwindigkeiten (v_c) | Vitesses de coupe (v_c) | Cutting speeds (v_c)

	v _c (m/min)			v _c (m/min)			v _c (m/min)			v _c (m/min)		
Schneidstoff Hartmetall Matériaux de coupe carbure Cutting material carbide												
UHM 10	–	–	–	–	–	–	100–300	100–400	100–400	100–300	100–400	100–400
UHM 10 HX	–	50–90	60–140	–	30–50	30–70	100–300	100–500	100–500	100–300	100–500	100–500
UHM 20 MZ	100–180	120–220	–	–	–	–	–	–	–	–	–	–
UHM 30 MZ	60–150	80–150	100–200	–	40–70	50–100	–	–	–	–	–	–
UHM 30 HX	50–100	50–180	80–200	30–50	40–90	50–100	–	100–500	100–500	–	100–500	100–500

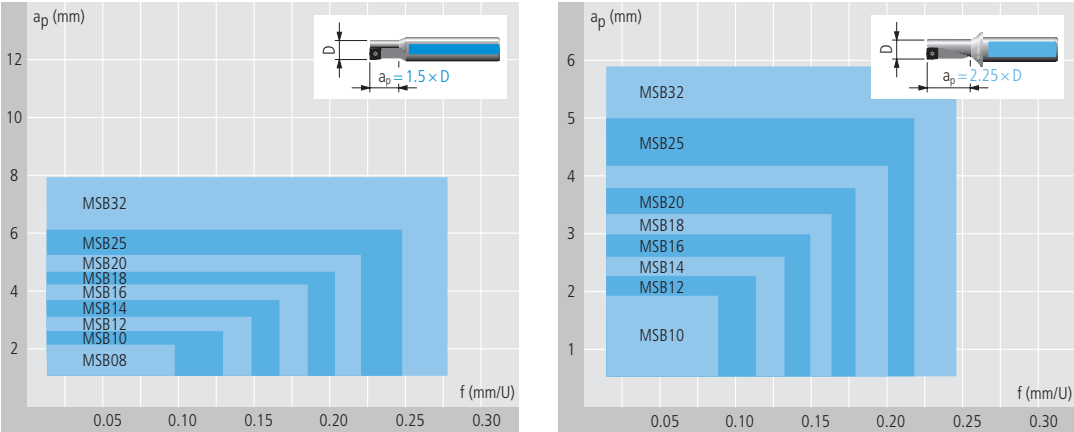
Vorschübe beim Bohren | Avance de perçage | Feed for drilling



Schnitttiefen/Vorschübe beim Längsdrehen | Profondeurs de passe/avances de chariotage | Cutting depth/feed for longitudinal turning

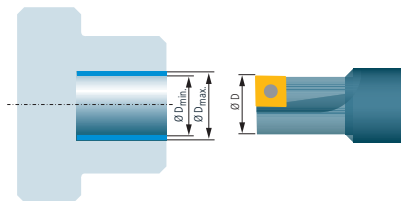


Schnitttiefen/Vorschübe beim Plandrehen | Profondeurs de passe/avances de dressage de face | Cutting depth/feed for face turning



Bohren ausser Mitte

Die spezielle konstruktive Auslegung von Werkzeug und Wendeplatte ermöglicht, mit Multidec®-Superbore-Werkzeugen ausser Mitte zu bohren. Gemäss untenstehender Tabelle können somit entsprechende Abweichungen zum Werkzeug-nennndurchmesser erzielt werden.



Perçage excentré

Du fait de la conception spéciale de l'outil et de la plaquette, les outils Multidec®-Superbore permettent de procéder à un perçage excentré. Ceci peut conduire à des écarts par rapport au diamètre nominal de l'outil (voir tableau ci-dessus).

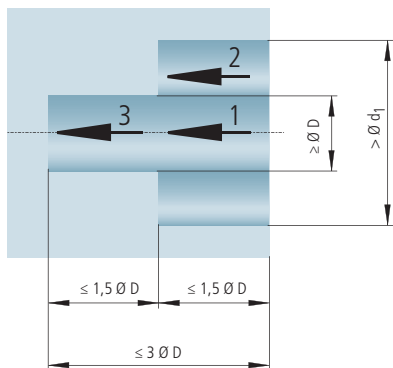
Off-centered drilling

Due to the special construction of Multidec®-Superbore tools and indexable inserts off-centered drilling is possible. Thus desired deviations from the tools nominal diameter can be obtained (see table below).

Werkzeugtyp Type d'outil Type of tool	Werkzeug-Nennndurchmesser Ø nominal d'outil Nominal tool Ø	Werkstück-Bohrdurchmesser Ø percé sur la pièce Workpiece bore diameter	
		Ø D _{min}	Ø D _{max}
MSB 08 L/R-... 04	8	7.85	8.3
MSB 10 L/R-... 05	10	9.85	10.5
MSB 12 L/R-... 06	12	11.85	12.5
MSB 14 L/R-... 07	14	13.85	14.5
MSB 16 L/R-... 08	16	15.85	16.5
MSB 18 L/R-... 09	18	17.85	18.5
MSB 20 L/R-... 10	20	19.8	20.5
MSB 25 L/R-... 13	25	24.8	25.8
MSB 32 L/R-... 17	32	31.8	33

Tiefe Bohrungen bis 3 × D

Mit Multidec®-Superbore MSB 1.5D können, bei entsprechender Werkstückkontur, Bohrungen bis zum Dreifachen des Nennndurchmessers bearbeitet werden. Operationsreihenfolge 1, 2 und 3 beachten!

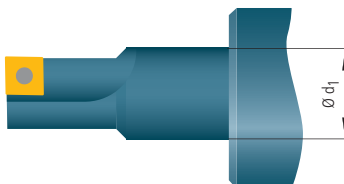


Alésages profonds jusqu'à 3 × D

Lorsque le contour de la pièce s'y prête, l'outil Multidec®-Superbore MSB 1.5D permet d'usiner des alésages d'une profondeur équivalente à trois fois les diamètres nominaux maximum (voir figure). Respectez la suite des opérations 1, 2 et 3!

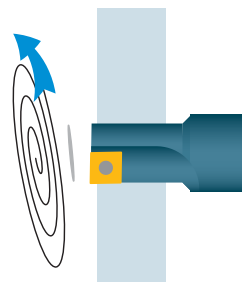
Deep holes up to 3 times D

With a stepped workpiece bore it is possible to achieve, with the tool MSB 1.5D, a resulting depth of up to 3 times the diameter. To reach this result the operation sequences 1, 2 and 3 need to be followed as shown!



Durchgangsbohrung

Bei Durchgangsbohrungen fällt am Ende des Bohrvorgangs eine scharfkantige Scheibe ab, die durch die Bearbeitungsbewegung weggeschleudert werden kann. Deshalb sind unbedingt Sicherheitsvorkehrungen notwendig.



Alésages débouchants

Lors des alésages débouchants, un disque tranchant sera éjecté. Prendre les mesures de sécurité nécessaires.

Through holes

With through holes a sharp-edge disk is created as tool break-out occurs. Because of possible centrifugation force safety measures are absolutely necessary.

Einbau der Wendeschneidplatte

Für Multidec®-Superbore-Werkzeuge mit Ø 8 mm werden rechte und linke Wendeschneidplatten benötigt. Von Ø 10–32 mm kommen neutrale Wendeschneidplatten zum Einsatz.



Linkes Werkzeug
Outil à gauche
Left hand tool



Rechtes Werkzeug
Outil à droite
Right hand tool

Montage de la plaquette

Les outils Ø 8 mm requièrent l'utilisation de plaquettes gauches et droites. Pour les diamètres de 10 à 32 mm, on fait appel à des plaquettes neutres.

Assembly of inserts

For tools dia. 8 mm right and left hand inserts are required (dependent upon direction of tool). From dia. 10–32 mm neutral inserts are utilized.

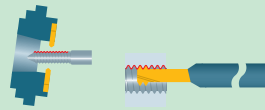
Sorte Nuance Grade	Normbezeichnung Norme Norm	Zähigkeit des Schneidstoffs Tenacité du matériau de coupe Toughness of cutting grades																Werkstoffe (Kategorie) Matières (Catégorie) Materials (Category)												
		Härte (HB) Dureté (HB) Hardness value (HB) 																125 – 300	180 – 250	200 – 350	Titan Titane Titanium (IV)		Rostfreier Stahl Acier inoxydable Stainless steel (V)		Rostfreier Stahl Acier inoxydable Stainless steel (VI)		Aluminium Aluminium Aluminium (VII)		Messing Laiton Brass (VII)	
		01	05	10	15	20	25	30	35	40	45	50	Stahl unlegiert Acier non allié Steel non-alloyed (I)		Stahl niedrig legiert Acier faibl. allié Steel low alloyed (II)		Stahl hochlegiert Acier fortem. allié Steel high alloyed (III)		Titan Titane Titanium (IV)		Rostfreier Stahl Acier inoxydable Stainless steel (V)		Rostfreier Stahl Acier inoxydable Stainless steel (VI)		Aluminium Aluminium Aluminium (VII)		Messing Laiton Brass (VII)			
Hartmetall Carbure Carbide																														
UHM 10	K 10/M 10													■	○	○	○	○	○	○	○	○	○	●	●	●	●	●		
UHM 10 HX	K 10/M 10													●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
UHM 20 MZ	P 25													●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
UHM 30 MZ	P 35/M 35													●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
UHM 30 HX	K 20/M 20													●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	

MULTIDEC®-WHIRLING

Kurzbeschreibung
Gamme de produits
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Application



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Tourbillonnage (extérieur) – système et assemblage
Threadwhirling (outside) – system and mounting



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Wirbelkopf, Adapter und Gewindewirbelring
Tête a tourbillonner, Adaptateur et anneau de tourbillonnage
Whirling tool, Adapter and whirling ring



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Application range of cutting grades

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Schnittdaten
Données de coupe
Cutting specification

	Schnittgruppen avec une HSS Haut vitesse (HSS)	Schnittgruppen avec une HSS Haut vitesse (HSS)	Schnittgruppen avec une HSS Haut vitesse (HSS)	Schnittgruppen avec une HSS Haut vitesse (HSS)
Grundeinstellung Réglage de base	125 – 200	150 – 250	200 – 250	–
Empfehlung Recommandation	1	1	1	1
Beispielwerte Exemples de valeurs	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓

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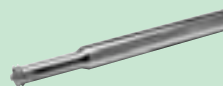
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Gewindefräser (innen)
Fraise de filetage (intérieur)
Thread milling tool (inside)



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Schnittdaten
Données de coupe
Cutting specification

	Schnittgruppen avec une HSS Haut vitesse (HSS)	Schnittgruppen avec une HSS Haut vitesse (HSS)	Schnittgruppen avec une HSS Haut vitesse (HSS)	Schnittgruppen avec une HSS Haut vitesse (HSS)
Grundeinstellung Réglage de base	125 – 200	150 – 250	200 – 250	–
Empfehlung Recommandation	1	1	1	1
Beispielwerte Exemples de valeurs	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓

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Anwendungsbereiche der Schneidstoffsorten
Domaines d'applications des matériaux de coupe
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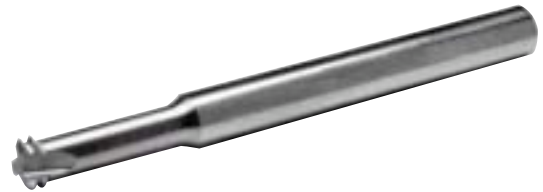
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Multidec®-Whirling ist ein mehrschneidiges Gewindewirbel-Werkzeugsystem, welches dazu dient, die Produktivität bei der Herstellung von Gewinden signifikant zu steigern. Im Gegensatz zum Gewindedrehen mit mehreren nötigen Schneiddurchgängen, wird beim Gewindewirbeln in einem Durchgang das Gewinde fertig gestellt. Durch bis zu 12 Schneiden kann die Bearbeitungszeit erheblich verkürzt werden.

Multidec®-Whirling est un système de tourbillonnage avec plusieurs plaquettes qui permet d'augmenter significativement la production. Contrairement au peignage qui nécessite plusieurs passages, le tourbillonnage permet de réaliser en un passage le filet complet. Les 12 plaquettes réduisent le temps d'usinage notamment.

Multidec® Thread Whirling is a multiple cutter tool system to significantly improve productivity. Which is essential in today's mass production. Unlike single point threading which requires multiple passes, thread whirling usually produces a finished thread with a single pass. Improvements are realized in increased productivity and improved surface finish quality by using the 12 insert Multidec Whirling System.



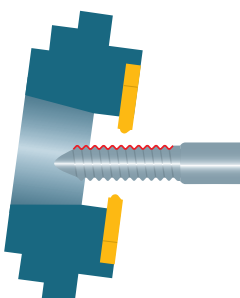
ANWENDUNGEN
APPLICATIONS
APPLICATION

MULTIDEC®-WHIRLING

Gewindewirbeln (aussen)
 Tourbillonnage (extérieur)
 Threadwhirling (outside)

Werkzeug | Outil | Tool

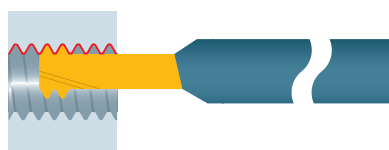
□ 234...



Gewindefräsen, Vollprofil (innen) – 2 Zahnreihen
 Filetage, profil complet (intérieur) – 2 filets
 Threading, full profile (inside) – 2 teeth

Werkzeug | Outil | Tool

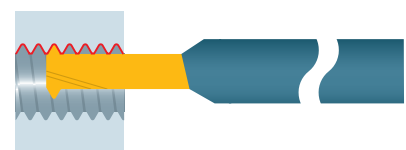
□ 248...



Gewindefräsen, Vollprofil (innen) – 1 Zahnreihe
 Filetage, profil complet (intérieur) – 1 filet
 Threading, full profile (inside) – 1 tooth

Werkzeug | Outil | Tool

□ 250...



Besonderheiten und Vorteile

- bis zu 12 Wendeplatten steigern die Produktivität signifikant und reduzieren Vibrationen erheblich
- geringe Rundlauffehler und hohe Wechselgenauigkeit der Platte $< \pm 0.005$ mm garantieren hochwertige Gewinde
- schneller und problemloser Wechsel des Wirbelwerkzeugs senkt die Rüstzeit
- gratfreie Gewindeprofile vermindern Nachbehandlungen
- Verwendung von UTILIS Standard-Rohlingen ermöglicht kurze Lieferzeiten mit optimal auf das zu zerspanende Material abgestimmten Beschichtungen
- Wirbelköpfe mit verschiedenen Flugkreisen sowie für mehrgängige Gewinde erhältlich

Particularités et avantages

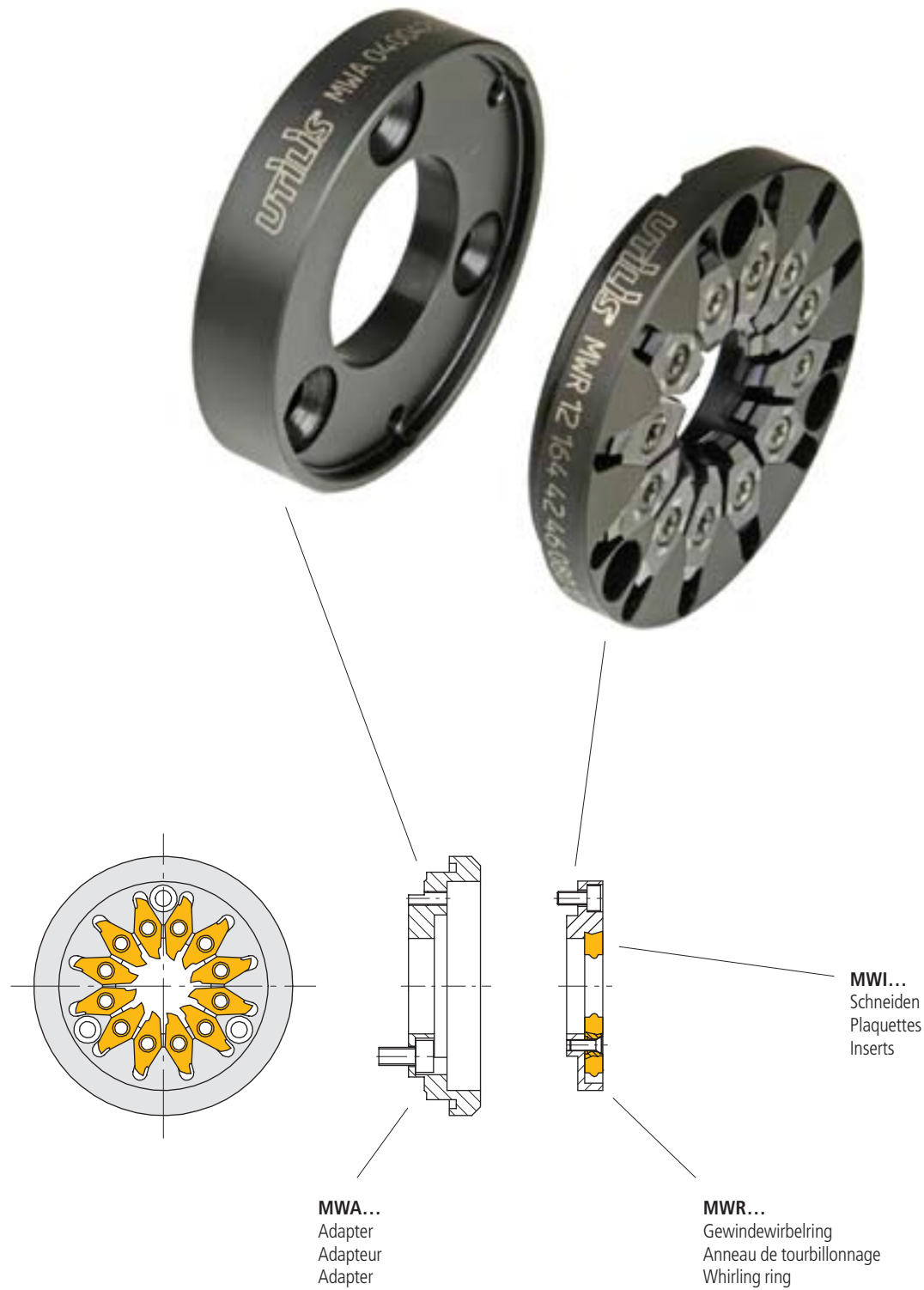
- jusqu'à 12 copeaux, pour une augmentation de la productivité et une forte réduction des vibrations
- excellente concentricité et grande répétitivité lors du changement des plaquettes, $< \pm 0.005$ mm pour les filets de haute précision
- changement rapide de la tête à tourbillonner, baisse du temps de la mise en train
- profil du filet sans bavures, ne nécessite pas de traitements supplémentaires
- L'utilisation d'ébauches standard chez Utilis, permet d'offrir de courts délais de livraisons
- optimisation des performances, grâce à la palette de revêtements couche mince
- différents diamètres de têtes et exécutions à plusieurs filets sont disponibles

Specialities and advantage

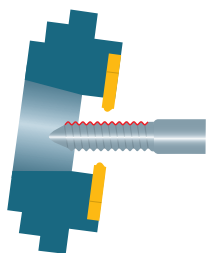
- up to 12 inserts increase productivity and reduce vibration considerably
- little concentricity tolerance and high exchange accuracy of inserts $< \pm 0.005$ mm guarantee threads of high-quality
- quick and simple change of the Whirling tool reduces set up time
- threads without cutting ridge decrease re-machining of parts
- using UTILIS standard blanks allows short delivery time and best possible coating for demanded application
- whirling tools with different flight circles and multi start threads available



MWT...



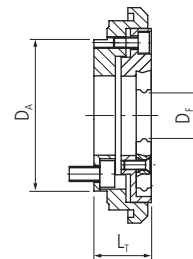
Gewindewirbeln (aussen) | Tourbillonnage (extérieur) | Threadwhirling (outside)



A

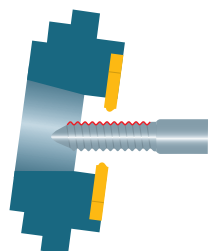


B



Maschinen-Typ Types de machines Type of machine		Angetriebenes Werkzeug Outil entraîné Driven toolholder		Dimensionen Dimensions Dimensions			Schneidezah Nbr. de dents No. of teeth	Bezeichnung Désignation Designation	Typ Type Type	
				D _A	D _F	L _T				
MWT...										
CITIZEN	C16 M12/16/20	PCM	LSW-424	35	12	16.9	9	MWT12 164 3546 169 09	■	A
							12	MWT12 164 3546 169 12	■	A
	K12/16	PCM	GSW-101	20	6	16.5	7	MWT06 164 2035 165 07	■	B
							9	MWT06 164 2035 165 09	■	B
						22.5	7	MWT06 164 2035 225 07	■	B
							9	MWT06 164 2035 225 09	■	B
	L20/25/30/32	PCM	KSW-101 LSW-215 LSW-101 MSW-101	40	12	13	9	MWT12 164 4046 130 09	■	A
							12	MWT12 164 4046 130 12	■	A
	L25/32	JARVIS (CHS-1B6)	LTR 0128 LTR 0132 LTR 0139 LTR 0168 LTR 0183	40	12	12.1	9	MWT12 164 4053 121 09	□	A
							12	MWT12 164 4053 121 12	□	A
						13.1	9	MWT12 166 4053 131 09	□	A
							12	MWT12 166 4053 131 12	□	A
	M1-20 M316	JARVIS (CHS-2B6)	LTR0131 LTR0169 LTR0170	37	12	12.1	9	MWT12 164 3746 121 09	□	A
							12	MWT12 164 3746 121 12	□	A
MAIER	ML20 D/E	WTO	2-020-W15-2000	40	12	24	9	MWT12 164 4046 240 09	□	A
							12	MWT12 164 4046 240 12	□	A
	ML20/26	WTO	2-020-W45-3001	40	15	14	12	MWT15 164 4044 140 12	□	B
					12	13.5	12	MWT12 164 4044 135 12	□	A
MONNIER + ZÄHNER	M621			85	15	13.5	12	MWT15 164 4044 135 12	□	A
					6	29.5	9	MWT06 164 85128 295 09	□	A
					12	29.5	9	MWT12 164 85128 295 09	□	A
					12	MWT12 164 85128 295 12	□	A		
NEXTURN	SA20/26/32	PCM	NESA-32	40	12	17.2	9	MWT12 164 4046 172 09	■	A
							12	MWT12 164 4046 172 12	■	A

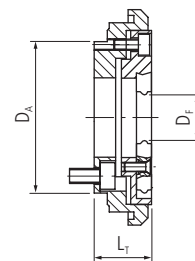
Gewindewirbeln (aussen) | Tourbillonnage (extérieur) | Threadwhirling (outside)



A

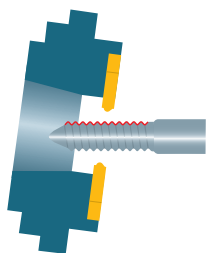


B



Maschinen-Typ Types de machines Type of machine		Angetriebenes Werkzeug Outil entraîné Driven toolholder		Dimensionen Dimensions Dimensions			Schneidezahl Nbr. de dents No. of teeth	Bezeichnung Désignation Designation			Typ Type Type		
				D _A	D _F	L _T							
		MWT...											
STAR	ECAS20	PCM	E20-WI	20	6	16.5	7	MWT06 164 2035 165 07	■	B			
							9	MWT06 164 2035 165 09	■	B			
	SR/SV ECAS	STAR	541-78 (±10°) 681-72 (±20°)	40	12	17	9	MWT12 164 4045 170 09	■	A			
							12	MWT12 164 4045 170 12	■	A			
	SR ECAS	SU-matic	AWS 1:1	40	12	12	9	MWT12 164 4045 120 09	■	A			
							12	MWT12 164 4045 120 12	■	A			
						17	9	MWT12 164 4045 170 09	■	A			
							12	MWT12 164 4045 170 12	■	A			
	SR20	EPPINGER	7.074.260	42	12	33.5	12	MWT12 164 4253 335 12	□	B			
	SR/SV	STAR	421-73 (±10°) 431-72 (±10°) 581-71 (±10°)	40	12	12	9	MWT12 164 4045 120 09	■	A			
							12	MWT12 164 4045 120 12	■	A			
	SV	WTO	TN762004	42	12	10.5	12	MWT12 164 4244 105 12	■	B			
						20.5	12	MWT12 164 4244 205 12	□	B			
						30.5	12	MWT12 164 4244 305 12	□	B			
TORNOS	Deco 10	TORNOS	305115 (3650)	M14	6	44	7	MWT06 164 M1435 440 07	■	B			
			305217				42	6	11.5	7	MWT06 164 4242 115 07	■	A
									9	MWT06 164 4242 115 09	■	A	
									7	MWT06 164 4242 135 07	■	A	
	9	MWT06 164 4242 135 09		■	A								
	Deco 13	MADAULA	9999.0444	40	12	11.5	9	MWT12 164 4055 115 09	■	A			
							12	MWT12 164 4055 115 12	■	A			
	Deco 13	PCM	GW-TDM-D13	40	12	10.3	9	MWT12 164 4055 103 09	■	A			
							12	MWT12 164 4055 103 12	■	A			
	Deco 13 Deco 20 Gamma 20	TORNOS	307087 306101	40	12	10.5	9	MWT12 164 4057 105 09	■	A			
							12	MWT12 164 4057 105 12	■	A			
							9	MWT12 164 4057 175 09	■	A			
							12	MWT12 164 4057 175 12	■	A			
						20.5	9	MWT12 164 4057 205 09	■	A			
							12	MWT12 164 4057 205 12	■	A			
							9	MWT15 164 4057 105 09	■	A			
							12	MWT15 164 4057 105 12	■	A			
	Sigma 20	TORNOS	417627	50	12	12	9	MWT12 164 5067 120 09	■	A			
12							MWT12 164 5067 120 12	■	A				

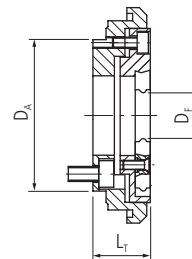
Gewindewirbeln (aussen) | Tourbillonnage (extérieur) | Threadwhirling (outside)



A

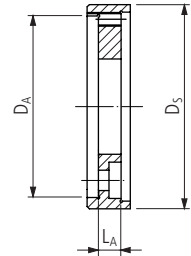
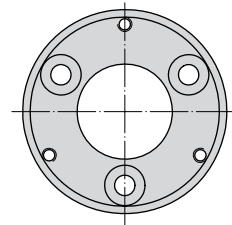
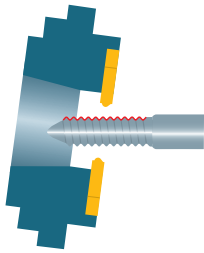


B



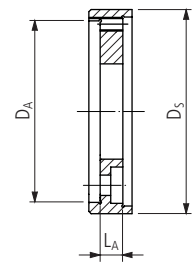
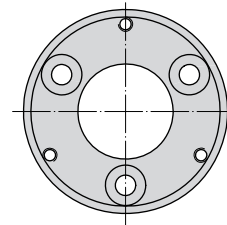
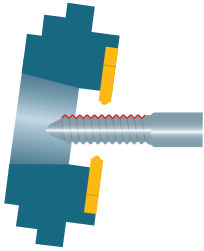
Maschinen-Typ Types de machines Type of machine		Angetriebenes Werkzeug Outil entraîné Driven toolholder		Dimensionen Dimensions Dimensions			Schneidezahl Nbr. de dents No. of teeth	Bezeichnung Désignation Designation	Typ Type Type	
				D _A	D _F	L _T				
MWT...										
TRAUB	TNL12	TRAUB	987 320	37	12	6.8	12	MWT12 164 3776 068 12	■	B
			989 520	M34	6	19.4	7	MWT06 164 M3442 194 07	□	A
							9	MWT06 164 M3442 194 09	□	A
			987 910	28	6	17.9	7	MWT06 164 2842 179 07	□	A
	9	MWT06 164 2842 179 09					□	A		
	TNL18	TRAUB	984 770, 984 769 W7045 009	41	12	6.5	12	MWT12 164 4158 065 12	□	B
					15	6.5	12	MWT15 164 4158 065 12	□	B
	TNL26	TRAUB		54	12	11	9	MWT12 164 54106 110 09	■	A
					12	11	12	MWT12 164 54106 110 12	■	A
					15	11	9	MWT15 164 54106 110 09	■	A
							12	MWT15 164 54106 110 12	■	A
	25	11	12	MWT25 166 54106 110 12	■	A				
			TNL26 K	TRAUB		41	12	8	12	MWT12 164 4158 080 12
TSUGAMI	BH20/38	TSUGAMI		52	12	22	9	MWT12 164 5265 220 09	■	A
							12	MWT12 164 5265 220 12	■	A
	BS20/26	TSUGAMI		50	12	21	9	MWT12 164 5062 210 09	□	A
							12	MWT12 164 5062 210 12	■	A
	BU20/26	TSUGAMI		52	12	16.6	9	MWT12 164 5265 166 09	■	A
							12	MWT12 164 5265 166 12	■	A
	SS20	TSUGAMI		52	12	16.6	9	MWT12 164 5264 166 09	□	A
							12	MWT12 164 5264 166 12	□	A
	NP16	PCM	MSW-101	40	12	13	9	MWT12 164 4046 130 09	■	A
							12	MWT12 164 4046 130 12	■	A
Bearbeitungszentren Centres d'usinage Machining centers		HSK40 A		HSK40 A	12	95	9	MWT12 164 2646 0950 09 HSK40 A	□	A
							12	MWT12 164 2646 0950 12 HSK40 A	□	A
		HSK40 E		HSK40 E			9	MWT12 164 2646 0950 09 HSK40 E	□	A
							12	MWT12 164 2646 0950 12 HSK40 E	□	A

Gewindewirbeln (aussen) | Tourbillonnage (extérieur) | Threadwhirling (outside)



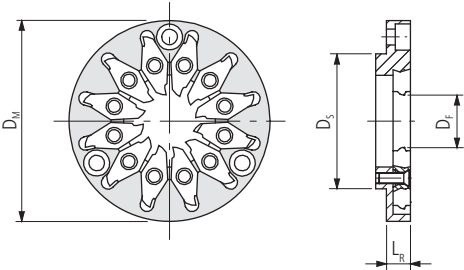
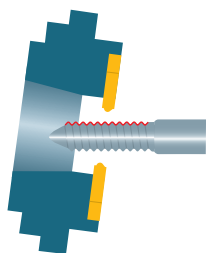
Maschinen-Typ Types de machines Type of machine		Angetriebenes Werkzeug Outil entraîné Driven toolholder		Dimensionen Dimensions Dimensions			Bezeichnung Désignation Designation
				D _A	D _S	L _A	MWA...
CITIZEN	C16 M12/16/20	PCM	LSW-424	35	46	8.9	MWA 354246 089
						13.9	MWA 354246 139
	L20/25/30/32	PCM	KSW-101 LSW-215 LSW-101 MSW-101	40	45	5	MWA 404245 050
			KSW-101 LSW-215 LSW-101 MSW-101	40	45	20	MWA 404245 200
	L25/32	JARVIS (CHS-1B6)	LTR 0128 LTR 0132 LTR 0139 LTR 0168 LTR 0183	40	52	4.3	MWA 402652 043
			LTR 0128 LTR 0132 LTR 0139 LTR 0168 LTR 0183	40	52	5.3	MWA 402652 053
	M1-20, M316	JARVIS (CHS-2B6)	LTR0131 LTR0169 LTR0170	37	46	4.1	MWA 374246 041
MAIER	ML20	WTO	2-020-W15-2000.	40	44	16	MWA 402644 160
						22	MWA 402644 220
	ML20/26	WTO	2-020-W45-3001	40	40	5.5	MWA 402640 055
MONNIER + ZAHNER	M621			85	128	21.5	MWA 8526128 215
NEXTURN	SA20/26/32	PCM	NESA-32	40	45	9.2	MWA 402645 092
						16.2	MWA 402645 162
STAR	SR			40	40	9	MWA 402540 090
	SV SR ECAS			40	40	4	MWA 402540 040
	SV... Rückseite	WTO		40	40	16	MWA 402540 160

Gewindewirbeln (aussen) | Tourbillonnage (extérieur) | Threadwhirling (outside)



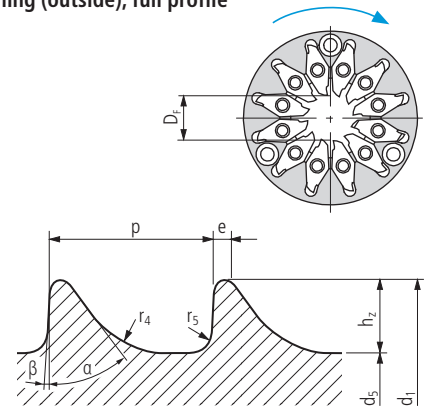
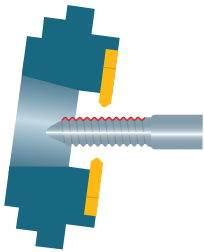
Maschinen-Typ Types de machines Type of machine		Angetriebenes Werkzeug Outil entraîné Driven toolholder		Dimensionen Dimensions Dimensions			Bezeichnung Désignation Designation
				D _A	D _S	L _A	
MWA...							
TORNOS	Deco 10	TORNOS	305217	40	42	3.5	MWA 422042 035
						5.5	MWA 422042 055
	Deco 13	PCM	GW-TDM-D13	40	55	2.3	MWA 402655 023
						7.3	MWA 402655 073
	Deco 13/20	TORNOS	307087 306101	40	57	2.5	MWA 402657 025
						9.5	MWA 402657 095
						12.5	MWA 402657 125
	Deco 13/20 Sigma 20	TORNOS	417627	50	67	4	MWA 502667 040
TRAUB	TNL12	TRAUB	989 520	M34	42	11.4	MWA M342042 114
			987 910	28	42	6.9	MWA 282042 069
	TNL26	TRAUB		54	106	4	MWA 5426106 040
TSUGAMI	BH20/38	TSUGAMI		52	65	14	MWA 522665 140
	BS20/26	TSUGAMI		50	62	12	MWA 504662 120
	BU20/26	TSUGAMI		52	65	8.7	MWA 524665 087
	SS20	TSUGAMI		52	64	8.7	MWA 524664 087
Bearbeitungszentren Centres d'usinage Machining centers		HSK40 A		HSK40 A	46	89	MWA HSK40A 890
		HSK40 E		HSK40 E	46	89	MWA HSK40E 890

Gewindewirbeln (aussen) | Tourbillonnage (extérieur) | Threadwhirling (outside)



Dimensionen Dimensions Dimensions				Schneidenzahl Nbr. de dents No. of teeth	Bezeichnung Désignation Designation
D _F	D _S	D _M	L _R	N	MWR...
6	20	42	8	7	MWR06 164 2042 080 07
				9	MWR06 164 2042 080 09
	26	46	8	9	MWR06 164 2646 080 09
12	25	46	8	9	MWR12 164 2546 090 09
				12	MWR12 164 2546 090 12
	26	46	8	9	MWR12 164 2646 080 09
				12	MWR12 164 2646 080 12
				12	MWR12 164 2644 080 12
	42	46	6	9	MWR12 164 4246 080 09
				12	MWR12 164 4246 080 12
15	26	46	8	9	MWR15 164 2646 080 09
				12	MWR15 164 2646 080 12
		44	8	12	MWR15 164 2644 080 12

Gewindewirbeln (aussen), Vollprofil | Tourbillonnage (extérieur), profil complet | Threadwhirling (outside), full profile

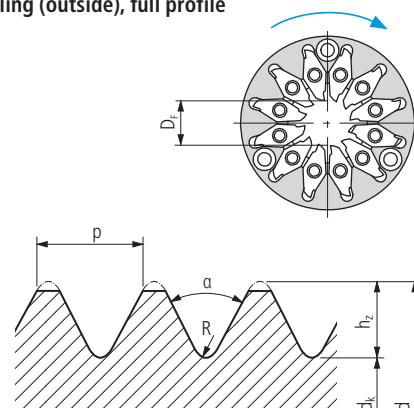
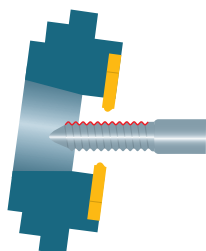


ISO 5835:1991

Bezeichnung Désignation Designation	Hartmetall Carbure Carbide	243	Dimensionen Dimensions Dimensions													
			D _F	d ₁	Tol.	d ₅	Tol.	p	δ	γ	h _z	r ₄	r ₅	e	α	β
																
																
MWI...																
	UHM 30 ...	UHM 30 HX ...														
MWI06 164 HA1.5 VP			6	1.5	0/-0.15	1.1	0/-0.1	0.5	7.3°	6°	0.2	0.3	0.1	0.1	35°	3°
MWI06 164 HA1.5 VP12			6	1.5	0/-0.15	1.1	0/-0.1	0.5	7.3°	12°	0.2	0.3	0.1	0.1	35°	3°
MWI06 164 HA2.0 VP			6	2	0/-0.15	1.3	0/-0.1	0.6	6.9°	6°	0.35	0.4	0.1	0.1	35°	3°
MWI06 164 HA2.0 VP12			6	2	0/-0.15	1.3	0/-0.1	0.6	6.9°	12°	0.35	0.4	0.1	0.1	35°	3°
MWI06 164 HA2.7 VP			6	2.7	0/-0.15	1.9	0/-0.15	1	8.1°	6°	0.4	0.6	0.2	0.1	35°	3°
MWI06 164 HA2.7 VP12			6	2.7	0/-0.15	1.9	0/-0.15	1	8.1°	12°	0.4	0.6	0.2	0.1	35°	3°
MWI12 164 HA1.5 VP			12	1.5	0/-0.15	1.1	0/-0.1	0.5	7.3°	6°	0.2	0.3	0.1	0.1	35°	3°
MWI12 164 HA1.5 VP12			12	1.5	0/-0.15	1.1	0/-0.1	0.5	7.3°	12°	0.2	0.3	0.1	0.1	35°	3°
MWI12 164 HA2.0 VP			12	2	0/-0.15	1.3	0/-0.1	0.6	6.9°	6°	0.35	0.4	0.1	0.1	35°	3°
MWI12 164 HA2.0 VP12			12	2	0/-0.15	1.3	0/-0.1	0.6	6.9°	12°	0.35	0.4	0.1	0.1	35°	3°
MWI12 164 HA2.7 VP			12	2.7	0/-0.15	1.9	0/-0.15	1	8.1°	6°	0.4	0.6	0.2	0.1	35°	3°
MWI12 164 HA2.7 VP12			12	2.7	0/-0.15	1.9	0/-0.15	1	8.1°	12°	0.4	0.6	0.2	0.1	35°	3°
MWI12 164 HA3.5 VP			12	3.5	0/-0.15	2.4	0/-0.15	1.25	7.9°	6°	0.55	0.8	0.2	0.1	35°	3°
MWI12 164 HA3.5 VP12			12	3.5	0/-0.15	2.4	0/-0.15	1.25	7.9°	12°	0.55	0.8	0.2	0.1	35°	3°
MWI12 164 HA4.0 VP			12	4	0/-0.15	2.9	0/-0.15	1.5	8.1°	6°	0.55	0.8	0.2	0.1	35°	3°
MWI12 164 HA4.0 VP12			12	4	0/-0.15	2.9	0/-0.15	1.5	8.1°	12°	0.55	0.8	0.2	0.1	35°	3°
MWI12 164 HA4.5 VP			12	4.5	0/-0.15	3	0/-0.15	1.75	8.6°	6°	0.75	1	0.3	0.1	35°	3°
MWI12 164 HA4.5 VP12			12	4.5	0/-0.15	3	0/-0.15	1.75	8.6°	12°	0.75	1	0.3	0.1	35°	3°
MWI12 164 HA5.0 VP			12	5	0/-0.15	3.5	0/-0.15	1.75	7.6°	6°	0.75	1	0.3	0.1	35°	3°
MWI12 164 HA5.0 VP12			12	5	0/-0.15	3.5	0/-0.15	1.75	7.6°	12°	0.75	1	0.3	0.1	35°	3°
MWI12 164 HB4.0 VP			12	4	0/-0.15	1.9	0/-0.15	1.75	11°	6°	1.05	0.8	0.3	0.1	25°	5°
MWI12 164 HA4.0 VP12			12	4	0/-0.15	1.9	0/-0.15	1.75	11°	12°	1.05	0.8	0.3	0.1	25°	5°
MWI12 164 HB6.5 VP			12	6.5	0/-0.15	3	0/-0.15	2.75	10.6°	6°	1.75	1.2	0.8	0.2	25°	5°
MWI12 164 HB6.5 VP12			12	6.5	0/-0.15	3	0/-0.15	2.75	10.6°	12°	1.75	1.2	0.8	0.2	25°	5°

Herstellerspezifische Gewindep Profile | Exécution des profils spécial | Execution of special thread profil 246

Gewindewirbeln (ausseren), Vollprofil | Tourbillonnage (extérieur), profil complet | Threadwhirling (outside), full profile



ISO 68 / DIN13

Bezeichnung Désignation Designation	Hartmetall Carbure Carbide	□ 243	Dimensionen Dimensions Dimensions													
	●	●	D _F	d	Tol.	d _K	Tol.	p	δ	γ	h _z	R			α	
	○	●														
	○	●														
	●	○														
MWI...																
	UHM 30 ...	UHM 30 HX ...														
MWI06 164 M2 VP	□	□	6	2		1.509		0.4	4.2°	6°	0.245	0.058			60°	
MWI06 164 M3 VP	□	□	6	3		2.387		0.5	3.4°	6°	0.307	0.072			60°	
MWI12 164 M2 VP	□	■	12	2		1.509		0.4	4.2°	6°	0.245	0.058			60°	
MWI12 164 M3 VP	□	■	12	3		2.387		0.5	3.4°	6°	0.307	0.072			60°	
MWI12 164 M4 VP	□	■	12	4		3.141		0.7	3.6°	6°	0.429	0.101			60°	
MWI12 164 M5 VP	□	■	12	5		4.019		0.8	3.3°	6°	0.491	0.115			60°	
MWI12 164 M6 VP	□	■	12	6		4.773		1	3.4°	6°	0.613	0.144			60°	
MWI12 164 M8 VP	□	■	12	8		6.466		1.3	3.2°	6°	0.767	0.18			60°	
MWI12 164 M10 VP	□	□	12	10		8.16		1.5	3°	6°	0.92	0.217			60°	

ISO 68/DIN13 – Feingewinde | Filet fin | Fine thread

Bezeichnung Désignation Designation	Hartmetall Carbure Carbide		Dimensionen Dimensions Dimensions												
			D _F	d	Tol.	d _K	Tol.	p	δ	γ	h _z	R			α
															
															
															
MWI...															
	UHM 30 ...	UHM 30 HX ...													
MWI06 164 M2x0.25 VP			6	2		1.693		0.25	2.5°	6°	0.153	0.036			60°
MWI06 164 M3x0.35 VP			6	3		2.571		0.35	2.3°	6°	0.215	0.051			60°
MWI12 164 M2x0.25 VP			12	2		1.693		0.25	2.5°	6°	0.153	0.036			60°
MWI12 164 M3x0.35 VP			12	3		2.571		0.35	2.3°	6°	0.215	0.051			60°
MWI12 164 M4x0.5 VP			12	4		3.387		0.35	2.5°	6°	0.307	0.072			60°
MWI12 164 M5x0.5 VP			12	5		4.387		0.5	1.9°	6°	0.307	0.072			60°
MWI12 164 M6x0.75 VP			12	6		5.08		0.75	2.5°	6°	0.46	0.108			60°
MWI12 164 M8x0.75 VP			12	8		7.08		0.75	1.8°	6°	0.46	0.108			60°
MWI12 164 M8x1.0 VP			12	8		6.773		1	2.5°	6°	0.613	0.144			60°
MWI12 164 M10x0.75 VP			12	10		9.08		0.75	1.4°	6°	0.46	0.108			60°
MWI12 164 M10x1.0 VP			12	10		8.773		1	1.9°	6°	0.613	0.144			60°
MWI12 164 M10x1.25 VP			12	10		8.466		1.25	2.5°	6°	0.767	0.18			60°

Herstellerspezifische Gewindep Profile | Exécution des profils spécial | Execution of special thread profil 246

Abbildung Illustration Illustration	Bezeichnung Désignation Designation	Dimensionen Dimensions Dimensions	Beschreibung Description Description	Halter Porte-outil Holder
	MSP 25070	M2.5 × 7 T08	Torxschraube Vis torx Torx scew	1601-4-4 N
	MSP 30160 TP08	M3 × 16 TP8	Torxschraube Vis torx Torx scew TORX PLUS®	
	MSP TX08	T08	Torxschlüssel Tournevis torx Torx screwdriver	
	MSP TX08 D	T08 (1.2 Nm)	Drehmoment-Torxschlüssel Tournevis à serrage contrôlé Torquedriver	
	MSP 30080 IB2.5	M3 × 8	Senkschraube Vis à tête noyée Counter sunk screw	
	MSP 30120 IB2.5	M3 × 12		
	MSP 40060 IB2.5	M4 × 6		
	MSP 40120 IB2.5	M4 × 12		
	MSP 40140 IB2.5	M4 × 14		
	MSP 30040 IB2.5	M3 × 4	Zylinderschraube Vis cylindrique Cylinder headscrew	
	MSP 30060 IB2.5	M3 × 6		
	MSP 30080 IB2.5	M3 × 8		
	MSP 30100 IB2.5	M3 × 10		
	MSP 30120 IB2.5	M3 × 12		
	MSP 30160 IB2.5	M3 × 16		
	MSP 40080 IB3	M4 × 8		
	MSP 40100 IB3	M4 × 10		
	MSP 40120 IB3	M4 × 12		
	MSP 40140 IB3	M4 × 14		
	MSP 40160 IB3	M4 × 16	Innensechskantschlüssel Clé allen Allen-type wrench	
	MSP IB1.5			
	MSP IB10			
	MSP IB2			
	MSP IB2.5			
	MSP IB3			
	MSP IB4			
	MSP IB5			
	MSP IB6			
	MSP IB8			

Sorte Nuance Grade	Normbezeichnung Norme Norm	Zähigkeit des Schneidstoffs Tenacité du matériau de coupe Toughness of cutting grades												Werkstoffe (Kategorie) Matières (Catégorie) Materials (Category)							
		Härte (HB) Dureté (HB) Hardness value (HB) 												125 – 300	180 – 250	200 – 350		180 – 220	220 – 330	60 – 130	
		01	05	10	15	20	25	30	35	40	45	50	Stahl unlegiert Acier non allié Steel non-alloyed (I)	Stahl niedrig legiert Acier faibl. allié Steel low alloyed (II)	Stahl hochlegiert Acier fortem. allié Steel high alloyed (III)	Titan Titane Titanium (IV)	Rostfreier Stahl Acier inoxydable Stainless steel (V)	Rostfreier Stahl Acier inoxydable Stainless steel (VI)	Aluminium Aluminium Aluminium (VII)	Messing Laiton Brass (VIII)	
Hartmetall Carbure Carbide																					
UHM 30	K 30/M 20												●	○	○	○	○	○	●	●	
UHM 30 HX	K 30/M 20												●	●	●	●	●	●	○	○	

Werkstoffe | Matières | Materials

	Stahl unlegiert Acier non allié Steel unalloyed			Stahl niedriglegiert Acier faibl. allié Steel low alloyed			Stahl hochlegiert Acier fortem. allié Steel high alloyed			Titan Titane Titanium		
Härte (HB) Dureté (HB) Hardness value (HB)	125–300			180–250			200–350			–		
Kategorie Catégorie Category	I			II			III			IV		
Bearbeitung Usinage Machining method	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼

Vorschub pro Zahn (f_z) | Avance par dent (f_z) | Feed per tooth (f_z)

	f (mm)			f (mm)			f (mm)			f (mm)		
	–	0.02–0.15	0.005–0.08	–	0.02–0.15	0.005–0.08	–	0.02–0.15	0.005–0.08	–	0.02–0.08	0.005–0.06

Schnitttiefen (a_p) | Profondeurs de passes (a_p) | Depths of cut (a_p)

	a _p (mm)			a _p (mm)			a _p (mm)			a _p (mm)		
	–	< 4	< 4	–	< 4	< 4	–	< 4	< 4	–	< 4	< 4

Schnittgeschwindigkeiten (v_c) | Vitesses de coupe (v_c) | Cutting speeds (v_c)

	v _c (m/min)			v _c (m/min)			v _c (m/min)			v _c (m/min)		
Schneidstoff Hartmetall Matériaux de coupe carbure Cutting material carbide												
UHM 30	–	50–80	50–100	–	40–80	40–90	–	30–70	30–80	–	50–80	80–120
UHM 30 HX	–	80–180	120–220	–	50–140	100–180	–	50–120	80–160	–	80–120	100–150

Werkstoffe | Matières | Materials

	Rostfreier Stahl Acier inoxydable Stainless steel			Rostfreier Stahl Acier inoxydable Stainless steel			Aluminium Aluminium Aluminium			Messing Laiton Brass		
Härte (HB) Dureté (HB) Hardness value (HB)	180–220			220–330			60–130			–		
Kategorie Catégorie Category	V			VI			VII			VIII		
Bearbeitung Usinage Machining method	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼

Vorschub pro Zahn (f_z) | Avance par dent (f_z) | Feed per tooth (f_z)

	f (mm/U mm/tr mm/rev)			f (mm/U mm/tr mm/rev)			f (mm/U mm/tr mm/rev)			f (mm/U mm/tr mm/rev)		
	–	0.01–0.25	0.005–0.1	–	0.01–0.12	0.005–0.1	–	0.02–0.25	0.005–0.2	–	0.02–0.15	0.005–0.1

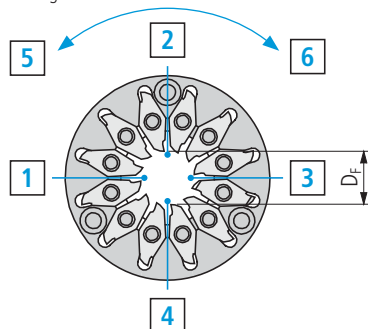
Schnitttiefen (a_p) | Profondeurs de passes (a_p) | Depths of cut (a_p)

	ap (mm)			ap (mm)			ap (mm)			ap (mm)		
	–	<4	<4	–	<4	<4	–	<4	<4	–	<4	<4

Schnittgeschwindigkeiten (v_c) | Vitesses de coupe (v_c) | Cutting speeds (v_c)

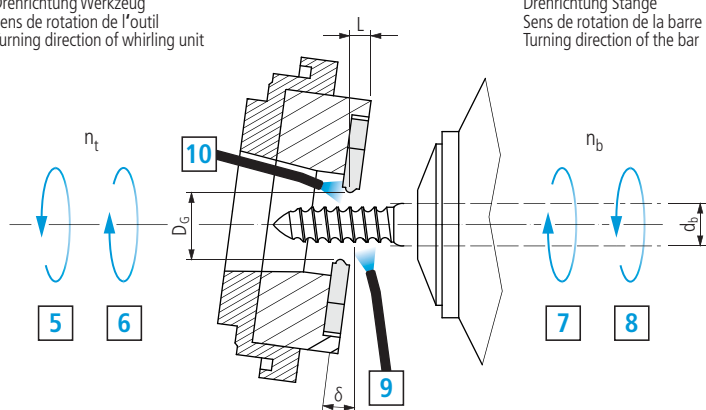
	v _c (m/min)			v _c (m/min)			v _c (m/min)			v _c (m/min)		
Schneidstoff Hartmetall Matériaux de coupe carbure Cutting material carbide	v _c (m/min)			v _c (m/min)			v _c (m/min)			v _c (m/min)		
UHM 30	–	50–100	50–150	–	30–70	40–80	–	50–200	100–500	–	50–140	50–160
UHM 30 HX	–	80–150	100–250	–	50–100	70–120	–	–	–	–	–	–

Schnittposition
 Position d'usinage
 Cutting location



Drehrichtung Werkzeug
 Sens de rotation de l'outil
 Turning direction of whirling unit

Y-Achse
 Y-axis
 Y-axis



Drehrichtung Stange
 Sens de rotation de la barre
 Turning direction of the bar

MWI...

Maschinendaten Données de la machine Machine specifications				
Maschinenhersteller Marque de la machine Machine manufacturer				
Maschinentyp Type de la machine Type of machine				
Hersteller angetriebenes Werkzeug Marque de l'appareil à tourbillonner Manufacturer of driven tool				
Typ angetriebenes Werkzeug Type de l'appareil à tourbillonner Type of driven tool				
Flugkreis Schneide D _F Diamètre inscrit des couteaux D _F Flight circle D _F	[mm]			
Montageort (Revolver, Linear-Schlitten, anderer) Situation sur montage (torelle, peigne, autres) Mounting place (turret, gang rack, elsewhere)				
Y-Achse vorhanden? Axe Y disponible? Y-axis available?	☐	☐	☐	☐
	Ja Oui Yes	Nein Non No		
Hochdruckkühlung vorhanden? Lubrification haute pression disponible? High pressure cooling?	[bar]			
	≤20	>20	Nein Non No	
Kühlmittelzufuhr Position de la lubrification Cooling direction				
	9	10		
Drehrichtung Werkzeug Sens de rotation de l'outil à tourbillonner? Turning direction of whirling unit	[n _t]			
	5	6		

Werkstoff Matière Material				
Bezeichnung Désignation Designation	(DIN)			
Stangendurchmesser Diamètre de la barre Bar diameter	[d _b]			
Drehrichtung Stange Sens de rotation de la barre Turning direction of the bar	[n _b]			
		7	8	
Schnittposition Position d'usinage Cutting location				
		1	2	3

Schneide Plaquette Insert			
Gewindezeichnung Dessin du filet Thread drawing	(Nr. No. No.)		
Vollprofil Profil complet Full profile			
	Ja Oui Yes	Nein Non No	
Anzahl Gewindegänge Nombre de filets Number of thread starts			
	1	2	
Beschichtung Revêtement Coating			
	Ja Oui Yes	Nein Non No	

Firma | Entreprise | Company

Strasse | Rue | Road

PLZ, Ort | Code postal, Lieu | Postal code, City

Zuständiger Mitarbeiter | Personne responsable | Responsible person

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E-Mail | E-Mail | E-Mail

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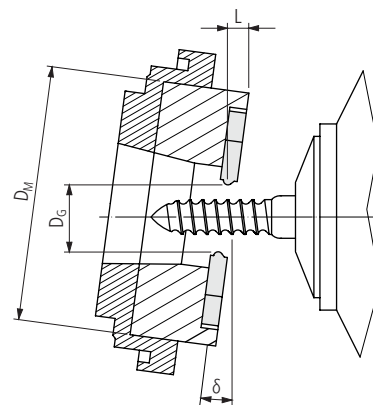
Kreuzlingerstrasse 22, CH-8555 Müllheim

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Längenänderung | Modification de la longueur | Change in length

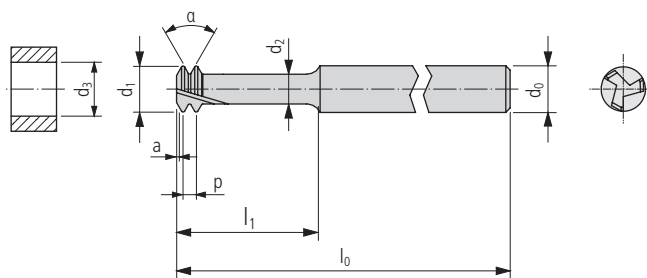
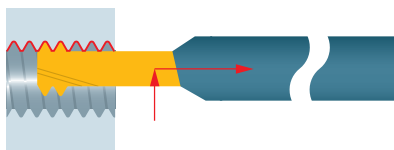
Winkel Angle Angle	Abstand (Ring-Aussendurchmesser) Distance (Ring diamètre extérieur) Distance (Ring diameter outside)	
δ	L ($D_M = 42$)	L ($D_M = 46$)
0°	2	2
1°	2.7	2.8
2°	3.5	3.6
3°	4.2	4.4
4°	4.9	5.2
5°	5.7	6
6°	6.4	6.8
7°	7.1	7.6
8°	7.8	8.4
9°	8.6	9.2
10°	9.3	10
11°	10	10.8
12°	10.7	11.6
13°	11.4	12.3
14°	12.2	13.1
15°	12.9	13.9
16°	13.6	14.7
17°	14.3	15.4
18°	15	16.2
19°	15.7	17
20°	16.4	17.7
21°	17.1	18.5
22°	17.7	19.2
23°	18.4	20
24°	19.1	20.7
25°	19.7	21.4



Max. Gewindedurchmesser | Diamètre de filetage maximum | Max. thread diameter

Winkel Angle Angle	Durchlass Distance Distance			
δ	D_G	D_G	D_G	D_G
0° ($D_F = D_G$)	6	12	15	25
1°	6	12	15	25
2°	6	11.99	14.99	24.98
3°	5.99	11.98	14.98	24.97
4°	5.99	11.97	14.96	24.94
5°	5.98	11.95	14.94	24.9
6°	5.97	11.93	14.92	24.86
7°	5.96	11.91	14.89	24.81
8°	5.94	11.88	14.85	24.76
9°	5.93	11.85	14.82	24.69
10°	5.91	11.82	14.77	24.62
11°	5.89	11.78	14.72	24.54
12°	5.87	11.74	14.67	24.45
13°	5.85	11.69	14.62	24.36
14°	5.82	11.64	14.55	24.26
15°	5.8	11.59	14.49	24.15
16°	5.77	11.54	14.42	24.03
17°	5.74	11.48	14.34	23.91
18°	5.71	11.41	14.27	23.78
19°	5.67	11.35	14.18	23.64
20°	5.64	11.28	14.1	23.49
21°	5.6	11.2	14	23.34
22°	5.56	11.13	13.91	23.18
23°	5.52	11.05	13.81	23.01
24°	5.48	10.96	13.7	22.84
25°	5.44	10.88	13.59	22.66

Vollprofil – 3 Zähne, 2 Zahnreihen | Profil complet – 3 dents, 2 filets | Full profile – 3 flutes, 2 teeth



Bezeichnung Désignation Designation	Hartmetall Carbure Carbide □ 254		Dimensionen Dimensions Dimensions										
	●	●	d ₀	d ₁	d ₂	a	l ₀	l ₁	Bereich Gamme Range	p	d ₃	Tol.	α
WHS...	○	○											
	●	○											
	○	○											
	●	○											
	...	UHM 20											
	...	UHM 20 HX											
WHS 338 010 025	■	■	3	0.64	0.24	0.03	38	2.3	M1	0.25	0.69	0/+0.03	60°
WHS 338 012 025	■	■	3	0.84	0.44	0.03	38	2.8	M1.2	0.25	0.89	0/+0.03	60°
WHS 338 014 030	■	■	3	0.98	0.53	0.03	38	3.2	M1.4	0.3	1.03	0/+0.04	60°
WHS 338 016 035	■	■	3	1.12	0.61	0.03	38	3.7	M1.6	0.35	1.17	0/+0.04	60°
WHS 338 018 035	■	■	3	1.32	0.81	0.03	38	4.1	M1.8	0.35	1.37	0/+0.04	60°
WHS 338 020 040	■	■	3	1.46	0.9	0.03	38	4.6	M2	0.4	1.51	0/+0.05	60°
WHS 338 022 045	■	■	3	1.6	0.98	0.03	38	5.1	M2.2	0.45	1.65	0/+0.05	60°
WHS 338 023 040	■	■	3	1.76	1.2	0.03	38	5.2	M2.3	0.4	1.81	0/+0.05	60°
WHS 338 025 045	■	■	3	1.9	1.28	0.03	38	5.8	M2.5	0.45	1.95	0/+0.05	60°
WHS 338 030 050	■	■	3	2.34	1.67	0.03	38	6.9	M3	0.5	2.39	0/+0.05	60°
WHS 338 035 060	■	■	3	2.71	1.93	0.03	38	8.1	M3.5	0.6	2.76	0/+0.06	60°
WHS 442 040 070	■	■	4	3.09	2.2	0.03	42	9.2	M4	0.7	3.14	0/+0.06	60°
WHS 442 045 075	■	■	4	3.53	2.56	0.03	42	10.4	M4.5	0.75	3.58	0/+0.07	60°
WHS 442 050 080	■	■	4	3.97	2.95	0.03	42	11.5	M5	0.8	4.02	0/+0.07	60°

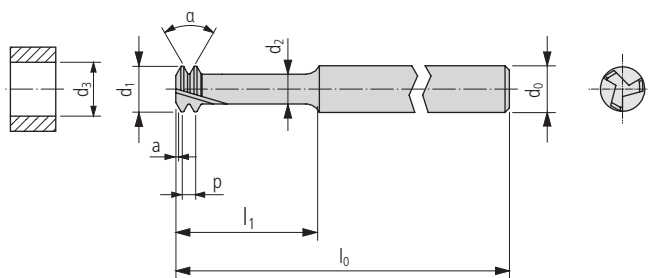
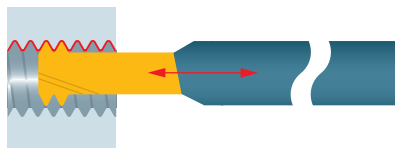
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Bezeichnung Désignation Designation	Hartmetall Carbure Carbide □ 254		Dimensionen Dimensions Dimensions										
	●	●	d ₀	d ₁	d ₂	a	l ₀	l ₁	Bereich Gamme Range	p	d ₃	Tol.	α
WHL...	○	○											
	●	○											
	○	○											
	●	○											
	...	UHM 20											
	...	UHM 20 HX											
WHL 338 010 025	■	■	3	0.64	0.24	0.03	38	4.6	M1	0.25	0.69	0/+0.03	60°
WHL 338 012 025	■	■	3	0.84	0.44	0.03	38	5.5	M1.2	0.25	0.89	0/+0.03	60°
WHL 338 014 030	■	■	3	0.98	0.53	0.03	38	6.4	M1.4	0.3	1.03	0/+0.04	60°
WHL 338 016 035	■	■	3	1.12	0.61	0.03	38	7.4	M1.6	0.35	1.17	0/+0.04	60°
WHL 338 018 035	■	■	3	1.32	0.81	0.03	38	8.3	M1.8	0.35	1.37	0/+0.04	60°
WHL 338 020 040	■	■	3	1.46	0.9	0.03	38	9.2	M2	0.4	1.51	0/+0.05	60°
WHL 338 022 045	■	■	3	1.6	0.98	0.03	38	10.1	M2.2	0.45	1.65	0/+0.05	60°
WHL 338 023 040	■	■	3	1.76	1.2	0.03	38	10.4	M2.3	0.4	1.81	0/+0.05	60°
WHL 338 025 045	■	■	3	1.9	1.28	0.03	38	11.5	M2.5	0.45	1.95	0/+0.05	60°
WHL 338 030 050	■	■	3	2.34	1.67	0.03	38	13.8	M3	0.5	2.39	0/+0.05	60°
WHL 338 035 060	■	■	3	2.71	1.93	0.03	38	16.1	M3.5	0.6	2.76	0/+0.06	60°
WHL 442 040 070	■	■	4	3.09	2.2	0.03	42	18.4	M4	0.7	3.14	0/+0.06	60°
WHL 442 045 075	■	■	4	3.53	2.56	0.03	42	20.7	M4.5	0.75	3.58	0/+0.07	60°
WHL 442 050 080	■	■	4	3.97	2.95	0.03	42	23	M5	0.8	4.02	0/+0.07	60°

Vollprofil – 3 Zähne, 2 Zahnreihen | Profil complet – 3 dents, 2 filets | Full profile – 3 flutes, 2 teeth

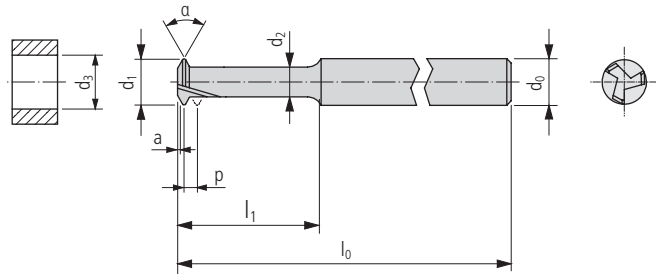
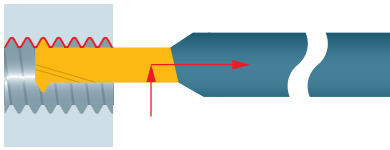
Verstärkte Ausführung | Version renforcée | Strengthened type



Bezeichnung Désignation Designation	Hartmetall Carbure Carbide 		Dimensionen Dimensions Dimensions										
			d ₀	d ₁	d ₂	a	l ₀	l ₁	Bereich Gamme Range	p	d ₃	Tol.	α
WHA...													
													
													
	UHM 20	UHM 20 HX											
WHA 338 010 025			3	0.83	0.41	0.03	38	2.30	M1.0	0.25	0.69	0/+0.03	60°
WHA 338 012 025			3	1.03	0.61	0.03	38	2.80	M1.2	0.25	0.89	0/+0.03	60°
WHA 338 014 030			3	1.21	0.74	0.03	38	3.20	M1.4	0.3	1.03	0/+0.04	60°
WHA 338 016 035			3	1.39	0.88	0.03	38	3.70	M1.6	0.35	1.17	0/+0.04	60°
WHA 338 018 035			3	1.59	1.08	0.03	38	4.10	M1.8	0.35	1.37	0/+0.04	60°
WHA 338 020 040			3	1.76	1.19	0.03	38	4.60	M2.0	0.4	1.51	0/+0.05	60°
WHA 338 022 045			3	1.94	1.31	0.03	38	5.10	M2.2	0.45	1.65	0/+0.05	60°
WHA 338 023 040			3	2.06	1.49	0.03	38	5.20	M2.3	0.4	1.81	0/+0.05	60°
WHA 338 025 045			3	2.24	1.61	0.03	38	5.80	M2.5	0.45	1.95	0/+0.05	60°
WHA 338 030 050			3	2.72	2.04	0.03	38	6.90	M3.0	0.5	2.39	0/+0.05	60°
WHA 442 035 060			4	3.16	2.37	0.03	42	8.10	M3.5	0.6	2.76	0/+0.06	60°
WHA 442 040 070			4	3.62	2.71	0.03	42	9.20	M4.0	0.7	3.14	0/+0.06	60°

Bezeichnung Désignation Designation	Hartmetall Carbure Carbide 		Dimensionen Dimensions Dimensions										
			d ₀	d ₁	d ₂	a	l ₀	l ₁	Bereich Gamme Range	p	d ₃	Tol.	α
WHB...													
													
													
	UHM 20	UHM 20 HX											
WHB 338 010 025			3	0.83	0.41	0.03	38	4.60	M1.0	0.25	0.69	0/+0.03	60°
WHB 338 012 025			3	1.03	0.61	0.03	38	5.60	M1.2	0.25	0.89	0/+0.03	60°
WHB 338 014 030			3	1.21	0.74	0.03	38	6.40	M1.4	0.3	1.03	0/+0.04	60°
WHB 338 016 035			3	1.39	0.88	0.03	38	7.40	M1.6	0.35	1.17	0/+0.04	60°
WHB 338 018 035			3	1.59	1.08	0.03	38	8.20	M1.8	0.35	1.37	0/+0.04	60°
WHB 338 020 040			3	1.76	1.19	0.03	38	9.20	M2.0	0.4	1.51	0/+0.05	60°
WHB 338 022 045			3	1.94	1.31	0.03	38	10.20	M2.2	0.45	1.65	0/+0.05	60°
WHB 338 023 040			3	2.06	1.49	0.03	38	10.40	M2.3	0.4	1.81	0/+0.05	60°
WHB 338 025 045			3	2.24	1.61	0.03	38	11.60	M2.5	0.45	1.95	0/+0.05	60°
WHB 338 030 050			3	2.72	2.04	0.03	38	13.80	M3.0	0.5	2.39	0/+0.05	60°
WHB 442 035 060			4	3.16	2.37	0.03	42	16.20	M3.5	0.6	2.76	0/+0.06	60°
WHB 442 040 070			4	3.62	2.71	0.03	42	18.40	M4.0	0.7	3.14	0/+0.06	60°

Vollprofil – 3 Zähne, 1 Zahnreihe | Profil complet – 3 dents, 1 filet | Full profile – 3 flutes, 1 tooth



Bezeichnung Désignation Designation	Hartmetall Carbure Carbide		Dimensionen Dimensions Dimensions										
	●	○	d0	d1	d2	a	l0	l1	Bereich Gamme Range	p	d3	Tol.	α
WHC...	●	○											
	... UHM 20	... UHM 20 HX											
WHC 338 010 025	■	■	3	0.68	0.30	0.03	38	2.50	M1.0	0.25	0.69	0/+0.03	60°
WHC 338 012 025	■	■	3	0.88	0.50	0.03	38	2.70	M1.2	0.25	0.89	0/+0.03	60°
WHC 338 014 025	□	□	3	1.08	0.70	0.03	38	2.90	M1.4	0.25	0.89	0/+0.03	60°
WHC 338 016 025	□	□	3	1.28	0.90	0.03	38	3.10	M1.6	0.25	0.89	0/+0.03	60°
WHC 338 018 025	□	□	3	1.48	1.10	0.03	38	3.30	M1.8	0.25	0.89	0/+0.03	60°
WHC 338 020 025	□	□	3	1.68	1.30	0.03	38	3.50	M2.0	0.25	0.89	0/+0.03	60°
WHC 338 014 030	■	■	3	1.02	0.58	0.03	38	3.20	M1.4	0.3	1.03	0/+0.04	60°
WHC 338 016 030	□	□	3	1.22	0.78	0.03	38	3.40	M1.6	0.3	1.03	0/+0.04	60°
WHC 338 018 030	□	□	3	1.42	0.98	0.03	38	3.60	M1.8	0.3	1.03	0/+0.04	60°
WHC 338 020 030	□	□	3	1.62	1.18	0.03	38	3.80	M2.0	0.3	1.03	0/+0.04	60°
WHC 338 022 030	□	□	3	1.82	1.38	0.03	38	4.00	M2.2	0.3	1.03	0/+0.04	60°
WHC 338 016 035	■	■	3	1.16	0.65	0.03	38	3.70	M1.6	0.35	1.17	0/+0.04	60°
WHC 338 018 035	■	■	3	1.36	0.85	0.03	38	3.90	M1.8	0.35	1.37	0/+0.04	60°
WHC 338 020 035	□	□	3	1.56	1.05	0.03	38	4.10	M2.0	0.35	1.37	0/+0.04	60°
WHC 338 022 035	□	□	3	1.76	1.25	0.03	38	4.30	M2.2	0.35	1.37	0/+0.04	60°
WHC 338 025 035	□	□	3	2.06	1.55	0.03	38	4.60	M2.5	0.35	1.37	0/+0.04	60°
WHC 338 030 035	□	□	3	2.56	2.05	0.03	38	5.10	M3.0	0.35	1.37	0/+0.04	60°
WHC 338 035 035	□	□	3	3.06	2.55	0.03	38	5.60	M3.5	0.35	1.37	0/+0.04	60°
WHC 338 020 040	■	■	3	1.50	0.93	0.03	38	4.40	M2.0	0.4	1.51	0/+0.05	60°
WHC 338 022 040	□	□	3	1.70	1.13	0.03	38	4.60	M2.2	0.4	1.51	0/+0.05	60°
WHC 338 025 040	□	□	3	2.00	1.43	0.03	38	4.90	M2.5	0.4	1.51	0/+0.05	60°
WHC 338 030 040	□	□	3	2.50	1.93	0.03	38	5.40	M3	0.4	1.51	0/+0.05	60°
WHC 338 035 040	□	□	3	2.98	2.41	0.03	38	5.90	M3.5	0.4	1.51	0/+0.05	60°
WHC 338 022 045	■	■	3	1.64	1.01	0.03	38	4.90	M2.2	0.45	1.65	0/+0.05	60°
WHC 338 025 045	■	■	3	1.94	1.31	0.03	38	5.20	M2.5	0.45	1.95	0/+0.05	60°
WHC 338 030 045	□	□	3	2.44	1.81	0.03	38	5.70	M3	0.45	1.95	0/+0.05	60°
WHC 338 035 045	□	□	3	2.94	2.31	0.03	38	6.20	M3.5	0.45	1.95	0/+0.05	60°
WHC 442 040 045	□	□	3	3.44	2.81	0.03	38	6.70	M4	0.45	1.95	0/+0.05	60°
WHC 338 030 050	■	■	3	2.38	1.69	0.03	38	6.00	M3	0.5	2.39	0/+0.05	60°
WHC 338 035 050	□	□	3	2.88	2.19	0.03	38	6.50	M3.5	0.5	2.39	0/+0.05	60°
WHC 442 040 050	□	□	4	3.38	2.69	0.03	42	7.00	M4	0.5	2.39	0/+0.05	60°
WHC 442 045 050	□	□	4	3.88	3.19	0.03	42	7.50	M4.5	0.5	2.39	0/+0.05	60°
WHC 442 035 060	■	■	4	2.75	1.95	0.03	42	7.10	M3.5	0.6	2.76	0/+0.06	60°
WHC 442 040 060	□	□	4	3.25	2.45	0.03	42	7.60	M4	0.6	2.76	0/+0.06	60°
WHC 442 045 060	□	□	4	3.75	2.95	0.03	42	8.10	M4.5	0.6	2.76	0/+0.06	60°
WHC 442 040 070	■	■	4	3.13	2.21	0.03	42	8.20	M4	0.7	3.14	0/+0.06	60°
WHC 442 045 070	□	□	4	3.63	2.71	0.03	42	8.70	M4.5	0.7	3.14	0/+0.06	60°
WHC 442 045 075	■	■	4	3.57	2.59	0.03	42	9.00	M4.5	0.75	3.58	0/+0.07	60°
WHC 442 050 075	□	□	4	3.98	3.00	0.03	42	9.50	M5	0.75	3.58	0/+0.07	60°
WHC 442 050 080	■	■	4	3.98	2.94	0.03	42	9.80	M5	0.8	4.02	0/+0.07	60°

Vorschub pro Zahn (f_z) | Avance par dent (f_z) | Feed per tooth (f_z)

Bezeichnung Désignation Designation		Stahl unlegiert Acier non allié Steel unalloyed	Stahl niedriglegiert Acier faibl. allié Steel low alloyed	Stahl hochlegiert Acier fortem. allié Steel high alloyed	Titan Titane Titanium	Rostfreier Stahl Acier inoxydable Stainless steel	Aluminium Aluminium Aluminium	Messing Laiton Brass	Kunststoff Synthétique Synthetics
	p	f _z (mm)	f _z (mm)	f _z (mm)	f _z (mm)	f _z (mm)	f _z (mm)	f _z (mm)	f _z (mm)
WHS...	0.25	0.004–0.008	0.004–0.008	0.003–0.006	0.003–0.006	0.003–0.006	0.004–0.011	0.004–0.008	0.004–0.011
	0.3	0.004–0.010	0.004–0.010	0.003–0.007	0.003–0.007	0.003–0.007	0.005–0.013	0.004–0.010	0.005–0.013
	0.35	0.004–0.011	0.004–0.011	0.004–0.008	0.004–0.008	0.004–0.008	0.006–0.015	0.004–0.011	0.006–0.015
	0.4	0.005–0.013	0.005–0.013	0.004–0.010	0.004–0.010	0.004–0.010	0.007–0.021	0.005–0.013	0.007–0.021
	0.45	0.006–0.015	0.006–0.015	0.004–0.011	0.004–0.011	0.004–0.011	0.008–0.026	0.006–0.015	0.008–0.026
	0.5	0.007–0.021	0.007–0.021	0.005–0.013	0.005–0.013	0.005–0.013	0.010–0.030	0.007–0.021	0.010–0.030
	0.6	0.008–0.026	0.008–0.026	0.006–0.015	0.006–0.015	0.006–0.015	0.012–0.033	0.008–0.026	0.012–0.033
	0.7	0.010–0.030	0.010–0.030	0.007–0.021	0.007–0.021	0.007–0.021	0.015–0.035	0.010–0.030	0.015–0.035
	0.75	0.012–0.033	0.012–0.033	0.010–0.026	0.010–0.026	0.010–0.026	0.018–0.040	0.012–0.033	0.018–0.040
	0.8	0.015–0.035	0.015–0.035	0.012–0.030	0.012–0.030	0.012–0.030	0.020–0.045	0.015–0.035	0.020–0.045
WHL...	0.25	0.003–0.006	0.003–0.006	0.002–0.004	0.002–0.004	0.002–0.004	0.004–0.008	0.003–0.006	0.004–0.008
	0.3	0.003–0.007	0.003–0.007	0.002–0.005	0.002–0.005	0.002–0.005	0.004–0.010	0.003–0.007	0.004–0.010
	0.35	0.004–0.008	0.004–0.008	0.003–0.006	0.003–0.006	0.003–0.006	0.004–0.011	0.004–0.008	0.004–0.011
	0.4	0.004–0.010	0.004–0.010	0.003–0.007	0.003–0.007	0.003–0.007	0.005–0.013	0.004–0.010	0.005–0.013
	0.45	0.004–0.011	0.004–0.011	0.004–0.008	0.004–0.008	0.004–0.008	0.006–0.015	0.004–0.011	0.006–0.015
	0.5	0.005–0.013	0.005–0.013	0.004–0.010	0.004–0.010	0.004–0.010	0.007–0.021	0.005–0.013	0.007–0.021
	0.6	0.006–0.015	0.006–0.015	0.004–0.011	0.004–0.011	0.004–0.011	0.008–0.026	0.006–0.015	0.008–0.026
	0.7	0.007–0.021	0.007–0.021	0.005–0.013	0.005–0.013	0.005–0.013	0.010–0.030	0.007–0.021	0.010–0.030
	0.75	0.008–0.026	0.008–0.026	0.006–0.015	0.006–0.015	0.006–0.015	0.012–0.033	0.008–0.026	0.012–0.033
	0.8	0.010–0.030	0.010–0.030	0.007–0.021	0.007–0.021	0.007–0.021	0.015–0.035	0.010–0.030	0.015–0.035
WHA...	0.25	0.004–0.011	0.004–0.011	0.004–0.008	0.004–0.008	0.004–0.008	0.006–0.015	0.004–0.011	0.006–0.015
	0.3	0.005–0.013	0.005–0.013	0.004–0.010	0.004–0.010	0.004–0.010	0.007–0.021	0.005–0.013	0.007–0.021
	0.35	0.006–0.015	0.006–0.015	0.004–0.011	0.004–0.011	0.004–0.011	0.008–0.026	0.006–0.015	0.008–0.026
	0.4	0.007–0.021	0.007–0.021	0.005–0.013	0.005–0.013	0.005–0.013	0.010–0.030	0.007–0.021	0.010–0.030
	0.45	0.008–0.026	0.008–0.026	0.006–0.015	0.006–0.015	0.006–0.015	0.012–0.033	0.008–0.026	0.012–0.033
	0.5	0.010–0.030	0.010–0.030	0.007–0.021	0.007–0.021	0.007–0.021	0.015–0.035	0.010–0.030	0.015–0.035
	0.6	0.012–0.033	0.012–0.033	0.008–0.026	0.008–0.026	0.008–0.026	0.018–0.040	0.012–0.033	0.018–0.040
	0.7	0.015–0.035	0.015–0.035	0.010–0.030	0.010–0.030	0.010–0.030	0.020–0.045	0.015–0.035	0.020–0.045
	0.75	0.018–0.040	0.018–0.040	0.012–0.033	0.012–0.033	0.012–0.033	0.025–0.050	0.018–0.040	0.025–0.050
	0.8	0.020–0.045	0.020–0.045	0.015–0.035	0.015–0.035	0.015–0.035	0.030–0.060	0.020–0.045	0.030–0.060
WHB...	0.25	0.004–0.008	0.004–0.008	0.003–0.006	0.003–0.006	0.003–0.006	0.004–0.011	0.004–0.008	0.004–0.011
	0.3	0.004–0.010	0.004–0.010	0.003–0.007	0.003–0.007	0.003–0.007	0.005–0.013	0.004–0.010	0.005–0.013
	0.35	0.004–0.011	0.004–0.011	0.004–0.008	0.004–0.008	0.004–0.008	0.006–0.015	0.004–0.011	0.006–0.015
	0.4	0.005–0.013	0.005–0.013	0.004–0.010	0.004–0.010	0.004–0.010	0.007–0.021	0.005–0.013	0.007–0.021
	0.45	0.006–0.015	0.006–0.015	0.004–0.011	0.004–0.011	0.004–0.011	0.008–0.026	0.006–0.015	0.008–0.026
	0.5	0.007–0.021	0.007–0.021	0.005–0.013	0.005–0.013	0.005–0.013	0.010–0.030	0.007–0.021	0.010–0.030
	0.6	0.008–0.026	0.008–0.026	0.006–0.015	0.006–0.015	0.006–0.015	0.012–0.033	0.008–0.026	0.012–0.033
	0.7	0.010–0.030	0.010–0.030	0.007–0.021	0.007–0.021	0.007–0.021	0.015–0.035	0.010–0.030	0.015–0.035
	0.75	0.012–0.033	0.012–0.033	0.008–0.026	0.008–0.026	0.008–0.026	0.018–0.040	0.012–0.033	0.018–0.040
	0.8	0.015–0.035	0.015–0.035	0.010–0.030	0.010–0.030	0.010–0.030	0.020–0.045	0.015–0.035	0.020–0.045
WHC...	0.25	0.003–0.006	0.003–0.006	0.002–0.004	0.002–0.004	0.002–0.004	0.004–0.008	0.003–0.006	0.004–0.008
	0.3	0.003–0.007	0.003–0.007	0.002–0.005	0.002–0.005	0.002–0.005	0.004–0.010	0.003–0.007	0.004–0.010
	0.35	0.004–0.008	0.004–0.008	0.003–0.006	0.003–0.006	0.003–0.006	0.004–0.011	0.004–0.008	0.004–0.011
	0.4	0.004–0.010	0.004–0.010	0.003–0.007	0.003–0.007	0.003–0.007	0.005–0.013	0.004–0.010	0.005–0.013
	0.45	0.004–0.011	0.004–0.011	0.004–0.008	0.004–0.008	0.004–0.008	0.006–0.015	0.004–0.011	0.006–0.015
	0.5	0.005–0.013	0.005–0.013	0.004–0.010	0.004–0.010	0.004–0.010	0.007–0.021	0.005–0.013	0.007–0.021
	0.6	0.006–0.015	0.006–0.015	0.004–0.011	0.004–0.011	0.004–0.011	0.008–0.026	0.006–0.015	0.008–0.026
	0.7	0.007–0.021	0.007–0.021	0.005–0.013	0.005–0.013	0.005–0.013	0.010–0.030	0.007–0.021	0.010–0.030
	0.75	0.010–0.026	0.010–0.026	0.006–0.015	0.006–0.015	0.006–0.015	0.012–0.033	0.010–0.026	0.012–0.033
	0.8	0.012–0.030	0.012–0.030	0.007–0.021	0.007–0.021	0.007–0.021	0.015–0.035	0.012–0.030	0.015–0.035
WHD...	0.25	0.002–0.004	0.002–0.004	0.002–0.004	0.002–0.004	0.002–0.004	0.003–0.006	0.002–0.004	0.003–0.006
	0.3	0.002–0.005	0.002–0.005	0.002–0.004	0.002–0.004	0.002–0.004	0.003–0.007	0.002–0.005	0.003–0.007
	0.35	0.003–0.006	0.003–0.006	0.002–0.005	0.002–0.005	0.002–0.005	0.004–0.008	0.003–0.006	0.004–0.008
	0.4	0.003–0.007	0.003–0.007	0.002–0.005	0.002–0.005	0.002–0.005	0.004–0.010	0.003–0.007	0.004–0.010
	0.45	0.004–0.008	0.004–0.008	0.003–0.006	0.003–0.006	0.003–0.006	0.004–0.011	0.004–0.008	0.004–0.011
	0.5	0.004–0.010	0.004–0.010	0.003–0.007	0.003–0.007	0.003–0.007	0.005–0.013	0.004–0.010	0.005–0.013
	0.6	0.004–0.011	0.004–0.011	0.004–0.008	0.004–0.008	0.004–0.008	0.006–0.015	0.004–0.011	0.006–0.015
	0.7	0.005–0.013	0.005–0.013	0.004–0.010	0.004–0.010	0.004–0.010	0.007–0.021	0.005–0.013	0.007–0.021
	0.75	0.006–0.015	0.006–0.015	0.004–0.011	0.004–0.011	0.004–0.011	0.008–0.026	0.006–0.015	0.008–0.026
	0.8	0.007–0.021	0.007–0.021	0.005–0.013	0.005–0.013	0.005–0.013	0.010–0.030	0.007–0.021	0.010–0.030

Werkstoffe | Matières | Materials

	Stahl unlegiert Acier non allié Steel unalloyed			Stahl niedriglegiert Acier faibl. allié Steel low alloyed			Stahl hochlegiert Acier fortem. allié Steel high alloyed			Titan Titane Titanium		
Härte (HB) Dureté (HB) Hardness value (HB)	125–300			180–250			200–350			–		
Kategorie Catégorie Category	I			II			III			IV		
Bearbeitung Usinage Machining method	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼

Schnittgeschwindigkeiten (v_c) | Vitesses de coupe (v_c) | Cutting speeds (v_c)

Schneidstoff Hartmetall Matériaux de coupe carbure Cutting material carbide	v _c (m/min)			v _c (m/min)			v _c (m/min)			v _c (m/min)		
UHM 20	–	–	20–120	–	–	20–100	–	–	20–90	–	–	20–70
UHM 20 SX	–	–	30–140	–	–	30–120	–	–	30–110	–	–	30–80
UHM 20 HX	–	–	30–160	–	–	30–140	–	–	30–130	–	–	30–100

Werkstoffe | Matières | Materials

	Rostfreier Stahl Acier inoxydable Stainless steel			Rostfreier Stahl Acier inoxydable Stainless steel			Aluminium Aluminium Aluminium			Messing Laiton Brass		
Härte (HB) Dureté (HB) Hardness value (HB)	180–220			220–330			60–130			–		
Kategorie Catégorie Category	V			VI			VII			VIII		
Bearbeitung Usinage Machining method	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼

Schnittgeschwindigkeiten (v_c) | Vitesses de coupe (v_c) | Cutting speeds (v_c)

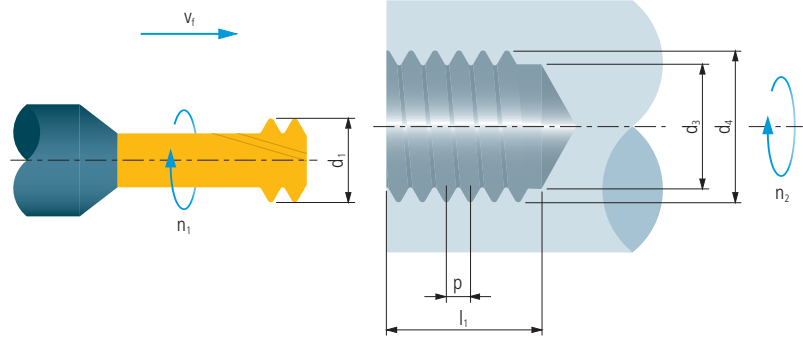
Schneidstoff Hartmetall Matériaux de coupe carbure Cutting material carbide	v _c (m/min)			v _c (m/min)			v _c (m/min)			v _c (m/min)		
UHM 20	–	–	20–80	–	–	20–60	–	–	50–220	–	–	30–110
UHM 20 SX	–	–	30–100	–	–	30–80	–	–	60–300	–	–	50–150
UHM 20 HX	–	–	30–120	–	–	30–100	–	–	60–350	–	–	50–180

Sorte Nuance Grade	Normbezeichnung Norme Norm	Zähigkeit des Schneidstoffs Tenacité du matériau de coupe Toughness of cutting grades												Werkstoffe (Kategorie) Matières (Catégorie) Materials (Category)							
		Härte (HB) Dureté (HB) Hardness value (HB) 												125 – 300	180 – 250	200 – 350		180 – 220	220 – 330	60 – 130	
		01	05	10	15	20	25	30	35	40	45	50	Stahl unlegiert Acier non allié Steel non-alloyed (I)	Stahl niedrig legiert Acier faibl. allié Steel low alloyed (II)	Stahl hochlegiert Acier fortem. allié Steel high alloyed (III)	Titan Titane Titanium (IV)	Rostfreier Stahl Acier inoxydable Stainless steel (V)	Rostfreier Stahl Acier inoxydable Stainless steel (VI)	Aluminium Aluminium (VII)	Messing Laiton Brass (VIII)	
Hartmetall Carbure Carbide																					
UHM 20	K 20/M 20												●	○	○	○	○	○	●	●	
UHM 20 HX	K 20/M 20												●	●	●	●	●	●	○	○	

$$v_f = z \cdot f_z \cdot n_1$$

$$n_1 = \frac{V_c \cdot 1000}{\pi \cdot d_1}$$

$$n_2 = \frac{V_f}{\pi \cdot d_1}$$



Erklärung

v_f = Vorschub des Werkzeuges (mm/min)
 d_1 = Gewindedurchmesser Werkzeug (mm)
 n_1 = Drehzahl Werkzeug (U/min)
 d_4 = Gewindedurchmesser Werkstück (mm)
 n_2 = Drehzahl Werkstück (U/min)
 v_c = Schnittgeschwindigkeit (m/min)
 p = Steigung (mm)
 l_1 = Länge des Gewindegangs (mm)
 z = Zahl der Zähne
 d_3 = Bohrungsdurchmesser (mm)
 f_z = Vorschub pro Zahn (mm)

Commentaires

v_f = avance de l'outil (mm/min)
 d_1 = diamètre de l'outil (mm)
 n_1 = tour par minute de l'outil (tr/min)
 d_4 = diamètre de la pièce (mm)
 n_2 = tour par minute de la pièce (tr/min)
 v_c = vitesse de coupe (m/min)
 p = pas (mm)
 l_1 = longueur développée du filet (mm)
 z = nombre de dents
 d_3 = diamètre de perçage (mm)
 f_z = avance par dent (mm)

Explanation

v_f = feed (mm/min)
 d_1 = tool diameter (mm)
 n_1 = tool revolutions (rev/min)
 d_4 = work piece diameter (mm)
 n_2 = revolutions (rev/min)
 v_c = cutting speed (m/min)
 p = pitch (mm)
 l_1 = length of one milling pass (mm)
 z = number of teeth
 d_3 = drilling diameter (mm)
 f_z = feed per tooth (mm)

Bestimmung des Bohrungsdurchmessers

Zur Vorbereitung des Bohrens, vor dem Gewinde-wirbeln, ist es als erstes nötig, die Toleranzen des gewünschten Gewindes zu kennen. Um Überlas-tung des Werkzeugs zu vermeiden, darf der max. Durchmesser, wie die folgende Tabelle zeigt, nicht überschritten werden.

Beispiel: M 1.40 Steigung 0.30, gewünschte Ge-windetoleranz 6H mit Höhe (1.11).
 Bohrungsdurchmesser = $1.110 - (2 \times 0.04) = 1.03$ mm minimum.

Définir le diamètre de perçage

Lors de la préparation du perçage avant tour-billonnage, il est nécessaire de connaître préala-blement la tolérance à inscrire au filetage. Pour éviter une surcharge sur l'outil, le diamètre ne doit pas dépasser la surépaisseur max. au D inscrite ci-dessous.

Exemple: M 1.40 pas 0.30, tolérance désirée sur le filet 6H au plus fort (1.11). Diamètre de perçage mini = $1.110 - (2 \times 0.04) = 1.03$ mm minimum.

Determine the drilling diameter

For the preparation of drilling before thread whirl-ing, it is necessary to know at first the tolerance of the desired thread. To avoid overload of the tool the diameter must not exceed the max. diameter as mentioned in the following table.

Example: M 1.40 pitch 0.30, tolerance desired of the thread 6H on high level (1.11).
 Diameter of the hole to be drilled min = $1.110 - (2 \times 0.04) = 1.03$ mm min.

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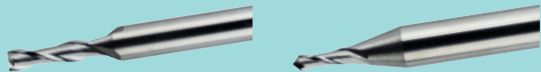
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MULTIDEC®-MILL

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UNM 20									
D (mm)	Stahl (unlegiert) Steel (un alloy)		Stahl (hochlegiert) Steel (high alloy)		Stahl (hochlegiert) Steel (high alloy)		Stahl (hochlegiert) Steel (high alloy)		ISO
	v_c (m/min)	f_z (mm/tooth)	v_c (m/min)	f_z (mm/tooth)	v_c (m/min)	f_z (mm/tooth)	v_c (m/min)	f_z (mm/tooth)	
0.1	12000	15	12000	15	-	-	-	-	-
0.2	12000	30	12000	30	-	-	-	-	-
0.3	12000	45	12000	45	-	-	-	-	-
0.4	12000	60	12000	60	-	-	-	-	-

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Multidec®-Mill bietet eine grosse Auswahl an Fräsern mit kurzen/langen Schneiden und mit/ohne Hinterschliff. Die Schaftdurchmesser variieren entsprechend dem Fräsdurchmesser, was sich in den verschiedenen Typen widerspiegelt.

Das komplette Programm beinhaltet Durchmesser von 0.1–12 mm, wobei die Fräser von Ø 0.1–6.0 mm in 0.01 mm Schritten erhältlich sind. Für den Durchmesserbereich ab Ø 6.0 mm bieten wir einige Fräser zur generellen Bearbeitung an.

Die breite Palette von Multidec®-Mill ist in vielen Schneidlängen und möglichen Frästiefen erhältlich. Zudem bieten wir unbeschichtete und HX-beschichtete (TiAlN) Werkzeuge sowie Qualitäten in UHM 10 (K10/M10) und UHM 20 (K20/M20) an. Dies gestattet Ihnen, immer das passende Fräs Werkzeug für Ihre Decolletage- und Mikro-mechanik-Anwendung in unserem Multidec®-Mill Programm zu finden.

Multidec®-Mill offre un grand choix de fraises, aux longueurs utiles courtes ou longues et aux diamètres de queue conformes et en rapport au diamètre nominal.

Le programme complet débute au diamètre 0.1 mm jusqu'au diamètre de 12 mm. A partir du Ø 0.1 mm jusqu'au Ø 6 mm les fraises sont disponibles tous les 1/100 mm. Dès le Ø 6 mm nous proposons des fraises de dimensions standards et pour un emploi général.

La large palette Multidec®-Mill est disponible dans un grand choix de longueurs utiles. En outre, nous proposons des outils non revêtus ou avec revêtement TiAlN. La qualité de nos carbures sont l'UHM 10 (K10 / M10) et UHM 30 (K20 / M20). Ces différentes nuances et revêtements vous permettent de trouver l'outil adéquat pour les opérations de fraisage dans le domaine de la micro mécanique et le decolletage.

Multidec®-Mill offers a large selection of mills with short/long cutting edges and with/without under neck relieve. The shank diameters vary according to the milling diameter, which reflects itself in the different types.

The complete program contains diameters of 0.1–12 mm, where the mills of Ø 0.1–6.0 mm are available with steps of 0.01 mm. For the diameter range above Ø 6.0 mm we offer mills for general machining.

The broad range of Multidec®-Mill is available in many different lengths and possible milling depths. Besides we offer uncoated and HX-coated (TiAlN) tools as well as qualities in UHM 10 (K10/M10) and UHM 20 (K20/M20). This permits you to always find the suitable milling tool for your swiss type turning and application of micro mechanics in our Multidec®-Mill program.



Vorteile

- Umfangreiche Auswahl
- Viele Schneidendurchmesser in vielen verschiedenen Längen
- Hinterschliffene Fräser und solche mit langen Schneiden
- Ø 1.0 Eckfräser (MMS) in 22 Varianten
- Ø 1.0 Kugelfräser (MMB) in 13 Varianten
- Ø 1.0 Radiusfräser (MMR) in 11 Varianten
- Unbeschichtet und beschichtet
- UHM 10 und UHM 20

Avantages

- Vaste choix
- Grand choix de diamètres et de longueurs utiles
- Fraises dégagées à l'arrière pour les longueurs utiles importantes
- Ø 1.0 Fraise deux tailles à queue cylindrique (MMS) en 22 variantes
- Ø 1.0 Fraise boule deux tailles à queue cylindrique (MMB) en 13 variantes
- Ø 1.0 Fraise torique deux tailles à queue cylindrique (MMR) en 11 variantes
- Disponibles non revêtues et avec revêtement TiAlN
- Nuances carbures UHM 10 et UHM 20

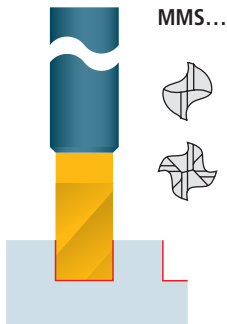
Advantages

- extensive selection
- many cutting diameters in many different length
- mills with under neck diameter and such with long cutting edges
- Ø 1.0 sharp corner end mills (MMS) in 22 types
- Ø 1.0 ball end mills (MMB) in 13 types
- Ø 1.0 radius end mills (MMR) in 11 types
- uncoated and coated
- UHM 10 and UHM 20

Nuten-/Seitenfräsen
Rainures/contours
Slotting/edge cutting

Fräser | Fraises | Milling cutter

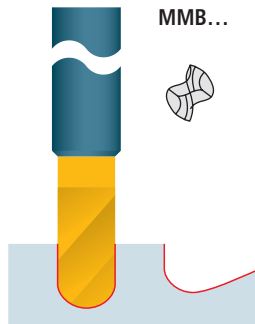
□ 261...



Nuten-/Taschenfräsen (Vollradius)
Rainures/poches (Rayon)
Slotting/form- and die cutting

Fräser | Fraises | Milling cutter

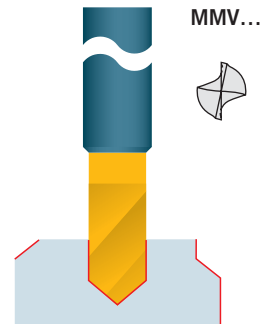
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Nuten-/Kanten-/Fasfräsen
Rainures/arêtes/chanfreins
Slotting/edge cutting/chamfer

Fräser | Fraises | Milling cutter

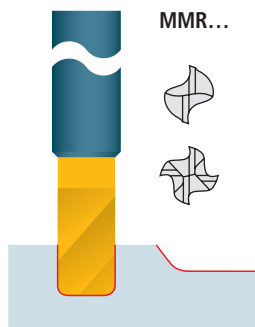
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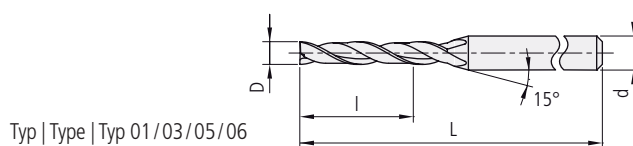
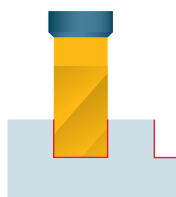
Nuten-/Taschenfräsen (torisch)
Rainures/poches (torique)
Slotting/form- and die cutting

Fräser | Fraises | Milling cutter

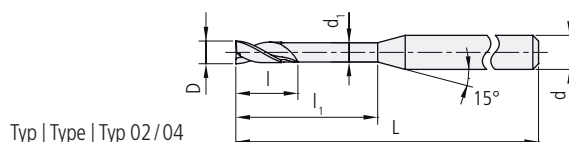
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Nuten-/Seitenfräsen | Rainures/contours | Slotting/edge cutting



Typ | Type | Typ 01/03/05/06

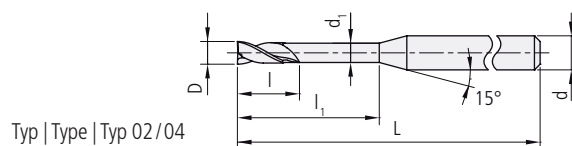
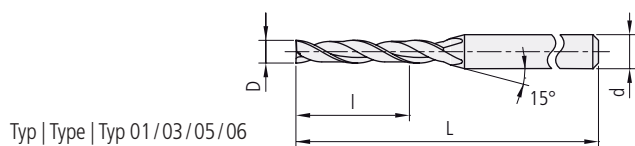


Typ | Type | Typ 02/04

Bezeichnung Désignation Designation	Hartmetall Carbure Carbide				Dimensionen Dimensions Dimensions							Typ Type Typ
	—	○	●	□	D	l	l ₁	d ₁	z	L	d	
MMS...	○	●	—	□	0/-0.01						0/-0.008	
	... UHM 10	... UHM 10 HX	... UHM 20	... UHM 20 HX								
MMS 0010 002 201			■	□	0.1	0.2			2	40	3	01
MMS 0010 005 201			■	□	0.1	0.5			2	40	3	01
MMS 0010 007 201			□		0.1	0.7			2	40	3	01
MMS 0010 010 201			■	□	0.1	1			2	40	3	01
MMS 0011 002 201			□		0.11	0.2			2	40	3	01
MMS 0012 003 201			□		0.12	0.3			2	40	3	01
MMS 0013 003 201			□		0.13	0.3			2	40	3	01
MMS 0014 003 201			□		0.14	0.3			2	40	3	01
MMS 0015 003 201			□		0.15	0.3			2	40	3	01
MMS 0015 005 201			□		0.15	0.5			2	40	3	01
MMS 0015 010 201			■	□	0.15	1			2	40	3	01
MMS 0015 015 201			□		0.15	1.5			2	40	3	01
MMS 0016 003 201			□		0.16	0.3			2	40	3	01
MMS 0017 003 201			□		0.17	0.3			2	40	3	01
MMS 0018 003 201			□		0.18	0.3			2	40	3	01
MMS 0019 003 201			□		0.19	0.3			2	40	3	01
MMS 0020 004 201			■	□	0.2	0.4			2	40	3	01
MMS 0020 005 202			□		0.2	0.3	0.5	0.18	2	40	4	02
MMS 0020 006 203	□				0.2	0.6			2	45	4	03
MMS 0020 010 201			■	□	0.2	1			2	40	3	01
MMS 0020 010 202			□		0.2	0.3	1	0.18	2	40	4	02
MMS 0020 015 201			□		0.2	1.5			2	40	3	01
MMS 0020 015 202			□		0.2	0.3	1.5	0.18	2	40	4	02
MMS 0020 020 201			■	□	0.2	2			2	40	3	01
MMS 0020 020 202			■	□	0.2	0.3	2	0.18	2	40	4	02
MMS 0020 030 202			□		0.2	0.3	3	0.18	2	40	4	02
MMS 0020 040 202			□		0.2	0.3	4	0.18	2	40	4	02
MMS 0020 050 202			□		0.2	0.3	5	0.18	2	40	4	02
MMS 0021 005 201			□		0.21	0.5			2	40	3	01
MMS 0022 005 201			□		0.22	0.5			2	40	3	01
MMS 0023 005 201			□		0.23	0.5			2	40	3	01
MMS 0024 005 201			□		0.24	0.5			2	40	3	01
MMS 0025 005 201			■	□	0.25	0.5			2	40	3	01
MMS 0025 010 201			■	□	0.25	1			2	40	3	01
MMS 0025 020 201			■	□	0.25	2			2	40	3	01
MMS 0025 025 201			□		0.25	2.5			2	40	3	01
MMS 0026 008 201			□		0.26	0.8			2	40	3	01
MMS 0027 008 201			■	□	0.27	0.8			2	40	3	01
MMS 0028 008 201			■	□	0.28	0.8			2	40	3	01
MMS 0029 008 201			□		0.29	0.8			2	40	3	01
MMS 0030 010 201			■	□	0.3	1			2	40	3	01
MMS 0030 010 202			□		0.3	0.4	1	0.28	2	40	4	02

Nuten-/Seitenfräsen | Rainures/contours | Slotting/edge cutting

Fortsetzung | Suite | Continuation

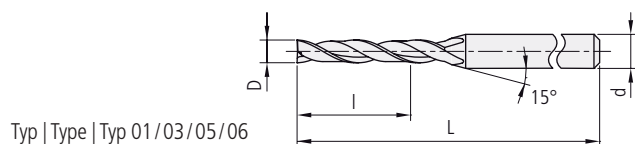


Bezeichnung Désignation Designation	Hartmetall Carbure Carbide				Dimensionen Dimensions Dimensions							Typ Type Typ
	—	○	●	■	D	l	l ₁	d ₁	z	L	d	
MMS...	—	○	●	■	0/-0.01						0/-0.008	
	UHM 10	UHM 10 HX	UHM 20	UHM 20 HX								
MMS 0030 010 203	■				0.3	1			2	45	4	03
MMS 0030 015 201			■	□	0.3	1.5			2	40	3	01
MMS 0030 020 201			■	□	0.3	2			2	40	3	01
MMS 0030 020 202			□		0.3	0.4	2	0.28	2	40	4	02
MMS 0030 020 204	□				0.3	0.6	2	0.27	2	45	4	04
MMS 0030 030 201			■	□	0.3	3			2	40	3	01
MMS 0030 030 202			■	□	0.3	0.4	3	0.28	2	40	4	02
MMS 0030 040 202			■	□	0.3	0.4	4	0.28	2	40	4	02
MMS 0030 040 204	□				0.3	0.6	4	0.27	2	45	4	04
MMS 0030 060 202			□		0.3	0.4	6	0.28	2	50	4	02
MMS 0030 060 204	□				0.3	0.6	6	0.27	2	45	4	04
MMS 0030 080 202			□		0.3	0.4	8	0.28	2	50	4	02
MMS 0030 100 202			□		0.3	0.4	10	0.28	2	50	4	02
MMS 0031 010 201			□		0.31	1			2	40	3	01
MMS 0032 010 201			□		0.32	1			2	40	3	01
MMS 0033 010 201			□		0.33	1			2	40	3	01
MMS 0034 010 201			□		0.34	1			2	40	3	01
MMS 0035 010 201			■	□	0.35	1			2	40	3	01
MMS 0035 020 201			□		0.35	2			2	40	3	01
MMS 0035 030 201			□		0.35	3			2	40	3	01
MMS 0035 040 201			□		0.35	4			2	40	3	01
MMS 0036 010 201			□		0.36	1			2	40	3	01
MMS 0037 010 201			□		0.37	1			2	40	3	01
MMS 0038 010 201			□		0.38	1			2	40	3	01
MMS 0039 010 201			□		0.39	1			2	40	3	01
MMS 0040 010 201			■	□	0.4	1			2	40	3	01
MMS 0040 015 203	■				0.4	1.5			2	45	4	03
MMS 0040 020 201			■	□	0.4	2			2	40	3	01
MMS 0040 020 202			□		0.4	0.6	2	0.37	2	40	4	02
MMS 0040 020 204	□				0.4	0.8	2	0.37	2	45	4	04
MMS 0040 030 201			■	□	0.4	3			2	40	3	01
MMS 0040 030 202			□		0.4	0.6	3	0.37	2	40	4	02
MMS 0040 040 201			■	□	0.4	4			2	40	3	01
MMS 0040 040 202			■	□	0.4	0.6	4	0.37	2	40	4	02
MMS 0040 040 204	□				0.4	0.8	4	0.37	2	45	4	04
MMS 0040 060 202			■	□	0.4	0.6	6	0.37	2	50	4	02
MMS 0040 060 204	□				0.4	0.8	6	0.37	2	45	4	04
MMS 0040 080 202			□		0.4	0.6	8	0.37	2	50	4	02
MMS 0040 100 202			□		0.4	0.6	10	0.37	2	50	4	02
MMS 0041 010 201			□		0.41	1			2	40	3	01
MMS 0042 010 201			□		0.42	1			2	40	3	01
MMS 0043 010 201			□		0.43	1			2	40	3	01
MMS 0044 010 201			□		0.44	1			2	40	3	01
MMS 0045 010 201			□		0.45	1			2	40	3	01
MMS 0045 030 201			□		0.45	3			2	40	3	01
MMS 0045 040 201			□		0.45	4			2	40	3	01
MMS 0045 050 201			□		0.45	5			2	40	3	01
MMS 0046 010 201			■	□	0.46	1			2	40	3	01
MMS 0047 010 201			□		0.47	1			2	40	3	01
MMS 0048 010 201			□		0.48	1			2	40	3	01

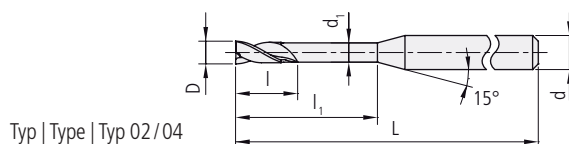
Legende | Légende | Legend □ 4

Nuten-/Seitenfräsen | Rainures/contours | Slotting/edge cutting

Fortsetzung | Suite | Continuation



Typ | Type | Typ 01/03/05/06

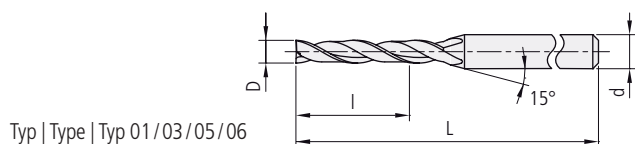


Typ | Type | Typ 02/04

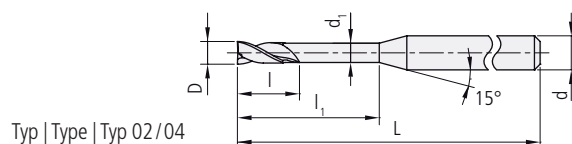
Bezeichnung Désignation Designation	Hartmetall Carbure Carbide				Dimensionen Dimensions Dimensions								Typ Type Typ
	330				D	l	l ₁	d ₁	z	L	d		
	—	○	●	●									
	—	●	—	●									
MMS...	○	●	—	—	0/-0.01						0/-0.008		
	●	●	—	—									
	... UHM 10	... UHM 10 HX	... UHM 20	... UHM 20 HX									
MMS 0049 010 201			□		0.49	1			2	40	3	01	
MMS 0050 010 201			■	■	0.5	1			2	40	3	01	
MMS 0050 010 401				□	0.5	1			4	60	3	01	
MMS 0050 015 203	■	■			0.5	1.5			2	45	4	03	
MMS 0050 020 201			■	■	0.5	2			2	40	3	01	
MMS 0050 020 202			□	□	0.5	0.7	2	0.46	2	40	4	02	
MMS 0050 020 204	□	□			0.5	1	2	0.45	2	45	4	04	
MMS 0050 025 201			■	■	0.5	2.5			2	40	3	01	
MMS 0050 030 201			■	■	0.5	3			2	40	3	01	
MMS 0050 035 201			■	■	0.5	3.5			2	40	3	01	
MMS 0050 040 201			■	■	0.5	4			2	40	3	01	
MMS 0050 040 202			■	■	0.5	0.7	4	0.46	2	40	4	02	
MMS 0050 040 204	■	■			0.5	1	4	0.45	2	45	4	04	
MMS 0050 050 201			■	■	0.5	5			2	40	3	01	
MMS 0050 060 202			■	■	0.5	0.7	6	0.46	2	50	4	02	
MMS 0050 060 204	■	■			0.5	1	6	0.45	2	45	4	04	
MMS 0050 080 202			■	■	0.5	0.7	8	0.46	2	50	4	02	
MMS 0050 080 204	□	□			0.5	1	8	0.45	2	45	4	04	
MMS 0050 100 202			■	■	0.5	0.7	10	0.46	2	50	4	02	
MMS 0050 100 204	□	□			0.5	1	10	0.45	2	50	4	04	
MMS 0050 120 202			□	□	0.5	0.7	12	0.46	2	50	4	02	
MMS 0050 160 202			□	□	0.5	0.7	16	0.46	2	60	4	02	
MMS 0050 200 202			■	■	0.5	0.7	20	0.46	2	60	4	02	
MMS 0051 010 201			□	□	0.51	1			2	40	3	01	
MMS 0052 010 201			■	■	0.52	1			2	40	3	01	
MMS 0053 010 201			□	□	0.53	1			2	40	3	01	
MMS 0054 010 201			□	□	0.54	1			2	40	3	01	
MMS 0055 010 201			□	□	0.55	1			2	40	3	01	
MMS 0055 030 201			□	□	0.55	3			2	40	3	01	
MMS 0055 040 201			□	□	0.55	4			2	40	3	01	
MMS 0055 050 201			□	□	0.55	5			2	40	3	01	
MMS 0056 010 201			□	□	0.56	1			2	40	3	01	
MMS 0057 010 201			□	□	0.57	1			2	40	3	01	
MMS 0058 010 201			□	□	0.58	1			2	40	3	01	
MMS 0059 010 201			□	□	0.59	1			2	40	3	01	
MMS 0060 020 201			■	■	0.6	2			2	40	3	01	
MMS 0060 020 202			□	□	0.6	0.9	2	0.56	2	40	4	02	
MMS 0060 020 203	■	■			0.6	2			2	45	4	03	
MMS 0060 020 401				□	0.6	2			4	60	3	01	
MMS 0060 030 201			■	■	0.6	3			2	40	3	01	
MMS 0060 040 201			■	■	0.6	4			2	40	3	01	
MMS 0060 040 202			□	□	0.6	0.9	4	0.56	2	40	4	02	
MMS 0060 040 204	□	□			0.6	1.2	4	0.55	2	45	4	04	
MMS 0060 050 201			■	■	0.6	5			2	40	3	01	
MMS 0060 060 202			■	■	0.6	0.9	6	0.56	2	50	4	02	
MMS 0060 060 204	□	□			0.6	1.2	6	0.55	2	45	4	04	
MMS 0060 080 202			■	■	0.6	0.9	8	0.56	2	50	4	02	
MMS 0060 100 202			■	■	0.6	0.9	10	0.56	2	50	4	02	
MMS 0060 100 204	□	□			0.6	1.2	10	0.55	2	50	4	04	
MMS 0060 120 202			□	□	0.6	0.9	12	0.56	2	50	4	02	

Nuten-/Seitenfräsen | Rainures/contours | Slotting/edge cutting

Fortsetzung | Suite | Continuation



Typ | Type | Typ 01/03/05/06

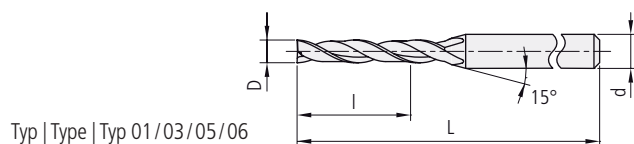


Typ | Type | Typ 02/04

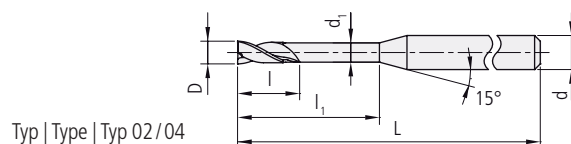
Bezeichnung Désignation Designation	Hartmetall Carbure Carbide				Dimensionen Dimensions Dimensions							Typ Type Typ
	330	330	330	330	D	l	l ₁	d ₁	z	L	d	
MMS...	0/0.01	0/0.01	0/0.01	0/0.01	0/0.01	0/0.01	0/0.01	0/0.01	0/0.01	0/0.01	0/0.008	
	UHM 10	UHM 10 HX	UHM 20	UHM 20 HX								
MMS 0060 160 202			□	□	0.6	0.9	16	0.56	2	60	4	02
MMS 0060 200 202			■	■	0.6	0.9	20	0.56	2	60	4	02
MMS 0061 020 201			□	□	0.61	2			2	40	3	01
MMS 0062 020 201			□	□	0.62	2			2	40	3	01
MMS 0063 020 201			□	□	0.63	2			2	40	3	01
MMS 0064 020 201			□	□	0.64	2			2	40	3	01
MMS 0065 020 201			□	□	0.65	2			2	40	3	01
MMS 0065 030 201			□	□	0.65	3			2	40	3	01
MMS 0065 045 201			□	□	0.65	4.5			2	40	3	01
MMS 0065 060 201			□	□	0.65	6			2	40	3	01
MMS 0066 020 201			□	□	0.66	2			2	40	3	01
MMS 0067 020 201			□	□	0.67	2			2	40	3	01
MMS 0068 020 201			□	□	0.68	2			2	40	3	01
MMS 0069 020 201			■	■	0.69	2			2	40	3	01
MMS 0070 020 201			■	■	0.7	2			2	40	3	01
MMS 0070 020 202			□	□	0.7	1	2	0.66	2	40	4	02
MMS 0070 020 203	□	□			0.7	2			2	45	4	03
MMS 0070 020 401				□	0.7	2			4	60	3	01
MMS 0070 030 201			■	■	0.7	3			2	40	3	01
MMS 0070 040 201			■	■	0.7	4			2	40	3	01
MMS 0070 040 202			□	□	0.7	1	4	0.66	2	40	4	02
MMS 0070 040 204	□	□			0.7	1.4	4	0.65	2	45	4	04
MMS 0070 050 201			■	■	0.7	5			2	40	3	01
MMS 0070 060 201			■	■	0.7	6			2	40	3	01
MMS 0070 060 202			■	■	0.7	1	6	0.66	2	50	4	02
MMS 0070 060 204	□	□			0.7	1.4	6	0.65	2	45	4	04
MMS 0070 080 202			□	□	0.7	1	8	0.66	2	50	4	02
MMS 0070 100 202			□	□	0.7	1	10	0.66	2	50	4	02
MMS 0070 100 204	□	□			0.7	1.4	10	0.65	2	50	4	04
MMS 0070 120 202			□	□	0.7	1	12	0.66	2	50	4	02
MMS 0070 160 202			□	□	0.7	1	16	0.66	2	60	4	02
MMS 0070 200 202			■	■	0.7	1	20	0.66	2	60	4	02
MMS 0071 020 201			■	■	0.71	2			2	40	3	01
MMS 0072 020 201			■	■	0.72	2			2	40	3	01
MMS 0073 020 201			■	■	0.73	2			2	40	3	01
MMS 0074 020 201			□	□	0.74	2			2	40	3	01
MMS 0075 020 201			■	■	0.75	2			2	40	3	01
MMS 0075 040 201			■	■	0.75	4			2	40	3	01
MMS 0075 060 201			□	□	0.75	6			2	40	3	01
MMS 0075 080 201			□	□	0.75	8			2	40	3	01
MMS 0076 020 201			□	□	0.76	2			2	40	3	01
MMS 0077 020 201			□	□	0.77	2			2	40	3	01
MMS 0078 020 201			□	□	0.78	2			2	40	3	01
MMS 0079 020 201			□	□	0.79	2			2	40	3	01
MMS 0080 025 201			■	■	0.8	2.5			2	40	3	01
MMS 0080 025 203	■	■			0.8	2.5			2	45	4	03
MMS 0080 025 401				□	0.8	2.5			4	60	3	01
MMS 0080 030 201			■	■	0.8	3			2	40	3	01
MMS 0080 035 201			■	■	0.8	3.5			2	40	3	01
MMS 0080 040 201			■	■	0.8	4			2	40	3	01

Nuten-/Seitenfräsen | Rainures/contours | Slotting/edge cutting

Fortsetzung | Suite | Continuation



Typ | Type | Typ 01/03/05/06

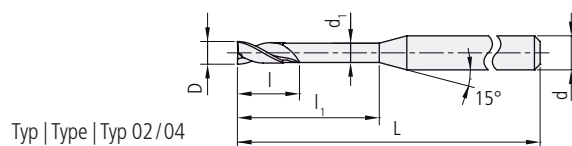
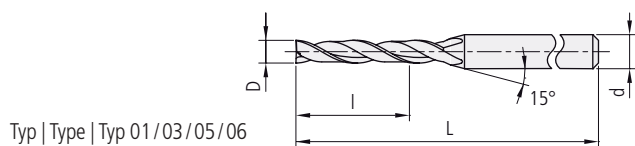


Typ | Type | Typ 02/04

Bezeichnung Désignation Designation	Hartmetall Carbure Carbide				Dimensionen Dimensions Dimensions								Typ Type Typ
					D	l	l ₁	d ₁	z	L	d		
	—	○	●	●									
	—	●	—	●									
MMS...	○	●	—	—	0/-0.01						0/-0.008		
	●	●	—	—									
	...	...	...	...									
	...	...	...	...									
MMS 0080 040 202			□	□	0.8	1.2	4	0.76	2	40	4		02
MMS 0080 060 201			■	■	0.8	6			2	40	3		01
MMS 0080 060 202			□	□	0.8	1.2	6	0.76	2	50	4		02
MMS 0080 060 204	□	□			0.8	1.6	6	0.75	2	45	4		04
MMS 0080 080 201			■	■	0.8	8			2	40	3		01
MMS 0080 080 202			■	■	0.8	1.2	8	0.76	2	50	4		02
MMS 0080 080 204	□	□			0.8	1.6	8	0.75	2	45	4		04
MMS 0080 100 201			■	■	0.8	10			2	40	3		01
MMS 0080 100 202			■	■	0.8	1.2	10	0.76	2	50	4		02
MMS 0080 120 202			■	■	0.8	1.2	12	0.76	2	50	4		02
MMS 0080 120 204	□	□			0.8	1.6	12	0.75	2	50	4		04
MMS 0080 160 202			□	□	0.8	1.2	16	0.76	2	60	4		02
MMS 0080 200 202			■	■	0.8	1.2	20	0.76	2	60	4		02
MMS 0081 025 201			□	□	0.81	2.5			2	40	3		01
MMS 0082 025 201			□	□	0.82	2.5			2	40	3		01
MMS 0083 025 201			□	□	0.83	2.5			2	40	3		01
MMS 0084 025 201			□	□	0.84	2.5			2	40	3		01
MMS 0085 025 201			□	□	0.85	2.5			2	40	3		01
MMS 0085 050 201			■	■	0.85	5			2	40	3		01
MMS 0085 060 201			□	□	0.85	6			2	40	3		01
MMS 0085 080 201			□	□	0.85	8			2	40	3		01
MMS 0086 025 201			□	□	0.86	2.5			2	40	3		01
MMS 0087 025 201			□	□	0.87	2.5			2	40	3		01
MMS 0088 025 201			□	□	0.88	2.5			2	40	3		01
MMS 0089 025 201			■	■	0.89	2.5			2	40	3		01
MMS 0090 025 201			■	■	0.9	2.5			2	40	3		01
MMS 0090 025 401				□	0.9	2.5			4	60	3		01
MMS 0090 030 203	□	□			0.9	3			2	45	4		03
MMS 0090 050 201			■	■	0.9	5			2	40	3		01
MMS 0090 060 201			□	□	0.9	6			2	40	3		01
MMS 0090 060 202			■	■	0.9	1.4	6	0.86	2	50	4		02
MMS 0090 060 204	□	□			0.9	1.8	6	0.85	2	45	4		04
MMS 0090 080 201			■	■	0.9	8			2	40	3		01
MMS 0090 080 202			■	■	0.9	1.4	8	0.86	2	50	4		02
MMS 0090 080 204	□	□			0.9	1.8	8	0.85	2	45	4		04
MMS 0090 100 202			□	□	0.9	1.4	10	0.86	2	50	4		02
MMS 0090 120 202			□	□	0.9	1.4	12	0.86	2	50	4		02
MMS 0090 120 204	□	□			0.9	1.8	12	0.85	2	50	4		04
MMS 0090 160 202			□	□	0.9	1.4	16	0.86	2	60	4		02
MMS 0090 200 202			■	■	0.9	1.4	20	0.86	2	60	4		02
MMS 0091 025 201			□	□	0.91	2.5			2	40	3		01
MMS 0092 025 201			□	□	0.92	2.5			2	40	3		01
MMS 0093 025 201			□	□	0.93	2.5			2	40	3		01
MMS 0094 025 201			□	□	0.94	2.5			2	40	3		01
MMS 0095 025 201			□	□	0.95	2.5			2	40	3		01
MMS 0095 060 201			■	■	0.95	6			2	40	3		01
MMS 0095 080 201			□	□	0.95	8			2	40	3		01
MMS 0095 100 201			□	□	0.95	10			2	40	3		01
MMS 0096 025 201			□	□	0.96	2.5			2	40	3		01
MMS 0097 025 201			■	■	0.97	2.5			2	40	3		01

Nuten-/Seitenfräsen | Rainures/contours | Slotting/edge cutting

Fortsetzung | Suite | Continuation

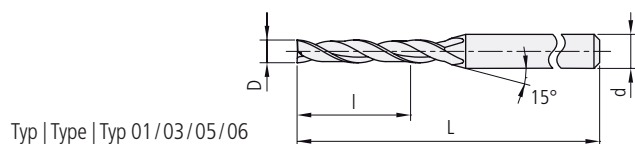


Bezeichnung Désignation Designation	Hartmetall Carbure Carbide				Dimensionen Dimensions Dimensions							Typ Type Typ
	—	○	●	●	D	l	l ₁	d ₁	z	L	d	
MMS...	—	○	●	●	0/-0.01						0/-0.008	
	UHM 10	UHM 10 HX	UHM 20	UHM 20 HX								
MMS 0098 025 201			□	□	0.98	2.5			2	40	3	01
MMS 0099 025 201			□	□	0.99	2.5			2	40	3	01
MMS 0100 030 201			■	■	1	3			2	40	3	01
MMS 0100 030 203	■	■			1	3			2	50	4	03
MMS 0100 030 401			■	■	1	3			4	60	3	01
MMS 0100 040 201			■	■	1	4			2	45	4	01
MMS 0100 060 201			■	■	1	6			2	45	4	01
MMS 0100 060 202			□	□	1	1.5	6	0.95	2	50	4	02
MMS 0100 060 204	□	□			1	2	6	0.9	2	50	4	04
MMS 0100 080 201			■	■	1	8			2	45	4	01
MMS 0100 080 202			■	■	1	1.5	8	0.95	2	50	4	02
MMS 0100 080 204	□	□			1	2	8	0.9	2	50	4	04
MMS 0100 100 201			■	■	1	10			2	45	4	01
MMS 0100 100 202			■	■	1	1.5	10	0.95	2	50	4	02
MMS 0100 100 204	■	■			1	2	10	0.9	2	50	4	04
MMS 0100 120 201			■	■	1	12			2	45	4	01
MMS 0100 120 202			■	■	1	1.5	12	0.95	2	50	4	02
MMS 0100 120 204	■	■			1	2	12	0.9	2	50	4	04
MMS 0100 160 202			■	■	1	1.5	16	0.95	2	60	4	02
MMS 0100 160 204	□	□			1	2	16	0.9	2	60	4	04
MMS 0100 200 202			■	■	1	1.5	20	0.95	2	60	4	02
MMS 0100 200 204	□	□			1	2	20	0.9	2	60	4	04
MMS 0100 250 202			□	□	1	1.5	25	0.95	2	70	4	02
MMS 0100 300 202			■	■	1	1.5	30	0.95	2	70	4	02
MMS 0101 030 201			□	□	1.01	3			2	40	3	01
MMS 0102 030 201			■	■	1.02	3			2	40	3	01
MMS 0103 030 201			■	■	1.03	3			2	40	3	01
MMS 0104 030 201			□	□	1.04	3			2	40	3	01
MMS 0105 030 201			□	□	1.05	3			2	40	3	01
MMS 0105 060 201			□	□	1.05	6			2	45	4	01
MMS 0105 080 201			□	□	1.05	8			2	45	4	01
MMS 0105 100 201			□	□	1.05	10			2	45	4	01
MMS 0106 030 201			□	□	1.06	3			2	40	3	01
MMS 0107 030 201			■	■	1.07	3			2	40	3	01
MMS 0108 030 201			□	□	1.08	3			2	40	3	01
MMS 0109 030 201			□	□	1.09	3			2	40	3	01
MMS 0110 030 201			□	□	1.1	3			2	40	3	01
MMS 0110 030 401			□	□	1.1	3			4	60	3	01
MMS 0110 060 201			■	■	1.1	6			2	45	4	01
MMS 0110 060 202			■	■	1.1	1.6	6	1.05	2	50	4	02
MMS 0110 080 201			□	□	1.1	8			2	45	4	01
MMS 0110 100 201			□	□	1.1	10			2	45	4	01
MMS 0110 120 202			■	■	1.1	1.6	12	1.05	2	50	4	02
MMS 0110 160 202			□	□	1.1	1.6	16	1.05	2	60	4	02
MMS 0110 200 202			□	□	1.1	1.6	20	1.05	2	60	4	02
MMS 0110 300 202			□	□	1.1	1.6	30	1.05	2	70	4	02
MMS 0111 030 201			□	□	1.11	3			2	40	3	01
MMS 0112 030 201			■	■	1.12	3			2	40	3	01
MMS 0113 030 201			□	□	1.13	3			2	40	3	01
MMS 0114 030 201			□	□	1.14	3			2	40	3	01

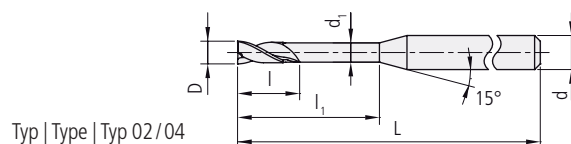
Legende | Légende | Legend □ 4

Nuten-/Seitenfräsen | Rainures/contours | Slotting/edge cutting

Fortsetzung | Suite | Continuation



Typ | Type | Typ 01/03/05/06

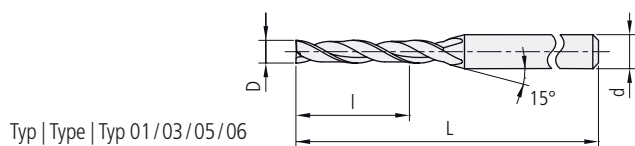


Typ | Type | Typ 02/04

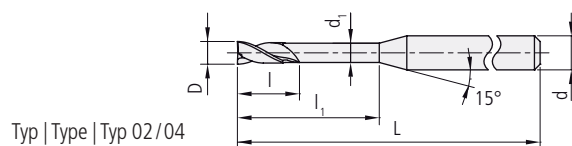
Bezeichnung Désignation Designation	Hartmetall Carbure Carbide				Dimensionen Dimensions Dimensions							Typ Type Typ
	330				D	l	l ₁	d ₁	z	L	d	
MMS...	●	○	●	●	0/-0.01						0/-0.008	
	UHM 10	UHM 10 HX	UHM 20	UHM 20 HX								
MMS 0115 030 201			■	■	1.15	3			2	40	3	01
MMS 0115 080 201			□	□	1.15	8			2	45	4	01
MMS 0115 100 201			□	□	1.15	10			2	45	4	01
MMS 0115 120 201			□	□	1.15	12			2	45	4	01
MMS 0116 030 201			□	□	1.16	3			2	40	3	01
MMS 0117 030 201			■	■	1.17	3			2	40	3	01
MMS 0118 030 201			□	□	1.18	3			2	40	3	01
MMS 0119 030 201			□	□	1.19	3			2	40	3	01
MMS 0120 030 201			■	■	1.2	3			2	40	3	01
MMS 0120 030 401			■	■	1.2	3			4	60	3	01
MMS 0120 040 203	□	□			1.2	4			2	50	4	03
MMS 0120 060 201			■	■	1.2	6			2	45	4	01
MMS 0120 060 202			□	□	1.2	1.8	6	1.15	2	50	4	02
MMS 0120 080 201			■	■	1.2	8			2	45	4	01
MMS 0120 080 204	□	□			1.2	2.4	8	1.1	2	50	4	04
MMS 0120 100 201			■	■	1.2	10			2	45	4	01
MMS 0120 120 201			■	■	1.2	12			2	45	4	01
MMS 0120 120 202			■	■	1.2	1.8	12	1.15	2	50	4	02
MMS 0120 120 204	□	□			1.2	2.4	12	1.1	2	50	4	04
MMS 0120 160 202			□	□	1.2	1.8	16	1.15	2	60	4	02
MMS 0120 160 204	□	□			1.2	2.4	16	1.1	2	60	4	04
MMS 0120 200 202			■	■	1.2	1.8	20	1.15	2	60	4	02
MMS 0120 300 202			■	■	1.2	1.8	30	1.15	2	70	4	02
MMS 0121 030 201			□	□	1.21	3			2	40	3	01
MMS 0122 030 201			■	■	1.22	3			2	40	3	01
MMS 0123 030 201			■	■	1.23	3			2	40	3	01
MMS 0124 030 201			□	□	1.24	3			2	40	3	01
MMS 0125 030 201			■	■	1.25	3			2	40	3	01
MMS 0125 080 201			■	■	1.25	8			2	45	4	01
MMS 0125 100 201			□	□	1.25	10			2	45	4	01
MMS 0125 120 201			□	□	1.25	12			2	45	4	01
MMS 0126 030 201			□	□	1.26	3			2	40	3	01
MMS 0127 030 201			□	□	1.27	3			2	40	3	01
MMS 0128 030 201			□	□	1.28	3			2	40	3	01
MMS 0129 030 201			□	□	1.29	3			2	40	3	01
MMS 0130 030 201			□	□	1.3	3			2	40	3	01
MMS 0130 030 401			□	□	1.3	3			4	60	3	01
MMS 0130 060 201			■	■	1.3	6			2	45	4	01
MMS 0130 060 202			■	■	1.3	1.9	6	1.25	2	50	4	02
MMS 0130 080 201			□	□	1.3	8			2	45	4	01
MMS 0130 100 201			■	■	1.3	10			2	45	4	01
MMS 0130 120 201			□	□	1.3	12			2	45	4	01
MMS 0130 120 202			■	■	1.3	1.9	12	1.25	2	50	4	02
MMS 0130 160 202			□	□	1.3	1.9	16	1.25	2	60	4	02
MMS 0130 200 202			□	□	1.3	1.9	20	1.25	2	60	4	02
MMS 0130 300 202			□	□	1.3	1.9	30	1.25	2	70	4	02
MMS 0131 030 201			□	□	1.31	3			2	40	3	01
MMS 0132 030 201			□	□	1.32	3			2	40	3	01
MMS 0133 030 201			□	□	1.33	3			2	40	3	01
MMS 0134 030 201			□	□	1.34	3			2	40	3	01

Nuten-/Seitenfräsen | Rainures/contours | Slotting/edge cutting

Fortsetzung | Suite | Continuation



Typ | Type | Typ 01/03/05/06



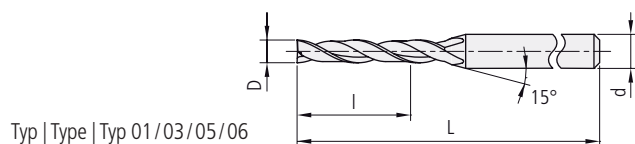
Typ | Type | Typ 02/04

Bezeichnung Désignation Designation	Hartmetall Carbure Carbide				Dimensionen Dimensions Dimensions							Typ Type Typ
	—	○	●	●	D	l	l ₁	d ₁	z	L	d	
MMS...	—	○	●	●	0/-0.01						0/-0.008	
	UHM 10	UHM 10 HX	UHM 20	UHM 20 HX								
MMS 0135 030 201			□	□	1.35	3			2	40	3	01
MMS 0135 080 201			□	□	1.35	8			2	45	4	01
MMS 0135 100 201			□	□	1.35	10			2	45	4	01
MMS 0135 120 201			□	□	1.35	12			2	45	4	01
MMS 0136 030 201			□	□	1.36	3			2	40	3	01
MMS 0137 030 201			■	■	1.37	3			2	40	3	01
MMS 0138 030 201			□	□	1.38	3			2	40	3	01
MMS 0139 030 201			□	□	1.39	3			2	40	3	01
MMS 0140 030 201			□	□	1.4	3			2	40	3	01
MMS 0140 030 401				■	1.4	3			4	60	3	01
MMS 0140 060 201			■	■	1.4	6			2	45	4	01
MMS 0140 060 202			□	□	1.4	2.1	6	1.35	2	50	4	02
MMS 0140 080 201			■	■	1.4	8			2	45	4	01
MMS 0140 100 201			□	□	1.4	10			2	45	4	01
MMS 0140 120 201			■	■	1.4	12			2	45	4	01
MMS 0140 120 202			■	■	1.4	2.1	12	1.35	2	50	4	02
MMS 0140 160 202			□	□	1.4	2.1	16	1.35	2	60	4	02
MMS 0140 200 202			■	■	1.4	2.1	20	1.35	2	60	4	02
MMS 0140 300 202			■	■	1.4	2.1	30	1.35	2	70	4	02
MMS 0141 030 201			□	□	1.41	3			2	40	3	01
MMS 0142 030 201			□	□	1.42	3			2	40	3	01
MMS 0143 030 201			□	□	1.43	3			2	40	3	01
MMS 0144 030 201			□	□	1.44	3			2	40	3	01
MMS 0145 030 201			□	□	1.45	3			2	40	3	01
MMS 0145 080 201			■	■	1.45	8			2	45	4	01
MMS 0145 120 201			□	□	1.45	12			2	45	4	01
MMS 0145 150 201			□	□	1.45	15			2	50	4	01
MMS 0146 030 201			□	□	1.46	3			2	40	3	01
MMS 0147 030 201			□	□	1.47	3			2	40	3	01
MMS 0148 030 201			□	□	1.48	3			2	40	3	01
MMS 0149 030 201			□	□	1.49	3			2	40	3	01
MMS 0150 030 401			■	■	1.5	3			4	60	3	01
MMS 0150 050 201			■	■	1.5	5			2	40	3	01
MMS 0150 050 203	□	□			1.5	5			2	50	4	03
MMS 0150 060 201			■	■	1.5	6			2	45	4	01
MMS 0150 060 204	□	□			1.5	3	6	1.4	2	50	4	04
MMS 0150 080 201			■	■	1.5	8			2	45	4	01
MMS 0150 100 201			■	■	1.5	10			2	45	4	01
MMS 0150 100 202			□	□	1.5	2.3	10	1.45	2	50	4	02
MMS 0150 100 204	□	□			1.5	3	10	1.4	2	50	4	04
MMS 0150 120 201			■	■	1.5	12			2	45	4	01
MMS 0150 120 202			□	□	1.5	2.3	12	1.45	2	50	4	02
MMS 0150 120 204	□	□			1.5	3	12	1.4	2	50	4	04
MMS 0150 150 201			■	■	1.5	15			2	50	4	01
MMS 0150 160 202			■	■	1.5	2.3	16	1.45	2	60	4	02
MMS 0150 160 204	□	□			1.5	3	16	1.4	2	60	4	04
MMS 0150 180 201			□	□	1.5	18			2	55	4	01
MMS 0150 200 201			■	■	1.5	20			2	60	4	01
MMS 0150 200 202			□	□	1.5	2.3	20	1.45	2	60	4	02
MMS 0150 200 204	□	□			1.5	3	20	1.4	2	60	4	04

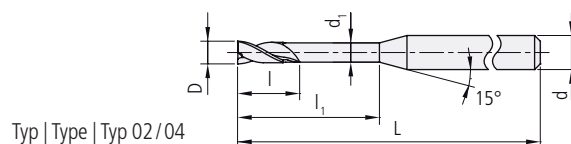
Legende | Légende | Legend □ 4

Nuten-/Seitenfräsen | Rainures/contours | Slotting/edge cutting

Fortsetzung | Suite | Continuation



Typ | Type | Typ 01/03/05/06

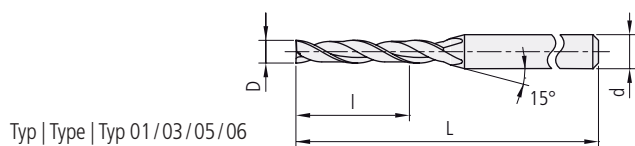


Typ | Type | Typ 02/04

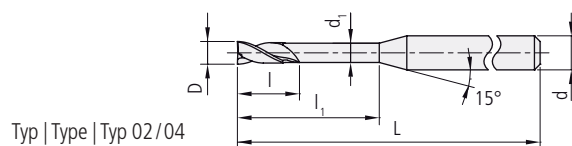
Bezeichnung Désignation Designation	Hartmetall Carbure Carbide				Dimensionen Dimensions Dimensions								Typ Type Typ
					D	l	l ₁	d ₁	z	L	d		
	—	○	●	●									
	—	●	—	●									
MMS...	○	●	—	—	0/-0.01						0/-0.008		
	●	●	—	—									
	... UHM 10	... UHM 10 HX	... UHM 20	... UHM 20 HX									
MMS 0150 250 202			■	■	1.5	2.3	25	1.45	2	70	4		02
MMS 0150 250 204	□	□			1.5	3	25	1.4	2	70	4		04
MMS 0150 300 202			■	■	1.5	2.3	30	1.45	2	70	4		02
MMS 0151 050 201			■	■	1.51	5			2	40	3		01
MMS 0152 050 201			□	□	1.52	5			2	40	3		01
MMS 0153 050 201			□	□	1.53	5			2	40	3		01
MMS 0154 050 201			□	□	1.54	5			2	40	3		01
MMS 0155 050 201			■	■	1.55	5			2	40	3		01
MMS 0155 080 201			□	□	1.55	8			2	45	4		01
MMS 0155 120 201			□	□	1.55	12			2	45	4		01
MMS 0155 160 201			□	□	1.55	16			2	50	4		01
MMS 0156 050 201			□	□	1.56	5			2	40	3		01
MMS 0157 050 201			□	□	1.57	5			2	40	3		01
MMS 0158 050 201			□	□	1.58	5			2	40	3		01
MMS 0159 050 201			□	□	1.59	5			2	40	3		01
MMS 0160 030 401				■	1.6	3			4	60	3		01
MMS 0160 050 201			□	□	1.6	5			2	40	3		01
MMS 0160 080 201			■	■	1.6	8			2	45	4		01
MMS 0160 100 201			□	□	1.6	10			2	45	4		01
MMS 0160 100 202			□	□	1.6	2.4	10	1.55	2	50	4		02
MMS 0160 120 201			□	□	1.6	12			2	45	4		01
MMS 0160 160 201			■	■	1.6	16			2	50	4		01
MMS 0160 160 202			■	■	1.6	2.4	16	1.55	2	60	4		02
MMS 0160 200 202			■	■	1.6	2.4	20	1.55	2	60	4		02
MMS 0160 300 202			■	■	1.6	2.4	30	1.55	2	70	4		02
MMS 0161 050 201			□	□	1.61	5			2	40	3		01
MMS 0162 050 201			□	□	1.62	5			2	40	3		01
MMS 0163 050 201			□	□	1.63	5			2	40	3		01
MMS 0164 050 201			□	□	1.64	5			2	40	3		01
MMS 0165 050 201			□	□	1.65	5			2	40	3		01
MMS 0165 080 201			■	■	1.65	8			2	45	4		01
MMS 0165 120 201			□	□	1.65	12			2	45	4		01
MMS 0165 160 201			□	□	1.65	16			2	50	4		01
MMS 0166 050 201			□	□	1.66	5			2	40	3		01
MMS 0167 050 201			□	□	1.67	5			2	40	3		01
MMS 0168 050 201			□	□	1.68	5			2	40	3		01
MMS 0169 050 201			□	□	1.69	5			2	40	3		01
MMS 0170 030 401				□	1.7	3			4	60	3		01
MMS 0170 050 201			□	□	1.7	5			2	40	3		01
MMS 0170 080 201			□	□	1.7	8			2	45	4		01
MMS 0170 100 201			□	□	1.7	10			2	45	4		01
MMS 0170 100 202			□	□	1.7	2.5	10	1.65	2	50	4		02
MMS 0170 120 201			□	□	1.7	12			2	45	4		01
MMS 0170 160 202			□	□	1.7	2.5	16	1.65	2	60	4		02
MMS 0170 170 201			□	□	1.7	17			2	50	4		01
MMS 0170 200 202			□	□	1.7	2.5	20	1.65	2	60	4		02
MMS 0170 300 202			□	□	1.7	2.5	30	1.65	2	70	4		02
MMS 0171 050 201			□	□	1.71	5			2	40	3		01
MMS 0172 050 201			□	□	1.72	5			2	40	3		01
MMS 0173 050 201			□	□	1.73	5			2	40	3		01

Nuten-/Seitenfräsen | Rainures/contours | Slotting/edge cutting

Fortsetzung | Suite | Continuation



Typ | Type | Typ 01/03/05/06

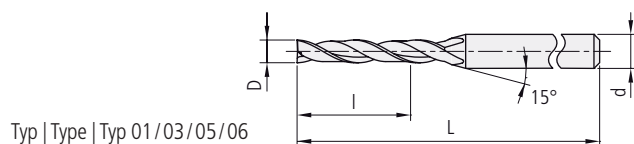


Typ | Type | Typ 02/04

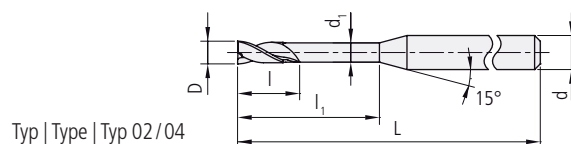
Bezeichnung Désignation Designation	Hartmetall Carbure Carbide				Dimensionen Dimensions Dimensions							Typ Type Typ
	330				D	l	l ₁	d ₁	z	L	d	
MMS...	0/-0.01										0/-0.008	
	UHM 10	UHM 10 HX	UHM 20	UHM 20 HX								
MMS 0174 050 201			□	□	1.74	5			2	40	3	01
MMS 0175 050 201			□	□	1.75	5			2	40	3	01
MMS 0175 100 201			■	■	1.75	10			2	45	4	01
MMS 0175 150 201			□	□	1.75	15			2	50	4	01
MMS 0175 180 201			□	□	1.75	18			2	55	4	01
MMS 0176 050 201			□	□	1.76	5			2	40	3	01
MMS 0177 050 201			□	□	1.77	5			2	40	3	01
MMS 0178 050 201			□	□	1.78	5			2	40	3	01
MMS 0179 050 201			□	□	1.79	5			2	40	3	01
MMS 0180 030 401				■	1.8	3			4	60	3	01
MMS 0180 050 201			■	■	1.8	5			2	40	3	01
MMS 0180 080 201			■	■	1.8	8			2	45	4	01
MMS 0180 100 201			■	■	1.8	10			2	45	4	01
MMS 0180 100 202			□	□	1.8	2.7	10	1.75	2	50	4	02
MMS 0180 120 201			□	□	1.8	12			2	45	4	01
MMS 0180 160 202			■	■	1.8	2.7	16	1.75	2	60	4	02
MMS 0180 180 201			■	■	1.8	18			2	55	4	01
MMS 0180 200 202			■	■	1.8	2.7	20	1.75	2	60	4	02
MMS 0180 300 202			■	■	1.8	2.7	30	1.75	2	70	4	02
MMS 0181 050 201			□	□	1.81	5			2	40	3	01
MMS 0182 050 201			□	□	1.82	5			2	40	3	01
MMS 0183 050 201			□	□	1.83	5			2	40	3	01
MMS 0184 050 201			□	□	1.84	5			2	40	3	01
MMS 0185 050 201			□	□	1.85	5			2	40	3	01
MMS 0185 100 201			□	□	1.85	10			2	45	4	01
MMS 0185 150 201			□	□	1.85	15			2	50	4	01
MMS 0185 180 201			□	□	1.85	18			2	55	4	01
MMS 0186 050 201			□	□	1.86	5			2	40	3	01
MMS 0187 050 201			□	□	1.87	5			2	40	3	01
MMS 0188 050 201			□	□	1.88	5			2	40	3	01
MMS 0189 050 201			□	□	1.89	5			2	40	3	01
MMS 0190 030 401				□	1.9	3			4	60	3	01
MMS 0190 050 201			□	□	1.9	5			2	40	3	01
MMS 0190 080 201			□	□	1.9	8			2	45	4	01
MMS 0190 100 201			□	□	1.9	10			2	45	4	01
MMS 0190 100 202			■	■	1.9	2.8	10	1.85	2	50	4	02
MMS 0190 120 201			□	□	1.9	12			2	45	4	01
MMS 0190 160 202			□	□	1.9	2.8	16	1.85	2	60	4	02
MMS 0190 190 201			□	□	1.9	19			2	55	4	01
MMS 0190 200 202			□	□	1.9	2.8	20	1.85	2	60	4	02
MMS 0190 300 202			□	□	1.9	2.8	30	1.85	2	70	4	02
MMS 0191 050 201			□	□	1.91	5			2	40	3	01
MMS 0192 050 201			□	□	1.92	5			2	40	3	01
MMS 0193 050 201			□	□	1.93	5			2	40	3	01
MMS 0194 050 201			□	□	1.94	5			2	40	3	01
MMS 0195 050 201			□	□	1.95	5			2	40	3	01
MMS 0195 100 201			■	■	1.95	10			2	45	4	01
MMS 0195 150 201			□	□	1.95	15			2	50	4	01
MMS 0195 200 201			□	□	1.95	20			2	60	4	01
MMS 0196 050 201			□	□	1.96	5			2	40	3	01

Nuten-/Seitenfräsen | Rainures/contours | Slotting/edge cutting

Fortsetzung | Suite | Continuation



Typ | Type | Typ 01/03/05/06

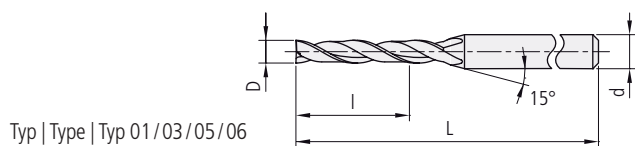


Typ | Type | Typ 02/04

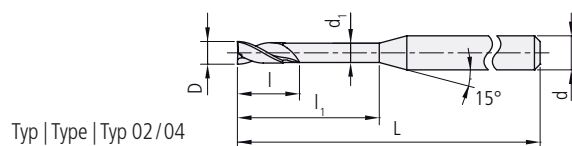
Bezeichnung Désignation Designation	Hartmetall Carbure Carbide				Dimensionen Dimensions Dimensions							Typ Type Typ
	—	○	●	●	D	l	l ₁	d ₁	z	L	d	
MMS...	—	○	●	●	0/-0.01						0/-0.008	
	UHM 10	UHM 10 HX	UHM 20	UHM 20 HX								
MMS 0197 050 201			□	□	1.97	5			2	40	3	01
MMS 0198 050 201			□	□	1.98	5			2	40	3	01
MMS 0199 050 201			□	□	1.99	5			2	40	3	01
MMS 0200 060 201			■	■	2	6			2	40	3	01
MMS 0200 060 203	■	■			2	6			2	50	4	03
MMS 0200 060 401				■	2	6			4	60	3	01
MMS 0200 080 201			■	■	2	8			2	45	4	01
MMS 0200 080 204	□	□			2	4	8	1.9	2	50	4	04
MMS 0200 100 201			■	■	2	10			2	45	4	01
MMS 0200 100 202			□	□	2	3.0	10	1.94	2	50	4	02
MMS 0200 100 204	□	□			2	4	10	1.9	2	50	4	04
MMS 0200 120 201			■	■	2	12			2	45	4	01
MMS 0200 120 202			□	□	2	3.0	12	1.94	2	50	4	02
MMS 0200 120 204	□	□			2	4	12	1.9	2	50	4	04
MMS 0200 140 202			□	□	2	3.0	14	1.94	2	50	4	02
MMS 0200 150 201			■	■	2	15			2	50	4	01
MMS 0200 160 202			□	□	2	3.0	16	1.94	2	60	4	02
MMS 0200 160 204	□	□			2	4	16	1.9	2	60	4	04
MMS 0200 170 201			■	■	2	17			2	55	4	01
MMS 0200 180 202			□	□	2	3.0	18	1.94	2	60	4	02
MMS 0200 200 201			■	■	2	20			2	60	4	01
MMS 0200 200 202			■	■	2	3.0	20	1.94	2	60	4	02
MMS 0200 200 204	■	■			2	4	20	1.9	2	60	4	04
MMS 0200 250 202			■	■	2	3.0	25	1.94	2	70	4	02
MMS 0200 250 204	□	□			2	4	25	1.9	2	70	4	04
MMS 0200 300 202			■	■	2	3.0	30	1.94	2	70	4	02
MMS 0200 300 204	□	□			2	4	30	1.9	2	70	4	04
MMS 0200 350 202			□	□	2	3.0	35	1.94	2	80	4	02
MMS 0200 400 202			■	■	2	3.0	40	1.94	2	80	4	02
MMS 0201 060 201			■	■	2.01	6			2	40	3	01
MMS 0202 060 201			■	■	2.02	6			2	40	3	01
MMS 0203 060 201			■	■	2.03	6			2	40	3	01
MMS 0204 060 201			■	■	2.04	6			2	40	3	01
MMS 0205 060 201			■	■	2.05	6			2	40	3	01
MMS 0206 060 201			□	□	2.06	6			2	40	3	01
MMS 0207 060 201			□	□	2.07	6			2	40	3	01
MMS 0208 060 201			□	□	2.08	6			2	40	3	01
MMS 0209 060 201			□	□	2.09	6			2	40	3	01
MMS 0210 060 201			□	□	2.1	6			2	40	3	01
MMS 0210 060 401				□	2.1	6			4	60	3	01
MMS 0210 100 201			■	■	2.1	10			2	45	4	01
MMS 0210 120 202			■	■	2.1	3.1	12	2.04	2	50	4	02
MMS 0210 150 201			□	□	2.1	15			2	50	4	01
MMS 0210 160 202			□	□	2.1	3.1	16	2.04	2	60	4	02
MMS 0210 200 201			□	□	2.1	20			2	60	4	01
MMS 0210 200 202			□	□	2.1	3.1	20	2.04	2	60	4	02
MMS 0210 300 202			□	□	2.1	3.1	30	2.04	2	70	4	02
MMS 0211 060 201			□	□	2.11	6			2	40	3	01
MMS 0212 060 201			□	□	2.12	6			2	40	3	01
MMS 0213 060 201			□	□	2.13	6			2	40	3	01

Nuten-/Seitenfräsen | Rainures/contours | Slotting/edge cutting

Fortsetzung | Suite | Continuation



Typ | Type | Typ 01/03/05/06

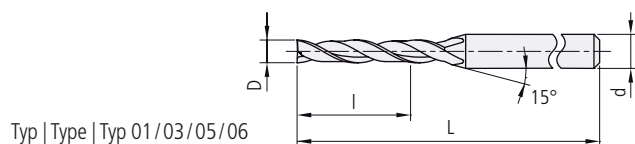


Typ | Type | Typ 02/04

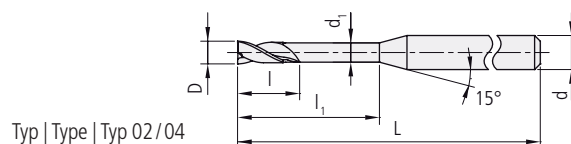
Bezeichnung Désignation Designation	Hartmetall Carbure Carbide				Dimensionen Dimensions Dimensions							Typ Type Typ
	330	330	330	330	D	l	l ₁	d ₁	z	L	d	
MMS...	0/-0.01	0/-0.01	0/-0.01	0/-0.01	0/-0.01	0/-0.01	0/-0.01	0/-0.01	0/-0.01	0/-0.01	0/-0.01	
	UHM 10	UHM 10 HX	UHM 20	UHM 20 HX								
MMS 0214 060 201					2.14	6			2	40	3	01
MMS 0215 060 201					2.15	6			2	40	3	01
MMS 0216 060 201					2.16	6			2	40	3	01
MMS 0217 060 201					2.17	6			2	40	3	01
MMS 0218 060 201					2.18	6			2	40	3	01
MMS 0219 060 201					2.19	6			2	40	3	01
MMS 0220 060 201					2.2	6			2	40	3	01
MMS 0220 060 401					2.2	6			4	60	3	01
MMS 0220 100 201					2.2	10			2	45	4	01
MMS 0220 120 202					2.2	3.3	12	2.14	2	50	4	02
MMS 0220 150 201					2.2	15			2	50	4	01
MMS 0220 160 202					2.2	3.3	16	2.14	2	60	4	02
MMS 0220 200 201					2.2	20			2	60	4	01
MMS 0220 200 202					2.2	3.3	20	2.14	2	60	4	02
MMS 0220 300 202					2.2	3.3	30	2.14	2	70	4	02
MMS 0221 060 201					2.21	6			2	40	3	01
MMS 0222 060 201					2.22	6			2	40	3	01
MMS 0223 060 201					2.23	6			2	40	3	01
MMS 0224 060 201					2.24	6			2	40	3	01
MMS 0225 060 201					2.25	6			2	40	3	01
MMS 0226 060 201					2.26	6			2	40	3	01
MMS 0227 060 201					2.27	6			2	40	3	01
MMS 0228 060 201					2.28	6			2	40	3	01
MMS 0229 060 201					2.29	6			2	40	3	01
MMS 0230 060 201					2.3	6			2	40	3	01
MMS 0230 060 401					2.3	6			4	60	3	01
MMS 0230 100 201					2.3	10			2	45	4	01
MMS 0230 120 202					2.3	3.4	12	2.24	2	50	4	02
MMS 0230 150 201					2.3	15			2	50	4	01
MMS 0230 160 202					2.3	3.4	16	2.24	2	60	4	02
MMS 0230 200 201					2.3	20			2	60	4	01
MMS 0230 200 202					2.3	3.4	20	2.24	2	60	4	02
MMS 0230 300 202					2.3	3.4	30	2.24	2	70	4	02
MMS 0231 060 201					2.31	6			2	40	3	01
MMS 0232 060 201					2.32	6			2	40	3	01
MMS 0233 060 201					2.33	6			2	40	3	01
MMS 0234 060 201					2.34	6			2	40	3	01
MMS 0235 060 201					2.35	6			2	40	3	01
MMS 0236 060 201					2.36	6			2	40	3	01
MMS 0237 060 201					2.37	6			2	40	3	01
MMS 0238 060 201					2.38	6			2	40	3	01
MMS 0239 060 201					2.39	6			2	40	3	01
MMS 0240 060 201					2.4	6			2	40	3	01
MMS 0240 060 401					2.4	6			4	60	3	01
MMS 0240 100 201					2.4	10			2	45	4	01
MMS 0240 120 202					2.4	3.6	12	2.34	2	50	4	02
MMS 0240 150 201					2.4	15			2	50	4	01
MMS 0240 160 202					2.4	3.6	16	2.34	2	60	4	02
MMS 0240 200 201					2.4	20			2	60	4	01
MMS 0240 200 202					2.4	3.6	20	2.34	2	60	4	02

Nuten-/Seitenfräsen | Rainures/contours | Slotting/edge cutting

Fortsetzung | Suite | Continuation



Typ | Type | Typ 01/03/05/06

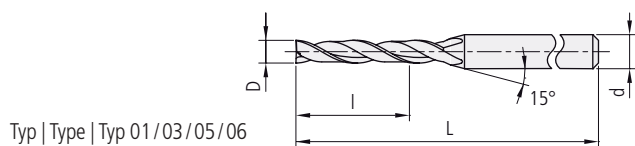


Typ | Type | Typ 02/04

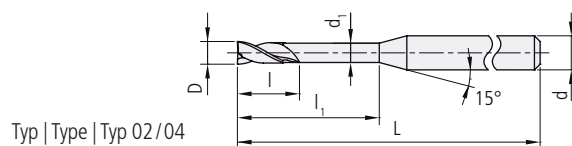
Bezeichnung Désignation Designation	Hartmetall Carbure Carbide				Dimensionen Dimensions Dimensions								Typ Type Typ
	330				D	l	l ₁	d ₁	z	L	d		
	—	○	●	●									
	—	●	—	●									
MMS...	○	●	—	—	0/-0.01						0/-0.008		
	... UHM 10	... UHM 10 HX	... UHM 20	... UHM 20 HX									
MMS 0240 300 202			■	■	2.4	3.6	30	2.34	2	70	4		02
MMS 0241 060 201			□	□	2.41	6			2	40	3		01
MMS 0242 060 201			□	□	2.42	6			2	40	3		01
MMS 0243 060 201			□	□	2.43	6			2	40	3		01
MMS 0244 060 201			□	□	2.44	6			2	40	3		01
MMS 0245 060 201			□	□	2.45	6			2	40	3		01
MMS 0246 060 201			□	□	2.46	6			2	40	3		01
MMS 0247 060 201			□	□	2.47	6			2	40	3		01
MMS 0248 060 201			□	□	2.48	6			2	40	3		01
MMS 0249 060 201			□	□	2.49	6			2	40	3		01
MMS 0250 080 201			■	■	2.5	8			2	40	3		01
MMS 0250 080 203	□	□			2.5	8			2	50	4		03
MMS 0250 080 401				■	2.5	8			4	60	3		01
MMS 0250 100 201			□	□	2.5	10			2	45	4		01
MMS 0250 120 202			□	□	2.5	3.7	12	2.4	2	50	4		02
MMS 0250 150 201			■	■	2.5	15			2	50	4		01
MMS 0250 160 202			□	□	2.5	3.7	16	2.4	2	60	4		02
MMS 0250 200 201			□	□	2.5	20			2	60	4		01
MMS 0250 200 202			■	■	2.5	3.7	20	2.4	2	60	4		02
MMS 0250 250 201			■	■	2.5	25			2	60	4		01
MMS 0250 300 202			■	■	2.5	3.7	30	2.4	2	70	4		02
MMS 0250 400 202			■	■	2.5	3.7	40	2.4	2	80	4		02
MMS 0251 080 201			□	□	2.51	8			2	40	3		01
MMS 0252 080 201			□	□	2.52	8			2	40	3		01
MMS 0253 080 201			□	□	2.53	8			2	40	3		01
MMS 0254 080 201			□	□	2.54	8			2	40	3		01
MMS 0255 080 201			□	□	2.55	8			2	40	3		01
MMS 0256 080 201			□	□	2.56	8			2	40	3		01
MMS 0257 080 201			□	□	2.57	8			2	40	3		01
MMS 0258 080 201			□	□	2.58	8			2	40	3		01
MMS 0259 080 201			□	□	2.59	8			2	40	3		01
MMS 0260 080 201			□	□	2.6	8			2	40	3		01
MMS 0260 080 401				■	2.6	8			4	60	3		01
MMS 0260 100 201			■	■	2.6	10			2	45	4		01
MMS 0260 120 202			□	□	2.6	3.9	12	2.5	2	50	4		02
MMS 0260 150 201			■	■	2.6	15			2	50	4		01
MMS 0260 160 202			□	□	2.6	3.9	16	2.5	2	60	4		02
MMS 0260 200 201			■	■	2.6	20			2	60	4		01
MMS 0260 200 202			■	■	2.6	3.9	20	2.5	2	60	4		02
MMS 0260 250 201			■	■	2.6	25			2	60	4		01
MMS 0260 300 202			■	■	2.6	3.9	30	2.5	2	70	4		02
MMS 0260 400 202			■	■	2.6	3.9	40	2.5	2	80	4		02
MMS 0261 080 201			□	□	2.61	8			2	40	3		01
MMS 0262 080 201			□	□	2.62	8			2	40	3		01
MMS 0263 080 201			□	□	2.63	8			2	40	3		01
MMS 0264 080 201			□	□	2.64	8			2	40	3		01
MMS 0265 080 201			□	□	2.65	8			2	40	3		01
MMS 0266 080 201			□	□	2.66	8			2	40	3		01
MMS 0267 080 201			□	□	2.67	8			2	40	3		01
MMS 0268 080 201			□	□	2.68	8			2	40	3		01

Nuten-/Seitenfräsen | Rainures/contours | Slotting/edge cutting

Fortsetzung | Suite | Continuation



Typ | Type | Typ 01/03/05/06

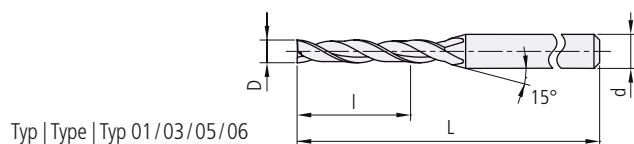


Typ | Type | Typ 02/04

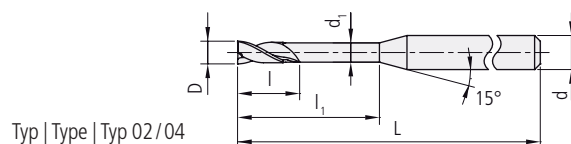
Bezeichnung Désignation Designation	Hartmetall Carbure Carbide				Dimensionen Dimensions Dimensions							Typ Type Typ
	—	○	●	■	D	l	l ₁	d ₁	z	L	d	
MMS...	—	○	●	■	0/-0.01						0/-0.008	
	UHM 10	UHM 10 HX	UHM 20	UHM 20 HX								
MMS 0269 080 201			□	□	2.69	8			2	40	3	01
MMS 0270 080 201			□	□	2.7	8			2	40	3	01
MMS 0270 080 401			□	□	2.7	8			4	60	3	01
MMS 0270 100 201			□	□	2.7	10			2	45	4	01
MMS 0270 120 202			□	□	2.7	4	12	2.6	2	50	4	02
MMS 0270 150 201			□	□	2.7	15			2	50	4	01
MMS 0270 160 202			□	□	2.7	4	16	2.6	2	60	4	02
MMS 0270 200 201			■	■	2.7	20			2	60	4	01
MMS 0270 200 202			□	□	2.7	4	20	2.6	2	60	4	02
MMS 0270 250 201			□	□	2.7	25			2	60	4	01
MMS 0270 300 202			□	□	2.7	4	30	2.6	2	70	4	02
MMS 0270 400 202			□	□	2.7	4	40	2.6	2	80	4	02
MMS 0271 080 201			□	□	2.71	8			2	40	3	01
MMS 0272 080 201			□	□	2.72	8			2	40	3	01
MMS 0273 080 201			□	□	2.73	8			2	40	3	01
MMS 0274 080 201			□	□	2.74	8			2	40	3	01
MMS 0275 080 201			□	□	2.75	8			2	40	3	01
MMS 0276 080 201			■	■	2.76	8			2	40	3	01
MMS 0277 080 201			□	□	2.77	8			2	40	3	01
MMS 0278 080 201			□	□	2.78	8			2	40	3	01
MMS 0279 080 201			□	□	2.79	8			2	40	3	01
MMS 0280 080 201			□	□	2.8	8			2	40	3	01
MMS 0280 080 401			■	■	2.8	8			4	60	3	01
MMS 0280 100 201			□	□	2.8	10			2	45	4	01
MMS 0280 120 202			□	□	2.8	4.2	12	2.7	2	50	4	02
MMS 0280 150 201			■	■	2.8	15			2	50	4	01
MMS 0280 160 202			□	□	2.8	4.2	16	2.7	2	60	4	02
MMS 0280 200 201			■	■	2.8	20			2	60	4	01
MMS 0280 200 202			■	■	2.8	4.2	20	2.7	2	60	4	02
MMS 0280 250 201			■	■	2.8	25			2	60	4	01
MMS 0280 300 202			■	■	2.8	4.2	30	2.7	2	70	4	02
MMS 0280 400 202			■	■	2.8	4.2	40	2.7	2	80	4	02
MMS 0281 080 201			□	□	2.81	8			2	40	3	01
MMS 0282 080 201			□	□	2.82	8			2	40	3	01
MMS 0283 080 201			□	□	2.83	8			2	40	3	01
MMS 0284 080 201			□	□	2.84	8			2	40	3	01
MMS 0285 080 201			□	□	2.85	8			2	40	3	01
MMS 0286 080 201			□	□	2.86	8			2	40	3	01
MMS 0287 080 201			□	□	2.87	8			2	40	3	01
MMS 0288 080 201			□	□	2.88	8			2	40	3	01
MMS 0289 080 201			□	□	2.89	8			2	40	3	01
MMS 0290 080 201			□	□	2.9	8			2	40	3	01
MMS 0290 080 401			□	□	2.9	8			4	60	3	01
MMS 0290 120 202			■	■	2.9	4.3	12	2.8	2	50	4	02
MMS 0290 150 201			□	□	2.9	15			2	50	4	01
MMS 0290 160 202			□	□	2.9	4.3	16	2.8	2	60	4	02
MMS 0290 200 201			■	■	2.9	20			2	60	4	01
MMS 0290 200 202			□	□	2.9	4.3	20	2.8	2	60	4	02
MMS 0290 250 201			□	□	2.9	25			2	60	4	01
MMS 0290 300 202			□	□	2.9	4.3	30	2.8	2	70	4	02

Nuten-/Seitenfräsen | Rainures/contours | Slotting/edge cutting

Fortsetzung | Suite | Continuation



Typ | Type | Typ 01/03/05/06

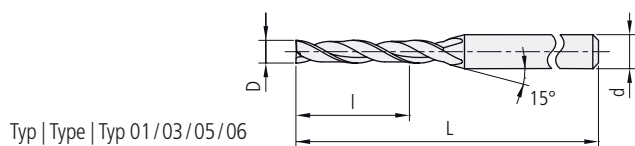


Typ | Type | Typ 02/04

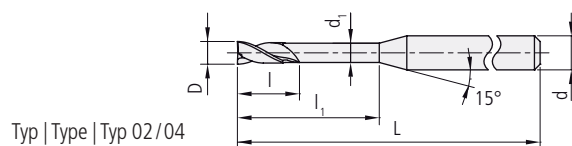
Bezeichnung Désignation Designation	Hartmetall Carbure Carbide				Dimensionen Dimensions Dimensions								Typ Type Typ
	330				D	l	l ₁	d ₁	z	L	d		
	—	○	●	●									
	—	●	—	●									
MMS...	○	●	—	—	0/-0.01						0/-0.008		
	●	●	—	—									
	... UHM 10	... UHM 10 HX	... UHM 20	... UHM 20 HX									
MMS 0290 400 202			□	□	2.9	4.3	40	2.8	2	80	4		02
MMS 0291 080 201			□	□	2.91	8			2	40	3		01
MMS 0292 080 201			□	□	2.92	8			2	40	3		01
MMS 0293 080 201			□	□	2.93	8			2	40	3		01
MMS 0294 080 201			□	□	2.94	8			2	40	3		01
MMS 0295 080 201			□	□	2.95	8			2	40	3		01
MMS 0296 080 201			□	□	2.96	8			2	40	3		01
MMS 0297 080 201			□	□	2.97	8			2	40	3		01
MMS 0298 080 201			□	□	2.98	8			2	40	3		01
MMS 0299 080 201			□	□	2.99	8			2	40	3		01
MMS 0300 080 201			■	■	3	8			2	40	3		01
MMS 0300 080 204	□	□			3	6	8	2.8	2	60	6		04
MMS 0300 080 401				■	3	8			4	60	3		01
MMS 0300 100 201			□	□	3	10			2	50	6		01
MMS 0300 100 203	□	□			3	10			2	60	6		03
MMS 0300 100 205	□	□			3	10			2	80	3		05
MMS 0300 120 202			□	□	3	4.5	12	2.9	2	50	6		02
MMS 0300 120 204	□	□			3	6	12	2.8	2	60	6		04
MMS 0300 150 201			■	■	3	15			2	60	6		01
MMS 0300 160 202			□	□	3	4.5	16	2.9	2	60	6		02
MMS 0300 160 204	■	■			3	6	16	2.8	2	60	6		04
MMS 0300 200 201			■	■	3	20			2	60	6		01
MMS 0300 200 202			□	□	3	4.5	20	2.9	2	60	6		02
MMS 0300 200 204	□	□			3	6	20	2.8	2	60	6		04
MMS 0300 250 201			■	■	3	25			2	70	6		01
MMS 0300 250 202			□	□	3	4.5	25	2.9	2	70	6		02
MMS 0300 250 204	□	□			3	6	25	2.8	2	70	6		04
MMS 0300 300 201			■	■	3	30			2	70	6		01
MMS 0300 300 202			■	■	3	4.5	30	2.9	2	70	6		02
MMS 0300 300 204	□	□			3	6	30	2.8	2	70	6		04
MMS 0300 350 202			□	□	3	4.5	35	2.9	2	80	6		02
MMS 0300 350 204	□	□			3	6	35	2.8	2	80	6		04
MMS 0300 400 202			■	■	3	4.5	40	2.9	2	80	6		02
MMS 0300 400 204	□	□			3	6	40	2.8	2	80	6		04
MMS 0300 450 202			□	□	3	4.5	45	2.9	2	100	6		02
MMS 0300 500 202			■	■	3	4.5	50	2.9	2	100	6		02
MMS 0301 100 201			□	□	3.01	10			2	50	6		01
MMS 0302 100 201			□	□	3.02	10			2	50	6		01
MMS 0303 100 201			□	□	3.03	10			2	50	6		01
MMS 0304 100 201			□	□	3.04	10			2	50	6		01
MMS 0305 100 201			□	□	3.05	10			2	50	6		01
MMS 0306 100 201			□	□	3.06	10			2	50	6		01
MMS 0307 100 201			□	□	3.07	10			2	50	6		01
MMS 0308 100 201			□	□	3.08	10			2	50	6		01
MMS 0309 100 201			□	□	3.09	10			2	50	6		01
MMS 0310 100 201			□	□	3.1	10			2	50	6		01
MMS 0310 200 202			□	□	3.1	4.6	20	3	2	60	6		02
MMS 0310 250 202			□	□	3.1	4.6	25	3	2	70	6		02
MMS 0310 300 201			□	□	3.1	30			2	70	6		01
MMS 0310 300 202			□	□	3.1	4.6	30	3	2	70	6		02

Nuten-/Seitenfräsen | Rainures/contours | Slotting/edge cutting

Fortsetzung | Suite | Continuation



Typ | Type | Typ 01/03/05/06

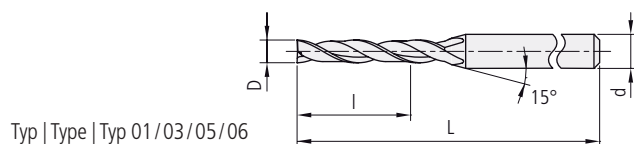


Typ | Type | Typ 02/04

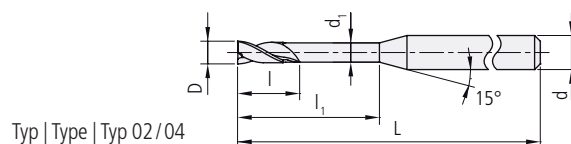
Bezeichnung Désignation Designation	Hartmetall Carbure Carbide				Dimensionen Dimensions Dimensions							Typ Type Typ
	—	○	●	■	D	l	l ₁	d ₁	z	L	d	
MMS...	—	○	●	■	0/-0.01						0/-0.008	
	UHM 10	UHM 10 HX	UHM 20	UHM 20 HX								
MMS 0310 400 202			□	□	3.1	4.6	40	3	2	80	6	02
MMS 0310 500 202			□	□	3.1	4.6	50	3	2	100	6	02
MMS 0311 100 201			□	□	3.11	10			2	50	6	01
MMS 0312 100 201			□	□	3.12	10			2	50	6	01
MMS 0313 100 201			□	□	3.13	10			2	50	6	01
MMS 0314 100 201			■	■	3.14	10			2	50	6	01
MMS 0315 100 201			□	□	3.15	10			2	50	6	01
MMS 0316 100 201			□	□	3.16	10			2	50	6	01
MMS 0317 100 201			□	□	3.17	10			2	50	6	01
MMS 0318 100 201			□	□	3.18	10			2	50	6	01
MMS 0319 100 201			□	□	3.19	10			2	50	6	01
MMS 0320 100 201			□	□	3.2	10			2	50	6	01
MMS 0320 200 202			□	□	3.2	4.8	20	3.1	2	60	6	02
MMS 0320 250 202			□	□	3.2	4.8	25	3.1	2	70	6	02
MMS 0320 300 201			■	■	3.2	30			2	70	6	01
MMS 0320 300 202			□	□	3.2	4.8	30	3.1	2	70	6	02
MMS 0320 400 202			□	□	3.2	4.8	40	3.1	2	80	6	02
MMS 0320 500 202			□	□	3.2	4.8	50	3.1	2	100	6	02
MMS 0321 100 201			□	□	3.21	10			2	50	6	01
MMS 0322 100 201			□	□	3.22	10			2	50	6	01
MMS 0323 100 201			□	□	3.23	10			2	50	6	01
MMS 0324 100 201			□	□	3.24	10			2	50	6	01
MMS 0325 100 201			□	□	3.25	10			2	50	6	01
MMS 0326 100 201			□	□	3.26	10			2	50	6	01
MMS 0327 100 201			□	□	3.27	10			2	50	6	01
MMS 0328 100 201			□	□	3.28	10			2	50	6	01
MMS 0329 100 201			□	□	3.29	10			2	50	6	01
MMS 0330 100 201			□	□	3.3	10			2	50	6	01
MMS 0330 200 202			■	■	3.3	4.9	20	3.2	2	60	6	02
MMS 0330 250 202			□	□	3.3	4.9	25	3.2	2	70	6	02
MMS 0330 300 201			□	□	3.3	30			2	70	6	01
MMS 0330 300 202			□	□	3.3	4.9	30	3.2	2	70	6	02
MMS 0330 400 202			□	□	3.3	4.9	40	3.2	2	80	6	02
MMS 0330 500 202			□	□	3.3	4.9	50	3.2	2	100	6	02
MMS 0331 100 201			□	□	3.31	10			2	50	6	01
MMS 0332 100 201			□	□	3.32	10			2	50	6	01
MMS 0333 100 201			□	□	3.33	10			2	50	6	01
MMS 0334 100 201			□	□	3.34	10			2	50	6	01
MMS 0335 100 201			□	□	3.35	10			2	50	6	01
MMS 0336 100 201			□	□	3.36	10			2	50	6	01
MMS 0337 100 201			□	□	3.37	10			2	50	6	01
MMS 0338 100 201			□	□	3.38	10			2	50	6	01
MMS 0339 100 201			□	□	3.39	10			2	50	6	01
MMS 0340 100 201			□	□	3.4	10			2	50	6	01
MMS 0340 200 202			□	□	3.4	5.1	20	3.3	2	60	6	02
MMS 0340 250 202			□	□	3.4	5.1	25	3.3	2	70	6	02
MMS 0340 300 201			□	□	3.4	30			2	70	6	01
MMS 0340 300 202			□	□	3.4	5.1	30	3.3	2	70	6	02
MMS 0340 400 202			□	□	3.4	5.1	40	3.3	2	80	6	02
MMS 0340 500 202			□	□	3.4	5.1	50	3.3	2	100	6	02

Nuten-/Seitenfräsen | Rainures/contours | Slotting/edge cutting

Fortsetzung | Suite | Continuation



Typ | Type | Typ 01/03/05/06

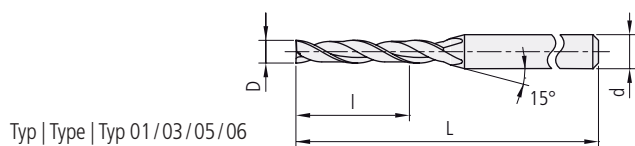


Typ | Type | Typ 02/04

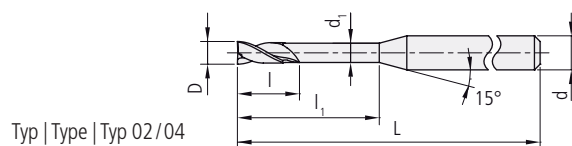
Bezeichnung Désignation Designation	Hartmetall Carbure Carbide				Dimensionen Dimensions Dimensions								Typ Type Typ
	 330				D	l	l ₁	d ₁	z	L	d		
	—	○	●	●									
	—	●	—	●									
MMS...	○	●	—	—	0/-0.01						0/-0.008		
	... UHM 10	... UHM 10 HX	... UHM 20	... UHM 20 HX									
MMS 0341 100 201					3.41	10			2	50	6		01
MMS 0342 100 201					3.42	10			2	50	6		01
MMS 0343 100 201					3.43	10			2	50	6		01
MMS 0344 100 201					3.44	10			2	50	6		01
MMS 0345 100 201					3.45	10			2	50	6		01
MMS 0346 100 201					3.46	10			2	50	6		01
MMS 0347 100 201					3.47	10			2	50	6		01
MMS 0348 100 201					3.48	10			2	50	6		01
MMS 0349 100 201					3.49	10			2	50	6		01
MMS 0350 100 201					3.5	10			2	50	6		01
MMS 0350 200 201					3.5	20			2	70	6		01
MMS 0350 200 202					3.5	5.2	20	3.35	2	60	6		02
MMS 0350 250 201					3.5	25			2	70	6		01
MMS 0350 250 202					3.5	5.2	25	3.35	2	70	6		02
MMS 0350 300 201					3.5	30			2	70	6		01
MMS 0350 300 202					3.5	5.2	30	3.35	2	70	6		02
MMS 0350 400 202					3.5	5.2	40	3.35	2	80	6		02
MMS 0350 500 202					3.5	5.2	50	3.35	2	100	6		02
MMS 0351 100 201					3.51	10			2	50	6		01
MMS 0352 100 201					3.52	10			2	50	6		01
MMS 0353 100 201					3.53	10			2	50	6		01
MMS 0354 100 201					3.54	10			2	50	6		01
MMS 0355 100 201					3.55	10			2	50	6		01
MMS 0356 100 201					3.56	10			2	50	6		01
MMS 0357 100 201					3.57	10			2	50	6		01
MMS 0358 100 201					3.58	10			2	50	6		01
MMS 0359 100 201					3.59	10			2	50	6		01
MMS 0360 100 201					3.6	10			2	50	6		01
MMS 0360 200 202					3.6	5.4	20	3.45	2	60	6		02
MMS 0360 250 202					3.6	5.4	25	3.45	2	70	6		02
MMS 0360 300 201					3.6	30			2	70	6		01
MMS 0360 300 202					3.6	5.4	30	3.45	2	70	6		02
MMS 0360 400 202					3.6	5.4	40	3.45	2	80	6		02
MMS 0360 500 202					3.6	5.4	50	3.45	2	100	6		02
MMS 0361 100 201					3.61	10			2	50	6		01
MMS 0362 100 201					3.62	10			2	50	6		01
MMS 0363 100 201					3.63	10			2	50	6		01
MMS 0364 100 201					3.64	10			2	50	6		01
MMS 0365 100 201					3.65	10			2	50	6		01
MMS 0366 100 201					3.66	10			2	50	6		01
MMS 0367 100 201					3.67	10			2	50	6		01
MMS 0368 100 201					3.68	10			2	50	6		01
MMS 0369 100 201					3.69	10			2	50	6		01
MMS 0370 100 201					3.7	10			2	50	6		01
MMS 0370 200 202					3.7	5.5	20	3.55	2	60	6		02
MMS 0370 250 202					3.7	5.5	25	3.55	2	70	6		02
MMS 0370 300 201					3.7	30			2	70	6		01
MMS 0370 300 202					3.7	5.5	30	3.55	2	70	6		02
MMS 0370 400 202					3.7	5.5	40	3.55	2	80	6		02
MMS 0370 500 202					3.7	5.5	50	3.55	2	100	6		02

Nuten-/Seitenfräsen | Rainures/contours | Slotting/edge cutting

Fortsetzung | Suite | Continuation



Typ | Type | Typ 01/03/05/06



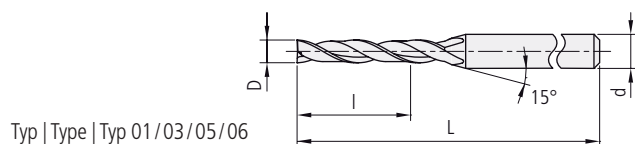
Typ | Type | Typ 02/04

Bezeichnung Désignation Designation	Hartmetall Carbure Carbide				Dimensionen Dimensions Dimensions							Typ Type Typ
	—	○	●	■	D	l	l ₁	d ₁	z	L	d	
MMS...	—	○	●	■	0/-0.01						0/-0.008	
	UHM 10	UHM 10 HX	UHM 20	UHM 20 HX								
MMS 0371 100 201			□	□	3.71	10			2	50	6	01
MMS 0372 100 201			□	□	3.72	10			2	50	6	01
MMS 0373 100 201			□	□	3.73	10			2	50	6	01
MMS 0374 100 201			□	□	3.74	10			2	50	6	01
MMS 0375 100 201			■	■	3.75	10			2	50	6	01
MMS 0376 100 201			□	□	3.76	10			2	50	6	01
MMS 0377 100 201			□	□	3.77	10			2	50	6	01
MMS 0378 100 201			□	□	3.78	10			2	50	6	01
MMS 0379 100 201			□	□	3.79	10			2	50	6	01
MMS 0380 100 201			□	□	3.8	10			2	50	6	01
MMS 0380 200 202			□	□	3.8	5.7	20	3.65	2	60	6	02
MMS 0380 250 202			□	□	3.8	5.7	25	3.65	2	70	6	02
MMS 0380 300 201			□	□	3.8	30			2	70	6	01
MMS 0380 300 202			□	□	3.8	5.7	30	3.65	2	70	6	02
MMS 0380 400 202			□	□	3.8	5.7	40	3.65	2	80	6	02
MMS 0380 500 202			□	□	3.8	5.7	50	3.65	2	100	6	02
MMS 0381 100 201			□	□	3.81	10			2	50	6	01
MMS 0382 100 201			□	□	3.82	10			2	50	6	01
MMS 0383 100 201			□	□	3.83	10			2	50	6	01
MMS 0384 100 201			□	□	3.84	10			2	50	6	01
MMS 0385 100 201			□	□	3.85	10			2	50	6	01
MMS 0386 100 201			□	□	3.86	10			2	50	6	01
MMS 0387 100 201			□	□	3.87	10			2	50	6	01
MMS 0388 100 201			□	□	3.88	10			2	50	6	01
MMS 0389 100 201			□	□	3.89	10			2	50	6	01
MMS 0390 100 201			□	□	3.9	10			2	50	6	01
MMS 0390 200 202			□	□	3.9	5.8	20	3.75	2	60	6	02
MMS 0390 250 202			□	□	3.9	5.8	25	3.75	2	70	6	02
MMS 0390 300 201			□	□	3.9	30			2	70	6	01
MMS 0390 300 202			□	□	3.9	5.8	30	3.75	2	70	6	02
MMS 0390 400 202			□	□	3.9	5.8	40	3.75	2	80	6	02
MMS 0390 500 202			□	□	3.9	5.8	50	3.75	2	100	6	02
MMS 0391 100 201			□	□	3.91	10			2	50	6	01
MMS 0392 100 201			□	□	3.92	10			2	50	6	01
MMS 0393 100 201			□	□	3.93	10			2	50	6	01
MMS 0394 100 201			□	□	3.94	10			2	50	6	01
MMS 0395 100 201			□	□	3.95	10			2	50	6	01
MMS 0396 100 201			□	□	3.96	10			2	50	6	01
MMS 0397 100 201			□	□	3.97	10			2	50	6	01
MMS 0398 100 201			□	□	3.98	10			2	50	6	01
MMS 0399 100 201			□	□	3.99	10			2	50	6	01
MMS 0400 120 201			□	□	4	12			2	50	6	01
MMS 0400 120 203	□	□			4	12			2	60	6	03
MMS 0400 120 205	□	□			4	12			2	80	4	05
MMS 0400 120 204	□	□			4	8	12	3.8	2	60	6	04
MMS 0400 160 204	□	□			4	8	16	3.8	2	60	6	04
MMS 0400 200 201			■	■	4	20			2	70	6	01
MMS 0400 200 202			□	□	4	6	20	3.8	2	60	6	02
MMS 0400 200 204	■	■			4	8	20	3.8	2	60	6	04
MMS 0400 250 201			■	■	4	25			2	70	6	01

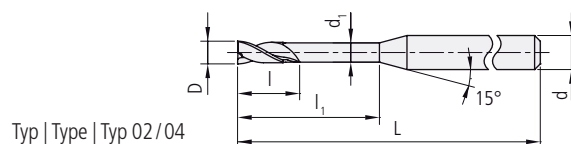
Legende | Légende | Legend □ 4

Nuten-/Seitenfräsen | Rainures/contours | Slotting/edge cutting

Fortsetzung | Suite | Continuation



Typ | Type | Typ 01/03/05/06

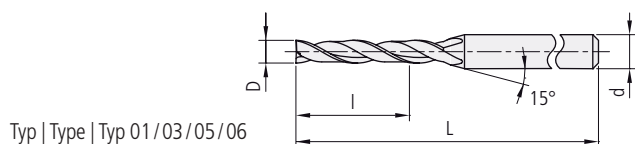


Typ | Type | Typ 02/04

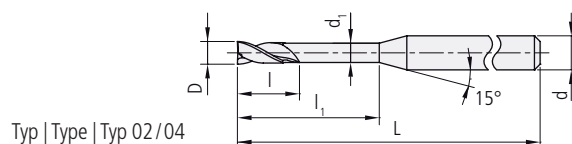
Bezeichnung Désignation Designation	Hartmetall Carbure Carbide				Dimensionen Dimensions Dimensions								Typ Type Typ
					D	l	l ₁	d ₁	z	L	d		
	—	○	●	●									
	—	●	—	●									
MMS...	○	●	—	—	0/-0.01						0/-0.008		
	●	●	—	—									
	... UHM 10	... UHM 10 HX	... UHM 20	... UHM 20 HX									
MMS 0400 250 202			□	□	4	6	25	3.8	2	70	6	02	
MMS 0400 250 204	□	□			4	8	25	3.8	2	70	6	04	
MMS 0400 300 201			■	■	4	30			2	70	6	01	
MMS 0400 300 202			□	□	4	6	30	3.8	2	70	6	02	
MMS 0400 300 204	□	□			4	8	30	3.8	2	70	6	04	
MMS 0400 350 201			■	■	4	35			2	80	6	01	
MMS 0400 350 202			□	□	4	6	35	3.8	2	80	6	02	
MMS 0400 350 204	□	□			4	8	35	3.8	2	80	6	04	
MMS 0400 400 201			■	■	4	40			2	80	6	01	
MMS 0400 400 202			■	■	4	6	40	3.8	2	80	6	02	
MMS 0400 400 204	□	□			4	8	40	3.8	2	80	6	04	
MMS 0400 450 204	□	□			4	8	45	3.8	2	100	6	04	
MMS 0400 500 202			■	■	4	6	50	3.8	2	100	6	02	
MMS 0400 500 204	□	□			4	8	50	3.8	2	100	6	04	
MMS 0400 600 202			■	■	4	6	60	3.8	2	120	6	02	
MMS 0401 120 201			□	□	4.01	12			2	50	6	01	
MMS 0402 120 201			■	■	4.02	12			2	50	6	01	
MMS 0403 120 201			□	□	4.03	12			2	50	6	01	
MMS 0404 120 201			□	□	4.04	12			2	50	6	01	
MMS 0405 120 201			□	□	4.05	12			2	50	6	01	
MMS 0406 120 201			□	□	4.06	12			2	50	6	01	
MMS 0407 120 201			□	□	4.07	12			2	50	6	01	
MMS 0408 120 201			□	□	4.08	12			2	50	6	01	
MMS 0409 120 201			□	□	4.09	12			2	50	6	01	
MMS 0410 120 201			□	□	4.1	12			2	50	6	01	
MMS 0410 200 202			□	□	4.1	6.1	20	3.9	2	60	6	02	
MMS 0410 250 202			□	□	4.1	6.1	25	3.9	2	70	6	02	
MMS 0410 300 201			■	■	4.1	30			2	70	6	01	
MMS 0410 300 202			□	□	4.1	6.1	30	3.9	2	70	6	02	
MMS 0410 400 202			□	□	4.1	6.1	40	3.9	2	80	6	02	
MMS 0410 500 202			□	□	4.1	6.1	50	3.9	2	100	6	02	
MMS 0411 120 201			□	□	4.11	12			2	50	6	01	
MMS 0412 120 201			□	□	4.12	12			2	50	6	01	
MMS 0413 120 201			□	□	4.13	12			2	50	6	01	
MMS 0414 120 201			□	□	4.14	12			2	50	6	01	
MMS 0415 120 201			□	□	4.15	12			2	50	6	01	
MMS 0416 120 201			□	□	4.16	12			2	50	6	01	
MMS 0417 120 201			□	□	4.17	12			2	50	6	01	
MMS 0418 120 201			□	□	4.18	12			2	50	6	01	
MMS 0419 120 201			□	□	4.19	12			2	50	6	01	
MMS 0420 120 201			□	□	4.2	12			2	50	6	01	
MMS 0420 200 202			■	■	4.2	6.3	20	4	2	60	6	02	
MMS 0420 250 202			□	□	4.2	6.3	25	4	2	70	6	02	
MMS 0420 300 201			□	□	4.2	30			2	70	6	01	
MMS 0420 300 202			□	□	4.2	6.3	30	4	2	70	6	02	
MMS 0420 400 202			□	□	4.2	6.3	40	4	2	80	6	02	
MMS 0420 500 202			□	□	4.2	6.3	50	4	2	100	6	02	
MMS 0421 120 201			□	□	4.21	12			2	50	6	01	
MMS 0422 120 201			□	□	4.22	12			2	50	6	01	
MMS 0423 120 201			□	□	4.23	12			2	50	6	01	

Nuten-/Seitenfräsen | Rainures/contours | Slotting/edge cutting

Fortsetzung | Suite | Continuation



Typ | Type | Typ 01/03/05/06

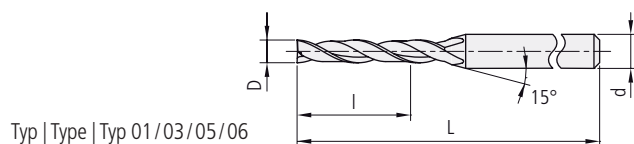


Typ | Type | Typ 02/04

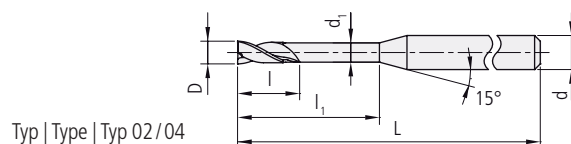
Bezeichnung Désignation Designation	Hartmetall Carbure Carbide				Dimensionen Dimensions Dimensions							Typ Type Typ
	330				D	l	l ₁	d ₁	z	L	d	
MMS...					0/-0.01						0/-0.008	
	UHM 10	UHM 10 HX	UHM 20	UHM 20 HX								
MMS 0424 120 201			□	□	4.24	12			2	50	6	01
MMS 0425 120 201			□	□	4.25	12			2	50	6	01
MMS 0426 120 201			□	□	4.26	12			2	50	6	01
MMS 0427 120 201			□	□	4.27	12			2	50	6	01
MMS 0428 120 201			□	□	4.28	12			2	50	6	01
MMS 0429 120 201			□	□	4.29	12			2	50	6	01
MMS 0430 120 201			□	□	4.3	12			2	50	6	01
MMS 0430 200 202			□	□	4.3	6.4	20	4.1	2	60	6	02
MMS 0430 250 202			□	□	4.3	6.4	25	4.1	2	70	6	02
MMS 0430 300 201			□	□	4.3	30			2	70	6	01
MMS 0430 300 202			□	□	4.3	6.4	30	4.1	2	70	6	02
MMS 0430 400 202			□	□	4.3	6.4	40	4.1	2	80	6	02
MMS 0430 500 202			□	□	4.3	6.4	50	4.1	2	100	6	02
MMS 0431 120 201			□	□	4.31	12			2	50	6	01
MMS 0432 120 201			□	□	4.32	12			2	50	6	01
MMS 0433 120 201			□	□	4.33	12			2	50	6	01
MMS 0434 120 201			□	□	4.34	12			2	50	6	01
MMS 0435 120 201			□	□	4.35	12			2	50	6	01
MMS 0436 120 201			□	□	4.36	12			2	50	6	01
MMS 0437 120 201			□	□	4.37	12			2	50	6	01
MMS 0438 120 201			□	□	4.38	12			2	50	6	01
MMS 0439 120 201			□	□	4.39	12			2	50	6	01
MMS 0440 120 201			□	□	4.4	12			2	50	6	01
MMS 0440 200 202			□	□	4.4	6.6	20	4.2	2	60	6	02
MMS 0440 250 202			□	□	4.4	6.6	25	4.2	2	70	6	02
MMS 0440 300 201			□	□	4.4	30			2	70	6	01
MMS 0440 300 202			□	□	4.4	6.6	30	4.2	2	70	6	02
MMS 0440 400 202			□	□	4.4	6.6	40	4.2	2	80	6	02
MMS 0440 500 202			□	□	4.4	6.6	50	4.2	2	100	6	02
MMS 0441 120 201			□	□	4.41	12			2	50	6	01
MMS 0442 120 201			□	□	4.42	12			2	50	6	01
MMS 0443 120 201			□	□	4.43	12			2	50	6	01
MMS 0444 120 201			□	□	4.44	12			2	50	6	01
MMS 0445 120 201			□	□	4.45	12			2	50	6	01
MMS 0446 120 201			□	□	4.46	12			2	50	6	01
MMS 0447 120 201			□	□	4.47	12			2	50	6	01
MMS 0448 120 201			□	□	4.48	12			2	50	6	01
MMS 0449 120 201			□	□	4.49	12			2	50	6	01
MMS 0450 120 201			□	□	4.5	12			2	50	6	01
MMS 0450 200 202			□	□	4.5	6.7	20	4.3	2	60	6	02
MMS 0450 250 202			□	□	4.5	6.7	25	4.3	2	70	6	02
MMS 0450 300 201			■	■	4.5	30			2	70	6	01
MMS 0450 300 202			□	□	4.5	6.7	30	4.3	2	70	6	02
MMS 0450 350 201			□	□	4.5	35			2	80	6	01
MMS 0450 400 201			■	■	4.5	40			2	80	6	01
MMS 0450 400 202			■	■	4.5	6.7	40	4.3	2	80	6	02
MMS 0450 500 202			■	■	4.5	6.7	50	4.3	2	100	6	02
MMS 0451 120 201			□	□	4.51	12			2	50	6	01
MMS 0452 120 201			□	□	4.52	12			2	50	6	01
MMS 0453 120 201			□	□	4.53	12			2	50	6	01

Nuten-/Seitenfräsen | Rainures/contours | Slotting/edge cutting

Fortsetzung | Suite | Continuation



Typ | Type | Typ 01/03/05/06

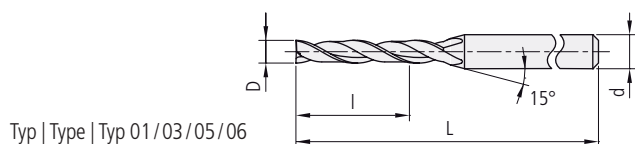


Typ | Type | Typ 02/04

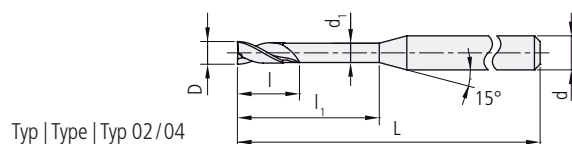
Bezeichnung Désignation Designation	Hartmetall Carbure Carbide				Dimensionen Dimensions Dimensions							Typ Type Typ
	330	330	330	330	D	l	l ₁	d ₁	z	L	d	
MMS...	330	330	330	330	0/-0.01						0/-0.008	
	UHM 10	UHM 10 HX	UHM 20	UHM 20 HX								
MMS 0454 120 201					4.54	12			2	50	6	01
MMS 0455 120 201					4.55	12			2	50	6	01
MMS 0456 120 201					4.56	12			2	50	6	01
MMS 0457 120 201					4.57	12			2	50	6	01
MMS 0458 120 201					4.58	12			2	50	6	01
MMS 0459 120 201					4.59	12			2	50	6	01
MMS 0460 120 201					4.6	12			2	50	6	01
MMS 0460 200 202					4.6	6.9	20	4.4	2	60	6	02
MMS 0460 250 202					4.6	6.9	25	4.4	2	70	6	02
MMS 0460 300 201					4.6	30			2	70	6	01
MMS 0460 300 202					4.6	6.9	30	4.4	2	70	6	02
MMS 0460 400 202					4.6	6.9	40	4.4	2	80	6	02
MMS 0460 500 202					4.6	6.9	50	4.4	2	100	6	02
MMS 0461 120 201					4.61	12			2	50	6	01
MMS 0462 120 201					4.62	12			2	50	6	01
MMS 0463 120 201					4.63	12			2	50	6	01
MMS 0464 120 201					4.64	12			2	50	6	01
MMS 0465 120 201					4.65	12			2	50	6	01
MMS 0466 120 201					4.66	12			2	50	6	01
MMS 0467 120 201					4.67	12			2	50	6	01
MMS 0468 120 201					4.68	12			2	50	6	01
MMS 0469 120 201					4.69	12			2	50	6	01
MMS 0470 120 201					4.7	12			2	50	6	01
MMS 0470 200 202					4.7	7	20	4.5	2	60	6	02
MMS 0470 250 202					4.7	7	25	4.5	2	70	6	02
MMS 0470 300 201					4.7	30			2	70	6	01
MMS 0470 300 202					4.7	7	30	4.5	2	70	6	02
MMS 0470 400 202					4.7	7	40	4.5	2	80	6	02
MMS 0470 500 202					4.7	7	50	4.5	2	100	6	02
MMS 0471 120 201					4.71	12			2	50	6	01
MMS 0472 120 201					4.72	12			2	50	6	01
MMS 0473 120 201					4.73	12			2	50	6	01
MMS 0474 120 201					4.74	12			2	50	6	01
MMS 0475 120 201					4.75	12			2	50	6	01
MMS 0476 120 201					4.76	12			2	50	6	01
MMS 0477 120 201					4.77	12			2	50	6	01
MMS 0478 120 201					4.78	12			2	50	6	01
MMS 0479 120 201					4.79	12			2	50	6	01
MMS 0480 120 201					4.8	12			2	50	6	01
MMS 0480 200 202					4.8	7.2	20	4.6	2	60	6	02
MMS 0480 250 202					4.8	7.2	25	4.6	2	70	6	02
MMS 0480 300 201					4.8	30			2	70	6	01
MMS 0480 300 202					4.8	7.2	30	4.6	2	70	6	02
MMS 0480 400 202					4.8	7.2	40	4.6	2	80	6	02
MMS 0480 500 202					4.8	7.2	50	4.6	2	100	6	02
MMS 0481 120 201					4.81	12			2	50	6	01
MMS 0482 120 201					4.82	12			2	50	6	01
MMS 0483 120 201					4.83	12			2	50	6	01
MMS 0484 120 201					4.84	12			2	50	6	01
MMS 0485 120 201					4.85	12			2	50	6	01

Nuten-/Seitenfräsen | Rainures/contours | Slotting/edge cutting

Fortsetzung | Suite | Continuation



Typ | Type | Typ 01/03/05/06

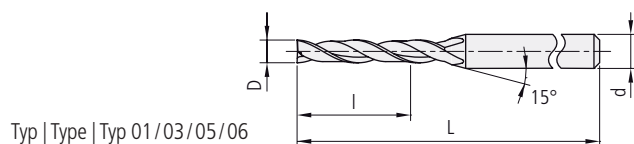


Typ | Type | Typ 02/04

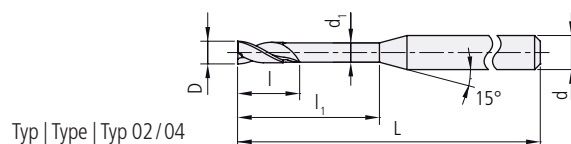
Bezeichnung Désignation Designation	Hartmetall Carbure Carbide				Dimensionen Dimensions Dimensions							Typ Type Typ
	—	○	●	●	D	l	l ₁	d ₁	z	L	d	
MMS...	—	○	●	●	0/-0.01						0/-0.008	
	UHM 10	UHM 10 HX	UHM 20	UHM 20 HX								
MMS 0486 120 201			□	□	4.86	12			2	50	6	01
MMS 0487 120 201			□	□	4.87	12			2	50	6	01
MMS 0488 120 201			□	□	4.88	12			2	50	6	01
MMS 0489 120 201			□	□	4.89	12			2	50	6	01
MMS 0490 120 201			□	□	4.9	12			2	50	6	01
MMS 0490 200 202			□	□	4.9	7.3	20	4.7	2	60	6	02
MMS 0490 250 202			□	□	4.9	7.3	25	4.7	2	70	6	02
MMS 0490 300 201			□	□	4.9	30			2	70	6	01
MMS 0490 300 202			□	□	4.9	7.3	30	4.7	2	70	6	02
MMS 0490 400 202			□	□	4.9	7.3	40	4.7	2	80	6	02
MMS 0490 500 202			□	□	4.9	7.3	50	4.7	2	100	6	02
MMS 0491 120 201			□	□	4.91	12			2	50	6	01
MMS 0492 120 201			□	□	4.92	12			2	50	6	01
MMS 0493 120 201			□	□	4.93	12			2	50	6	01
MMS 0494 120 201			□	□	4.94	12			2	50	6	01
MMS 0495 120 201			□	□	4.95	12			2	50	6	01
MMS 0496 120 201			□	□	4.96	12			2	50	6	01
MMS 0497 120 201			□	□	4.97	12			2	50	6	01
MMS 0498 120 201			□	□	4.98	12			2	50	6	01
MMS 0499 120 201			□	□	4.99	12			2	50	6	01
MMS 0500 150 201			□	□	5	15			2	50	6	01
MMS 0500 150 203	□	□			5	15			2	60	6	03
MMS 0500 160 204	□	□			5	10	16	4.8	2	60	6	04
MMS 0500 200 202			□	□	5	7.5	20	4.8	2	60	6	02
MMS 0500 200 204	□	□			5	10	20	4.8	2	60	6	04
MMS 0500 250 202			□	□	5	7.5	25	4.8	2	70	6	02
MMS 0500 300 201			■	■	5	30			2	70	6	01
MMS 0500 300 202			□	□	5	7.5	30	4.8	2	70	6	02
MMS 0500 300 204	□	□			5	10	30	4.8	2	70	6	04
MMS 0500 350 201			□	□	5	35			2	80	6	01
MMS 0500 350 202			□	□	5	7.5	35	4.8	2	80	6	02
MMS 0500 400 201			□	□	5	40			2	80	6	01
MMS 0500 400 202			□	□	5	7.5	40	4.8	2	80	6	02
MMS 0500 400 204	□	□			5	10	40	4.8	2	80	6	04
MMS 0500 450 201			□	□	5	45			2	90	6	01
MMS 0500 500 201			■	■	5	50			2	90	6	01
MMS 0500 500 202			■	■	5	7.5	50	4.8	2	100	6	02
MMS 0500 500 204	□	□			5	10	50	4.8	2	100	6	04
MMS 0500 600 202			■	■	5	7.5	60	4.8	2	120	6	02
MMS 0501 150 201			□	□	5.01	15			2	50	6	01
MMS 0502 150 201			□	□	5.02	15			2	50	6	01
MMS 0503 150 201			□	□	5.03	15			2	50	6	01
MMS 0504 150 201			□	□	5.04	15			2	50	6	01
MMS 0505 150 201			□	□	5.05	15			2	50	6	01
MMS 0506 150 201			□	□	5.06	15			2	50	6	01
MMS 0507 150 201			□	□	5.07	15			2	50	6	01
MMS 0508 150 201			□	□	5.08	15			2	50	6	01
MMS 0509 150 201			□	□	5.09	15			2	50	6	01
MMS 0510 150 201			□	□	5.1	15			2	50	6	01
MMS 0510 200 202			□	□	5.1	7.6	20	4.9	2	60	6	02

Nuten-/Seitenfräsen | Rainures/contours | Slotting/edge cutting

Fortsetzung | Suite | Continuation



Typ | Type | Typ 01/03/05/06

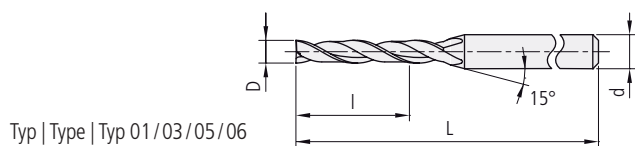


Typ | Type | Typ 02/04

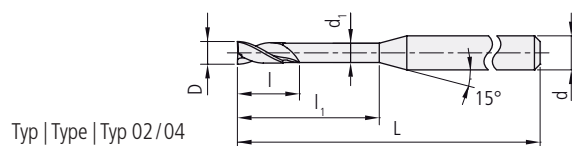
Bezeichnung Désignation Designation	Hartmetall Carbure Carbide				Dimensionen Dimensions Dimensions							Typ Type Typ
	—	○	●	■	D	l	l ₁	d ₁	z	L	d	
MMS...	—	○	●	■	0/-0.01						0/-0.008	
	UHM 10	UHM 10 HX	UHM 20	UHM 20 HX								
MMS 0510 300 202			□	□	5.1	7.6	30	4.9	2	70	6	02
MMS 0510 400 201			□	□	5.1	40			2	80	6	01
MMS 0510 400 202			□	□	5.1	7.6	40	4.9	2	80	6	02
MMS 0510 500 202			□	□	5.1	7.6	50	4.9	2	100	6	02
MMS 0510 600 202			□	□	5.1	7.6	60	4.9	2	120	6	02
MMS 0511 150 201			□	□	5.11	15			2	50	6	01
MMS 0512 150 201			□	□	5.12	15			2	50	6	01
MMS 0513 150 201			□	□	5.13	15			2	50	6	01
MMS 0514 150 201			□	□	5.14	15			2	50	6	01
MMS 0515 150 201			□	□	5.15	15			2	50	6	01
MMS 0516 150 201			□	□	5.16	15			2	50	6	01
MMS 0517 150 201			□	□	5.17	15			2	50	6	01
MMS 0518 150 201			□	□	5.18	15			2	50	6	01
MMS 0519 150 201			□	□	5.19	15			2	50	6	01
MMS 0520 150 201			□	□	5.2	15			2	50	6	01
MMS 0520 200 202			□	□	5.2	7.8	20	5	2	60	6	02
MMS 0520 300 202			□	□	5.2	7.8	30	5	2	70	6	02
MMS 0520 400 201			□	□	5.2	40			2	80	6	01
MMS 0520 400 202			□	□	5.2	7.8	40	5	2	80	6	02
MMS 0520 500 202			□	□	5.2	7.8	50	5	2	100	6	02
MMS 0520 600 202			□	□	5.2	7.8	60	5	2	120	6	02
MMS 0521 150 201			□	□	5.21	15			2	50	6	01
MMS 0522 150 201			□	□	5.22	15			2	50	6	01
MMS 0523 150 201			□	□	5.23	15			2	50	6	01
MMS 0524 150 201			□	□	5.24	15			2	50	6	01
MMS 0525 150 201			□	□	5.25	15			2	50	6	01
MMS 0526 150 201			□	□	5.26	15			2	50	6	01
MMS 0527 150 201			□	□	5.27	15			2	50	6	01
MMS 0528 150 201			□	□	5.28	15			2	50	6	01
MMS 0529 150 201			□	□	5.29	15			2	50	6	01
MMS 0530 150 201			□	□	5.3	15			2	50	6	01
MMS 0530 200 202			□	□	5.3	7.9	20	5.1	2	60	6	02
MMS 0530 300 202			□	□	5.3	7.9	30	5.1	2	70	6	02
MMS 0530 400 201			□	□	5.3	40			2	80	6	01
MMS 0530 400 202			□	□	5.3	7.9	40	5.1	2	80	6	02
MMS 0530 500 202			□	□	5.3	7.9	50	5.1	2	100	6	02
MMS 0530 600 202			□	□	5.3	7.9	60	5.1	2	120	6	02
MMS 0531 150 201			□	□	5.31	15			2	50	6	01
MMS 0532 150 201			□	□	5.32	15			2	50	6	01
MMS 0533 150 201			□	□	5.33	15			2	50	6	01
MMS 0534 150 201			□	□	5.34	15			2	50	6	01
MMS 0535 150 201			□	□	5.35	15			2	50	6	01
MMS 0536 150 201			□	□	5.36	15			2	50	6	01
MMS 0537 150 201			□	□	5.37	15			2	50	6	01
MMS 0538 150 201			□	□	5.38	15			2	50	6	01
MMS 0539 150 201			□	□	5.39	15			2	50	6	01
MMS 0540 150 201			□	□	5.4	15			2	50	6	01
MMS 0540 200 202			□	□	5.4	8.1	20	5.2	2	60	6	02
MMS 0540 300 202			□	□	5.4	8.1	30	5.2	2	70	6	02
MMS 0540 400 201			□	□	5.4	40			2	80	6	01

Nuten-/Seitenfräsen | Rainures/contours | Slotting/edge cutting

Fortsetzung | Suite | Continuation



Typ | Type | Typ 01/03/05/06

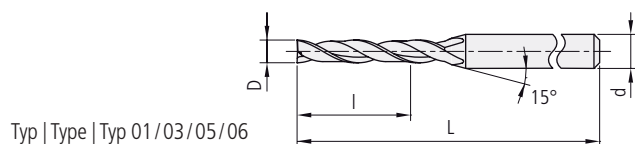


Typ | Type | Typ 02/04

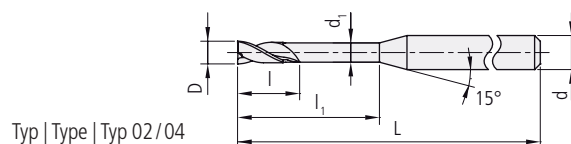
Bezeichnung Désignation Designation	Hartmetall Carbure Carbide				Dimensionen Dimensions Dimensions							Typ Type Typ
	—	○	●	■	D	l	l ₁	d ₁	z	L	d	
MMS...	—	○	●	■	0/-0.01						0/-0.008	
	UHM 10	UHM 10 HX	UHM 20	UHM 20 HX								
MMS 0540 400 202			□	□	5.4	8.1	40	5.2	2	80	6	02
MMS 0540 500 202			□	□	5.4	8.1	50	5.2	2	100	6	02
MMS 0540 600 202			□	□	5.4	8.1	60	5.2	2	120	6	02
MMS 0541 150 201			□	□	5.41	15			2	50	6	01
MMS 0542 150 201			□	□	5.42	15			2	50	6	01
MMS 0543 150 201			□	□	5.43	15			2	50	6	01
MMS 0544 150 201			□	□	5.44	15			2	50	6	01
MMS 0545 150 201			□	□	5.45	15			2	50	6	01
MMS 0546 150 201			□	□	5.46	15			2	50	6	01
MMS 0547 150 201			□	□	5.47	15			2	50	6	01
MMS 0548 150 201			□	□	5.48	15			2	50	6	01
MMS 0549 150 201			□	□	5.49	15			2	50	6	01
MMS 0550 150 201			□	□	5.5	15			2	50	6	01
MMS 0550 200 202			□	□	5.5	8.2	20	5.3	2	60	6	02
MMS 0550 300 201			■	■	5.5	30			2	80	6	01
MMS 0550 300 202			□	□	5.5	8.2	30	5.3	2	70	6	02
MMS 0550 350 201			□	□	5.5	35			2	80	6	01
MMS 0550 400 201			□	□	5.5	40			2	80	6	01
MMS 0550 400 202			□	□	5.5	8.2	40	5.3	2	80	6	02
MMS 0550 450 201			□	□	5.5	45			2	90	6	01
MMS 0550 500 201			■	■	5.5	50			2	90	6	01
MMS 0550 500 202			■	■	5.5	8.2	50	5.3	2	100	6	02
MMS 0550 600 202			■	■	5.5	8.2	60	5.3	2	120	6	02
MMS 0551 150 201			□	□	5.51	15			2	50	6	01
MMS 0552 150 201			□	□	5.52	15			2	50	6	01
MMS 0553 150 201			□	□	5.53	15			2	50	6	01
MMS 0554 150 201			□	□	5.54	15			2	50	6	01
MMS 0555 150 201			□	□	5.55	15			2	50	6	01
MMS 0556 150 201			□	□	5.56	15			2	50	6	01
MMS 0557 150 201			□	□	5.57	15			2	50	6	01
MMS 0558 150 201			□	□	5.58	15			2	50	6	01
MMS 0559 150 201			□	□	5.59	15			2	50	6	01
MMS 0560 200 202			□	□	5.6	8.4	20	5.4	2	60	6	02
MMS 0560 300 202			□	□	5.6	8.4	30	5.4	2	70	6	02
MMS 0560 400 201			□	□	5.6	40			2	6	6	01
MMS 0560 400 202			□	□	5.6	8.4	40	5.4	2	80	6	02
MMS 0560 500 202			□	□	5.6	8.4	50	5.4	2	100	6	02
MMS 0560 600 202			□	□	5.6	8.4	60	5.4	2	120	6	02
MMS 0561 150 201			□	□	5.61	15			2	50	6	01
MMS 0562 150 201			□	□	5.62	15			2	50	6	01
MMS 0563 150 201			□	□	5.63	15			2	50	6	01
MMS 0564 150 201			□	□	5.64	15			2	50	6	01
MMS 0565 150 201			□	□	5.65	15			2	50	6	01
MMS 0566 150 201			□	□	5.66	15			2	50	6	01
MMS 0567 150 201			□	□	5.67	15			2	50	6	01
MMS 0568 150 201			□	□	5.68	15			2	50	6	01
MMS 0569 150 201			□	□	5.69	15			2	50	6	01
MMS 0570 150 201			□	□	5.7	15			2	50	6	01
MMS 0570 200 202			□	□	5.7	8.5	20	5.5	2	60	6	02
MMS 0570 300 202			□	□	5.7	8.5	30	5.5	2	70	6	02
MMS 0570 400 201			□	□	5.7	40			2	80	6	01

Nuten-/Seitenfräsen | Rainures/contours | Slotting/edge cutting

Fortsetzung | Suite | Continuation



Typ | Type | Typ 01/03/05/06

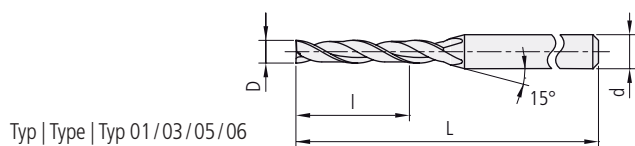


Typ | Type | Typ 02/04

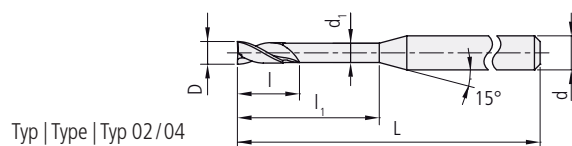
Bezeichnung Désignation Designation	Hartmetall Carbure Carbide				Dimensionen Dimensions Dimensions							Typ Type Typ
	—	○	●	■	D	l	l ₁	d ₁	z	L	d	
MMS...	—	○	●	■	0/-0.01						0/-0.008	
	...	UHM 10	...	UHM 20								
MMS 0570 400 202			□	□	5.7	8.5	40	5.5	2	80	6	02
MMS 0570 500 202			□	□	5.7	8.5	50	5.5	2	100	6	02
MMS 0570 600 202			□	□	5.7	8.5	60	5.5	2	120	6	02
MMS 0571 150 201			□	□	5.71	15			2	50	6	01
MMS 0572 150 201			□	□	5.72	15			2	50	6	01
MMS 0573 150 201			□	□	5.73	15			2	50	6	01
MMS 0574 150 201			□	□	5.74	15			2	50	6	01
MMS 0575 150 201			□	□	5.75	15			2	50	6	01
MMS 0576 150 201			□	□	5.76	15			2	50	6	01
MMS 0577 150 201			□	□	5.77	15			2	50	6	01
MMS 0578 150 201			□	□	5.78	15			2	50	6	01
MMS 0579 150 201			□	□	5.79	15			2	50	6	01
MMS 0580 150 201			□	□	5.8	15			2	50	6	01
MMS 0580 200 202			□	□	5.8	8.7	20	5.6	2	60	6	02
MMS 0580 300 202			□	□	5.8	8.7	30	5.6	2	70	6	02
MMS 0580 400 201			□	□	5.8	40			2	80	6	01
MMS 0580 400 202			□	□	5.8	8.7	40	5.6	2	80	6	02
MMS 0580 500 202			□	□	5.8	8.7	50	5.6	2	100	6	02
MMS 0580 600 202			□	□	5.8	8.7	60	5.6	2	120	6	02
MMS 0581 150 201			□	□	5.81	15			2	50	6	01
MMS 0582 150 201			□	□	5.82	15			2	50	6	01
MMS 0583 150 201			□	□	5.83	15			2	50	6	01
MMS 0584 150 201			□	□	5.84	15			2	50	6	01
MMS 0585 150 201			□	□	5.85	15			2	50	6	01
MMS 0586 150 201			□	□	5.86	15			2	50	6	01
MMS 0587 150 201			□	□	5.87	15			2	50	6	01
MMS 0588 150 201			□	□	5.88	15			2	50	6	01
MMS 0589 150 201			□	□	5.89	15			2	50	6	01
MMS 0590 150 201			□	□	5.9	15			2	50	6	01
MMS 0590 200 202			□	□	5.9	8.8	20	5.7	2	60	6	02
MMS 0590 300 202			□	□	5.9	8.8	30	5.7	2	70	6	02
MMS 0590 400 201			□	□	5.9	40			2	80	6	01
MMS 0590 400 202			□	□	5.9	8.8	40	5.7	2	80	6	02
MMS 0590 500 202			□	□	5.9	8.8	50	5.7	2	100	6	02
MMS 0590 600 202			□	□	5.9	8.8	60	5.7	2	120	6	02
MMS 0591 150 201			□	□	5.91	15			2	50	6	01
MMS 0592 150 201			□	□	5.92	15			2	50	6	01
MMS 0593 150 201			□	□	5.93	15			2	50	6	01
MMS 0594 150 201			□	□	5.94	15			2	50	6	01
MMS 0595 150 201			□	□	5.95	15			2	50	6	01
MMS 0596 150 201			□	□	5.96	15			2	50	6	01
MMS 0597 150 201			□	□	5.97	15			2	50	6	01
MMS 0598 150 201			□	□	5.98	15			2	50	6	01
MMS 0599 150 201			□	□	5.99	15			2	50	6	01
MMS 0600 150 201			□	□	6	15			2	50	6	01
MMS 0600 150 203	□	□			6	15			2	60	6	03
MMS 0600 200 202			□	□	6	9	20	5.8	2	60	6	02
MMS 0600 210 203	□	□			6	21			2	100	6	03
MMS 0600 300 201			■	■	6	30			2	80	6	01
MMS 0600 300 202			□	□	6	9	30	5.8	2	70	6	02
MMS 0600 350 201			■	■	6	35			2	80	6	01
MMS 0600 400 201			■	■	6	40			2	80	6	01

Nuten-/Seitenfräsen | Rainures/contours | Slotting/edge cutting

Fortsetzung | Suite | Continuation



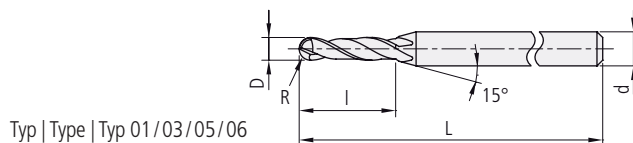
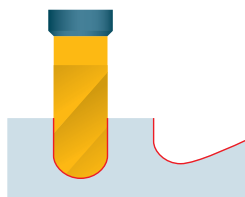
Typ | Type | Typ 01/03/05/06



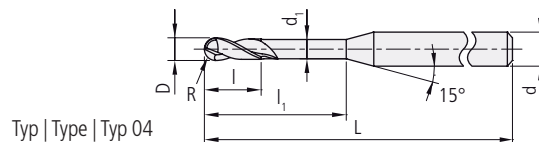
Typ | Type | Typ 02/04

Bezeichnung Désignation Designation	Hartmetall Carbure Carbide				Dimensionen Dimensions Dimensions							Typ Type Typ
	330				D	l	l ₁	d ₁	z	L	d	
MMS...	0/-0.01										0/-0.008	
	UHM 10	UHM 10 HX	UHM 20	UHM 20 HX								
MMS 0600 400 202			□	□	6	9	40	5.8	2	80	6	02
MMS 0600 450 201			□	□	6	45			2	90	6	01
MMS 0600 500 201			■	■	6	50			2	90	6	01
MMS 0600 500 202			□	□	6	9	50	5.8	2	100	6	02
MMS 0600 600 201			■	■	6	60			2	100	6	01
MMS 0600 600 202			■	■	6	9	60	5.8	2	120	6	02
MMS 0650 130 206			□	□	6.5	13			2	60	6.5	06
MMS 0650 160 406			□	□	6.5	16			4	60	6.5	06
MMS 0700 130 206			□	□	7	13			2	60	7	06
MMS 0700 160 406			□	□	7	16			4	60	7	06
MMS 0750 160 206			□	□	7.5	16			2	63	7.5	06
MMS 0750 190 406			□	□	7.5	19			4	63	7.5	06
MMS 0800 160 206			■	■	8	16			2	63	8	06
MMS 0800 190 406			■	■	8	19			4	63	8	06
MMS 0800 300 206			■	■	8	30			2	75	8	06
MMS 0800 300 406			■	■	8	30			4	75	8	06
MMS 0850 160 206			□	□	8.5	16			2	67	8.5	06
MMS 0850 190 406			□	□	8.5	19			4	67	8.5	06
MMS 0900 160 206			□	□	9	16			2	67	9	06
MMS 0900 190 406			□	□	9	19			4	67	9	06
MMS 0950 190 206			□	□	9.5	19			2	72	9.5	06
MMS 0950 220 406			□	□	9.5	22			4	72	9.5	06
MMS 1000 190 206			■	■	10	19			2	72	10	06
MMS 1000 220 406			■	■	10	22			4	72	10	06
MMS 1000 400 206			■	■	10	40			2	100	10	06
MMS 1000 400 406			■	■	10	40			4	100	10	06
MMS 1100 220 206			□	□	11	22			2	83	11	06
MMS 1100 260 406			□	□	11	26			4	83	11	06
MMS 1200 220 206			■	■	12	22			2	83	12	06
MMS 1200 260 406			■	■	12	26			4	83	12	06
MMS 1200 450 206			■	■	12	45			2	100	12	06
MMS 1200 450 406			■	■	12	45			4	100	12	06
MMS 1300 220 206			□	□	13	22			2	83	13	06
MMS 1300 260 406			□	□	13	26			4	83	13	06
MMS 1400 220 206			□	□	14	22			2	83	14	06
MMS 1400 260 406			□	□	14	26			4	83	14	06
MMS 1400 450 206			□	□	14	45			2	100	14	06
MMS 1400 450 406			□	□	14	45			4	100	14	06
MMS 1500 260 206			□	□	15	26			2	92	15	06
MMS 1500 320 406			□	□	15	32			4	92	15	06
MMS 1600 260 206			□	□	16	26			2	92	16	06
MMS 1600 320 406			□	□	16	32			4	92	16	06
MMS 1600 450 206			□	□	16	45			2	100	16	06
MMS 1600 450 406			□	□	16	45			4	100	16	06
MMS 1800 260 206			□	□	18	26			2	92	18	06
MMS 1800 320 406			□	□	18	32			4	92	18	06
MMS 1800 450 206			□	□	18	45			2	100	18	06
MMS 1800 450 406			□	□	18	45			4	100	18	06
MMS 2000 320 206			□	□	20	32			2	104	20	06
MMS 2000 380 406			□	□	20	38			4	104	20	06
MMS 2000 450 206			□	□	20	45			2	100	20	06
MMS 2000 450 406			□	□	20	45			4	100	20	06

Nuten-/Taschenfräsen | Rainures/poches | Slotting/form- and die cutting



Typ | Type | Typ 01/03/05/06

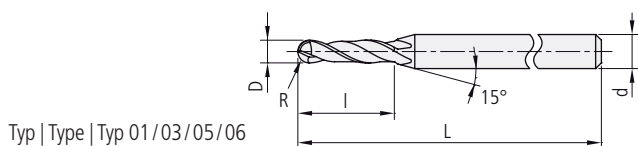


Typ | Type | Typ 04

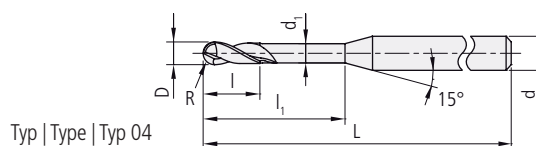
Bezeichnung Désignation Designation	Hartmetall Carbure Carbide				Dimensionen Dimensions Dimensions								Typ Type Typ	
	330				D	R	l	l ₁	d ₁	z	L	d		
	—	○	●	●										
	—	●	—	●										
MMB...	○	●	—	—	0/-0.01	±0.01							0/-0.008	
	●	●	—	—										
	... UHM 10	... UHM 10 HX	... UHM 20	... UHM 20 HX										
MMB 0020 004 205			■	□	0.2	0.1	0.4			2	40	3	05	
MMB 0020 006 203	□				0.2	0.1	0.6			2	45	4	03	
MMB 0020 010 201			□		0.2	0.1	1			2	40	3	01	
MMB 0020 015 201			□		0.2	0.1	1.5			2	40	3	01	
MMB 0020 020 201			■	□	0.2	0.1	2			2	40	3	01	
MMB 0020 020 204	□				0.2	0.1	0.3	2	0.18	2	45	4	04	
MMB 0020 040 204	□				0.2	0.1	0.3	4	0.18	2	45	4	04	
MMB 0025 005 205			■	□	0.25	0.125	0.5			2	40	3	05	
MMB 0030 010 205			■	□	0.3	0.15	1			2	40	3	05	
MMB 0035 010 205			■	□	0.35	0.175	1			2	40	3	05	
MMB 0040 008 203	□				0.4	0.2	0.8			2	45	4	03	
MMB 0040 010 205			■	□	0.4	0.2	1			2	40	3	05	
MMB 0040 020 201			■	□	0.4	0.2	2			2	40	3	01	
MMB 0040 020 204	□				0.4	0.2	0.6	2	0.37	2	45	4	04	
MMB 0040 030 201			□		0.4	0.2	3			2	40	3	01	
MMB 0040 040 201			■	□	0.4	0.2	4			2	40	3	01	
MMB 0040 040 204	□				0.4	0.2	0.6	4	0.37	2	45	4	04	
MMB 0050 010 205			■	■	0.5	0.25	1			2	40	3	05	
MMB 0050 015 203	□	□			0.5	0.25	1.5			2	45	4	03	
MMB 0050 020 204	□	□			0.5	0.25	0.8	2	0.45	2	45	4	04	
MMB 0050 040 204	■	■			0.5	0.25	0.8	4	0.45	2	45	4	04	
MMB 0050 060 204	■	■			0.5	0.25	0.8	6	0.45	2	45	4	04	
MMB 0050 080 204	□	□			0.5	0.25	0.8	8	0.45	2	45	4	04	
MMB 0050 100 204	□	□			0.5	0.25	0.8	10	0.45	2	50	4	04	
MMB 0050 120 204	□	□			0.5	0.25	0.8	12	0.45	2	50	4	04	
MMB 0050 150 204	□	□			0.5	0.25	0.8	15	0.45	2	50	4	04	
MMB 0060 020 203	■	■			0.6	0.3	2			2	45	4	03	
MMB 0060 020 205			■	■	0.6	0.3	2			2	40	3	05	
MMB 0060 040 201			■	■	0.6	0.3	4			2	40	3	01	
MMB 0060 040 204	■	■			0.6	0.3	1	4	0.55	2	45	4	04	
MMB 0060 060 201			■	■	0.6	0.3	6			2	40	3	01	
MMB 0060 060 204	□	□			0.6	0.3	1	6	0.55	2	45	4	04	
MMB 0060 080 201			□	□	0.6	0.3	8			2	40	3	01	
MMB 0060 100 201			□	□	0.6	0.3	10			2	40	3	01	
MMB 0060 100 204	□	□			0.6	0.3	1	10	0.55	2	50	4	04	
MMB 0070 020 205			■	■	0.7	0.35	2			2	40	3	05	
MMB 0080 025 203	□	□			0.8	0.4	2.5			2	45	4	03	
MMB 0080 025 205			■	■	0.8	0.4	2.5			2	40	3	05	
MMB 0080 040 201			□	□	0.8	0.4	4			2	40	3	01	
MMB 0080 040 204	□	□			0.8	0.4	1.2	4	0.75	2	45	4	04	
MMB 0080 060 201			□	□	0.8	0.4	6			2	40	3	01	
MMB 0080 060 204	□	□			0.8	0.4	1.2	6	0.75	2	45	4	04	

Nuten-/Taschenfräsen | Rainures/poches | Slotting/form- and die cutting

Fortsetzung | Suite | Continuation



Typ | Type | Typ 01/03/05/06



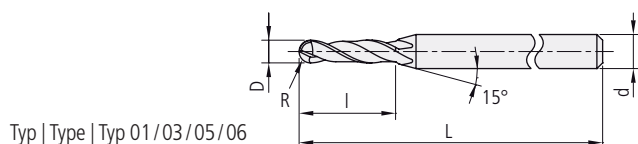
Typ | Type | Typ 04

Bezeichnung Désignation Designation	Hartmetall Carbure Carbide				Dimensionen Dimensions Dimensions								Typ Type Typ
	 330				D	R	l	l ₁	d ₁	z	L	d	
	—	○	●	■									
	—	●	—	●									
MMB...	○	●	—	—	0/-0.01	±0.01							0/-0.008
	●	●	—	—									
	UHM 10 ...	UHM 10 HX ...	UHM 20 ...	UHM 20 HX ...									
MMB 0080 080 201			■	■	0.8	0.4	8			2	40	3	01
MMB 0080 100 201			■	■	0.8	0.4	10			2	40	3	01
MMB 0080 100 204	□	□			0.8	0.4	1.2	10	0.75	2	50	4	04
MMB 0080 120 204	□	□			0.8	0.4	1.2	12	0.75	2	50	4	04
MMB 0090 025 205			■	■	0.9	0.45	2.5			2	40	3	05
MMB 0100 030 203	□	□			1	0.5	3			2	50	4	03
MMB 0100 030 205			■	■	1	0.5	3			2	40	3	05
MMB 0100 040 201			■	■	1	0.5	4			2	45	4	01
MMB 0100 040 204	□	□			1	0.5	1.5	4	0.9	2	50	4	04
MMB 0100 060 201			■	■	1	0.5	6			2	45	4	01
MMB 0100 080 201			■	■	1	0.5	8			2	45	4	01
MMB 0100 080 204	□	□			1	0.5	1.5	8	0.9	2	50	4	04
MMB 0100 100 201			■	■	1	0.5	10			2	45	4	01
MMB 0100 120 204	■	■			1	0.5	1.5	12	0.9	2	50	4	04
MMB 0100 160 204	□	□			1	0.5	1.5	16	0.9	2	60	4	04
MMB 0100 200 204	□	□			1	0.5	1.5	20	0.9	2	60	4	04
MMB 0100 250 204	■	■			1	0.5	1.5	25	0.9	2	70	4	04
MMB 0100 300 204	□	□			1	0.5	1.5	30	0.9	2	70	4	04
MMB 0110 030 205			□	□	1.1	0.55	3			2	40	3	05
MMB 0120 030 205			■	■	1.2	0.6	3			2	40	3	05
MMB 0120 035 203	□	□			1.2	0.6	3.5			2	50	4	03
MMB 0120 080 204	□	□			1.2	0.6	1.8	8	1.1	2	50	4	04
MMB 0120 120 204	□	□			1.2	0.6	1.8	12	1.1	2	50	4	04
MMB 0120 160 204	□	□			1.2	0.6	1.8	16	1.1	2	60	4	04
MMB 0130 030 205			□	□	1.3	0.65	3			2	40	3	05
MMB 0140 030 205			■	■	1.4	0.7	3			2	40	3	05
MMB 0140 040 203	□	□			1.4	0.7	4			2	50	4	03
MMB 0140 080 204	□	□			1.4	0.7	2	8	1.3	2	50	4	04
MMB 0140 120 204	□	□			1.4	0.7	2	12	1.3	2	50	4	04
MMB 0140 160 204	□	□			1.4	0.7	2	16	1.3	2	60	4	04
MMB 0150 050 203	□	□			1.5	0.75	5			2	50	4	03
MMB 0150 050 205			■	■	1.5	0.75	5			2	40	3	05
MMB 0150 080 204	□	□			1.5	0.75	2.2	8	1.4	2	50	4	04
MMB 0150 120 204	□	□			1.5	0.75	2.2	12	1.4	2	50	4	04
MMB 0150 160 204	□	□			1.5	0.75	2.2	16	1.4	2	60	4	04
MMB 0150 200 204	□	□			1.5	0.75	2.2	20	1.4	2	60	4	04
MMB 0150 250 204	□	□			1.5	0.75	2.2	25	1.4	2	70	4	04
MMB 0160 050 203	□	□			1.6	0.8	5			2	50	4	03
MMB 0160 050 205			■	■	1.6	0.8	5			2	40	3	05
MMB 0160 120 204	□	□			1.6	0.8	2.4	12	1.5	2	50	4	04
MMB 0160 160 204	□	□			1.6	0.8	2.4	16	1.5	2	60	4	04
MMB 0160 200 204	□	□			1.6	0.8	2.4	20	1.5	2	60	4	04
MMB 0170 050 205			□	□	1.7	0.85	5			2	40	3	05
MMB 0180 050 203	□	□			1.8	0.9	5			2	50	4	03
MMB 0180 050 205			■	■	1.8	0.9	5			2	40	3	05
MMB 0180 120 204	□	□			1.8	0.9	2.5	12	1.7	2	50	4	04
MMB 0180 160 204	□	□			1.8	0.9	2.5	16	1.7	2	60	4	04
MMB 0180 200 204	□	□			1.8	0.9	2.5	20	1.7	2	60	4	04
MMB 0190 050 205			□	□	1.9	0.95	5			2	40	3	05
MMB 0200 060 201			■	■	2	1	6			2	45	4	01

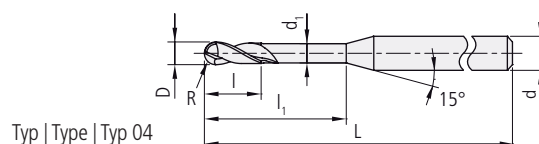
Legende | Légende | Legend □ 4

Nuten-/Taschenfräsen | Rainures/poches | Slotting/form- and die cutting

Fortsetzung | Suite | Continuation



Typ | Type | Typ 01/03/05/06

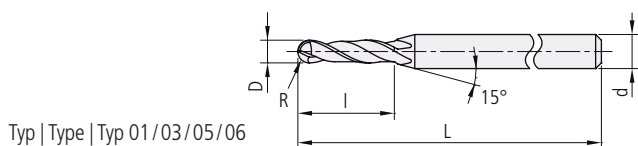


Typ | Type | Typ 04

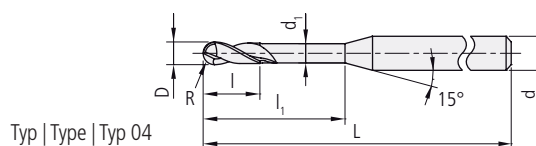
Bezeichnung Désignation Designation	Hartmetall Carbure Carbide				Dimensionen Dimensions Dimensions								Typ Type Typ
	 330				D	R	l	l ₁	d ₁	z	L	d	
	—	○	●	●									
	—	●	—	●									
MMB...	○	●	—	—	0/-0.01	±0.01						0/-0.008	
	○	●	—	—									
	○	●	—	—									
	●	●	—	—									
	UHM 10 ...	UHM 10 HX ...	UHM 20 ...	UHM 20 HX ...									
MMB 0200 060 203	□	□			2	1	6			2	50	4	03
MMB 0200 060 205			■	■	2	1	6			2	40	3	05
MMB 0200 080 201			■	■	2	1	8			2	45	4	01
MMB 0200 080 204	□	□			2	1	3	8	1.9	2	50	4	04
MMB 0200 100 201			■	■	2	1	10			2	45	4	01
MMB 0200 120 201			■	■	2	1	12			2	45	4	01
MMB 0200 120 204	□	□			2	1	3	12	1.9	2	50	4	04
MMB 0200 150 201			■	■	2	1	15			2	50	4	01
MMB 0200 160 204	□	□			2	1	3	16	1.9	2	60	4	04
MMB 0200 200 201			■	■	2	1	20			2	60	4	01
MMB 0200 200 204	■	■			2	1	3	20	1.9	2	60	4	04
MMB 0200 250 204	□	□			2	1	3	25	1.9	2	70	4	04
MMB 0200 300 204	■	■			2	1	3	30	1.9	2	70	4	04
MMB 0200 350 204	□	□			2	1	3	35	1.9	2	80	4	04
MMB 0200 400 204	■	■			2	1	3	40	1.9	2	80	4	04
MMB 0210 060 205			□	□	2.1	1.05	6			2	40	3	05
MMB 0220 060 205			■	■	2.2	1.1	6			2	40	3	05
MMB 0230 060 205			□	□	2.3	1.15	6			2	40	3	05
MMB 0240 060 205			■	■	2.4	1.2	6			2	40	3	05
MMB 0250 080 205			■	■	2.5	1.25	8			2	40	3	05
MMB 0260 080 205			■	■	2.6	1.3	8			2	40	3	05
MMB 0270 080 205			□	□	2.7	1.35	8			2	40	3	05
MMB 0280 080 205			■	■	2.8	1.4	8			2	40	3	05
MMB 0290 080 205			□	□	2.9	1.45	8			2	40	3	05
MMB 0300 080 204	□	□			3	1.5	4	8	2.8	2	50	6	04
MMB 0300 080 205			■	■	3	1.5	8			2	40	3	05
MMB 0300 100 203	□	□			3	1.5	10			2	60	6	03
MMB 0300 120 204	□	□			3	1.5	4	12	2.8	2	50	6	04
MMB 0300 150 201			■	■	3	1.5	15			2	70	6	01
MMB 0300 150 203	□	□			3	1.5	15			2	80	3	03
MMB 0300 160 204	□	□			3	1.5	4	16	2.8	2	60	6	04
MMB 0300 200 201			■	■	3	1.5	20			2	70	6	01
MMB 0300 200 204	□	□			3	1.5	4	20	2.8	2	60	6	04
MMB 0300 250 201			■	■	3	1.5	25			2	80	6	01
MMB 0300 250 204	□	□			3	1.5	4	25	2.8	2	70	6	04
MMB 0300 300 201			■	■	3	1.5	30			2	80	6	01
MMB 0300 300 204	□	□			3	1.5	4	30	2.8	2	70	6	04
MMB 0300 350 204	□	□			3	1.5	4	35	2.8	2	80	6	04
MMB 0300 400 204	□	□			3	1.5	4	40	2.8	2	80	6	04
MMB 0400 120 203	□	□			4	2	12			2	60	6	03
MMB 0400 120 204	□	□			4	2	5	12	3.8	2	50	6	04
MMB 0400 150 201			■	■	4	2	15			2	70	6	01
MMB 0400 160 204	□	□			4	2	5	16	3.8	2	60	6	04
MMB 0400 180 203	■	■			4	2	18			2	80	4	03
MMB 0400 200 201			■	■	4	2	20			2	80	6	01
MMB 0400 200 204	■	■			4	2	5	20	3.8	2	60	6	04
MMB 0400 250 201			■	■	4	2	25			2	80	6	01
MMB 0400 250 204	□	□			4	2	5	25	3.8	2	70	6	04
MMB 0400 300 201			■	■	4	2	30			2	80	6	01
MMB 0400 300 204	□	□			4	2	5	30	3.8	2	70	6	04

Nuten-/Taschenfräsen | Rainures/poches | Slotting/form- and die cutting

Fortsetzung | Suite | Continuation



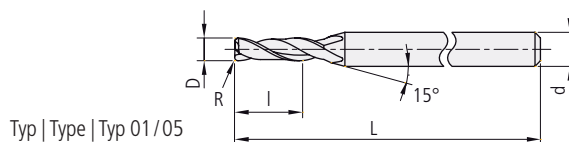
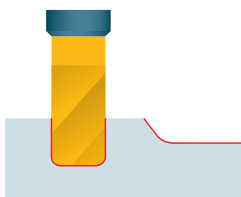
Typ | Type | Typ 01/03/05/06



Typ | Type | Typ 04

Bezeichnung Désignation Designation	Hartmetall Carbure Carbide				Dimensionen Dimensions Dimensions								Typ Type Typ
	 330				D	R	l	l ₁	d ₁	z	L	d	
	—	○	●	●									
	—	●	—	●									
MMB...	○	●	—	—	0/-0.01	±0.01							
	●	●	—	—									
	UHM 10 ...	UHM 10 HX ...	UHM 20 ...	UHM 20 HX ...									
MMB 0400 350 204	□	□			4	2	5	35	3.8	2	80	6	04
MMB 0400 400 201			■	■	4	2	40			2	90	6	01
MMB 0400 400 204	□	□			4	2	5	40	3.8	2	80	6	04
MMB 0400 450 204	□	□			4	2	5	45	3.8	2	100	6	04
MMB 0400 500 204	□	□			4	2	5	50	3.8	2	100	6	04
MMB 0500 150 203	□	□			5	2.5	15			2	60	6	03
MMB 0500 160 204	□	□			5	2.5	6	16	4.8	2	60	6	04
MMB 0500 200 204	□	□			5	2.5	6	20	4.8	2	60	6	04
MMB 0500 300 204	□	□			5	2.5	6	30	4.8	2	70	6	04
MMB 0500 400 204	□	□			5	2.5	6	40	4.8	2	80	6	04
MMB 0500 500 204	□	□			5	2.5	6	50	4.8	2	100	6	04
MMB 0600 150 203	□	□			6	3	15			2	60	6	03
MMB 0600 200 203	□	□			6	3	20			2	100	6	03
MMB 0600 300 201			■	■	6	3	30			2	90	6	01
MMB 0600 400 201			□	□	6	3	40			2	90	6	01
MMB 0600 500 201			■	■	6	3	50			2	100	6	01
MMB 0800 090 206				■	8	4	9			2	59	8	06
MMB 0800 300 206				■	8	4	30			2	75	8	06
MMB 1000 100 206				■	10	5	10			2	60	10	06
MMB 1000 400 206				■	10	5	40			2	100	10	06
MMB 1200 140 206				■	12	6	14			2	71	12	06
MMB 1200 450 206				■	12	6	45			2	100	12	06
MMB 1400 140 206				□	14	7	14			2	71	14	06
MMB 1400 450 206				□	14	7	45			2	100	14	06
MMB 1600 160 206				□	16	8	16			2	76	16	06
MMB 1600 450 206				□	16	8	45			2	100	16	06
MMB 1800 180 206				□	18	9	18			2	76	18	06
MMB 1800 450 206				□	18	9	45			2	100	18	06
MMB 2000 200 206				□	20	10	20			2	82	20	06
MMB 2000 450 206				□	20	10	45			2	100	20	06

Nuten-/Taschenfräsen | Rainures/poches | Slotting/form- and die cutting

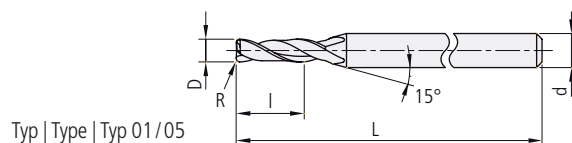


Typ | Type | Typ 01/05

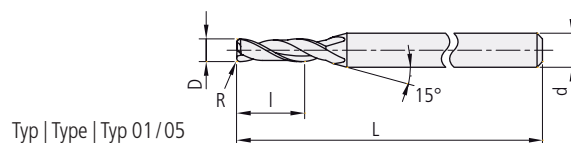
Bezeichnung Désignation Designation	Hartmetall Carbure Carbide				Dimensionen Dimensions Dimensions								Typ Type Typ
	330				D	R	l	z	L	d			
	—	○	●	●									
	—	●	—	●									
MMR...	○	●	—	—	0/-0.01	±0.01							
	●	●	—	—									
	... UHM 10	... UHM 10 HX	... UHM 20	... UHM 20 HX									
MMR 0050 010-015 205				■	0.5	0.1	1.5	2	60	3			05
MMR 0050 020-015 205				□	0.5	0.2	1.5	2	60	3			05
MMR 0060 010-020 205				■	0.6	0.1	2	2	60	3			05
MMR 0060 020-020 205				□	0.6	0.2	2	2	60	3			05
MMR 0070 010-020 205				■	0.7	0.1	2	2	60	3			05
MMR 0070 020-020 205				□	0.7	0.2	2	2	60	3			05
MMR 0080 010-025 205				■	0.8	0.1	2.5	2	60	3			05
MMR 0080 020-025 205				□	0.8	0.2	2.5	2	60	3			05
MMR 0090 010-030 205				■	0.9	0.1	3	2	60	3			05
MMR 0090 020-030 205				□	0.9	0.2	3	2	60	3			05
MMR 0100 010-030 201			□	□	1	0.1	3	2	40	4			01
MMR 0100 010-030 205				■	1	0.1	3	2	60	3			05
MMR 0100 010-030 405				■	1	0.1	3	4	60	3			05
MMR 0100 015-030 201			□	□	1	0.15	3	2	40	4			01
MMR 0100 020-030 201			□	□	1	0.2	3	2	40	4			01
MMR 0100 020-030 205				■	1	0.2	3	2	60	3			05
MMR 0100 020-030 405				□	1	0.2	3	4	60	3			05
MMR 0100 025-030 201			□	□	1	0.25	3	2	40	4			01
MMR 0100 030-030 201			□	□	1	0.3	3	2	40	4			01
MMR 0100 030-030 205				□	1	0.3	3	2	60	3			05
MMR 0100 030-030 405				□	1	0.3	3	4	60	3			05
MMR 0150 010-040 201			□	□	1.5	0.1	4	2	40	4			01
MMR 0150 010-040 205				■	1.5	0.1	4	2	60	3			05
MMR 0150 010-040 405				□	1.5	0.1	4	4	60	3			05
MMR 0150 015-040 201			□	□	1.5	0.15	4	2	40	4			01
MMR 0150 020-040 201			□	□	1.5	0.2	4	2	40	4			01
MMR 0150 020-040 205				■	1.5	0.2	4	2	60	3			05
MMR 0150 020-040 405				□	1.5	0.2	4	4	60	3			05
MMR 0150 025-040 201			□	□	1.5	0.25	4	2	40	4			01
MMR 0150 030-040 201			□	□	1.5	0.3	4	2	40	4			01
MMR 0150 030-040 205				□	1.5	0.3	4	2	60	3			05
MMR 0150 030-040 405				□	1.5	0.3	4	4	60	3			05
MMR 0150 050-040 205				□	1.5	0.5	4	2	60	3			05
MMR 0150 050-040 405				□	1.5	0.5	4	4	60	3			05
MMR 0200 010-060 201			□	□	2	0.1	6	2	40	4			01
MMR 0200 010-060 205				■	2	0.1	6	2	60	3			05
MMR 0200 010-060 405				□	2	0.1	6	4	60	3			05
MMR 0200 015-060 201			□	□	2	0.15	6	2	40	4			01
MMR 0200 020-060 201			□	□	2	0.2	6	2	40	4			01
MMR 0200 020-060 205				■	2	0.2	6	2	60	3			05
MMR 0200 020-060 405				□	2	0.2	6	4	60	3			05
MMR 0200 025-060 201			□	□	2	0.25	6	2	40	4			01

Nuten-/Taschenfräsen | Rainures/poches | Slotting/form- and die cutting

Fortsetzung | Suite | Continuation

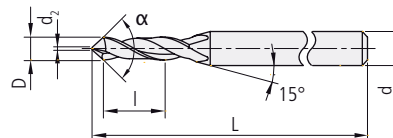
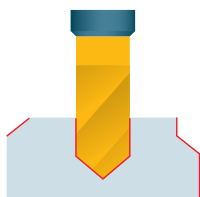


Bezeichnung Désignation Designation	Hartmetall Carbure Carbide				Dimensionen Dimensions Dimensions								Typ Type Typ
	330				D	R	l	z	L	d			
	—	○	●	●									
MMR...	—	●	—	●	0/-0.01	±0.01					0/-0.008		
	○	●	—	—									
	●	●	—	—									
	UHM 10 ...	UHM 10 HX ...	UHM 20 ...	UHM 20 HX ...									
MMR 0200 030-060 201			□	□	2	0.3	6	2	40	4			01
MMR 0200 030-060 205				□	2	0.3	6	2	60	3			05
MMR 0200 030-060 405				□	2	0.3	6	4	60	3			05
MMR 0200 035-060 201			□	□	2	0.35	6	2	40	4			01
MMR 0200 040-060 201			□	□	2	0.4	6	2	40	4			01
MMR 0200 045-060 201			□	□	2	0.45	6	2	40	4			01
MMR 0200 050-060 201			□	□	2	0.5	6	2	40	4			01
MMR 0200 050-060 205				□	2	0.5	6	2	60	3			05
MMR 0200 050-060 405				□	2	0.5	6	4	60	3			05
MMR 0250 010-080 201			□	□	2.5	0.1	8	2	40	4			01
MMR 0250 010-080 205				■	2.5	0.1	8	2	60	3			05
MMR 0250 010-080 405				□	2.5	0.1	8	4	60	3			05
MMR 0250 015-080 201			□	□	2.5	0.15	8	2	40	4			01
MMR 0250 020-080 201			□	□	2.5	0.2	8	2	40	4			01
MMR 0250 020-080 205				■	2.5	0.2	8	2	60	3			05
MMR 0250 020-080 405				□	2.5	0.2	8	4	60	3			05
MMR 0250 025-080 201			□	□	2.5	0.25	8	2	40	4			01
MMR 0250 030-080 201			□	□	2.5	0.3	8	2	40	4			01
MMR 0250 030-080 205				□	2.5	0.3	8	2	60	3			05
MMR 0250 030-080 405				□	2.5	0.3	8	4	60	3			05
MMR 0250 035-080 201			□	□	2.5	0.35	8	2	40	4			01
MMR 0250 040-080 201			□	□	2.5	0.4	8	2	40	4			01
MMR 0250 045-080 201			□	□	2.5	0.45	8	2	40	4			01
MMR 0250 050-080 201			□	□	2.5	0.5	8	2	40	4			01
MMR 0250 050-080 205				□	2.5	0.5	8	2	60	3			05
MMR 0250 050-080 405				□	2.5	0.5	8	4	60	3			05
MMR 0250 075-080 205				□	2.5	0.75	8	2	60	3			05
MMR 0250 075-080 405				□	2.5	0.75	8	4	60	3			05
MMR 0300 010-080 201			□	□	3	0.1	8	2	45	6			01
MMR 0300 010-100 205				■	3	0.1	10	2	60	3			05
MMR 0300 010-100 405				□	3	0.1	10	4	60	3			05
MMR 0300 015-080 201			□	□	3	0.15	8	2	45	6			01
MMR 0300 020-080 201			□	□	3	0.2	8	2	45	6			01
MMR 0300 020-100 205				■	3	0.2	10	2	60	3			05
MMR 0300 020-100 405				□	3	0.2	10	4	60	3			05
MMR 0300 025-080 201			□	□	3	0.25	8	2	45	6			01
MMR 0300 030-080 201			□	□	3	0.3	8	2	45	6			01
MMR 0300 030-100 205				□	3	0.3	10	2	60	3			05
MMR 0300 030-100 405				□	3	0.3	10	4	60	3			05
MMR 0300 035-080 201			□	□	3	0.35	8	2	45	6			01
MMR 0300 040-080 201			□	□	3	0.4	8	2	45	6			01
MMR 0300 045-080 201			□	□	3	0.45	8	2	45	6			01
MMR 0300 050-080 201			□	□	3	0.5	8	2	45	6			01
MMR 0300 050-100 205				□	3	0.5	10	2	60	3			05
MMR 0300 050-100 405				□	3	0.5	10	4	60	3			05
MMR 0300 075-080 201			□	□	3	0.75	8	2	45	6			01
MMR 0300 075-100 205				□	3	0.75	10	2	60	3			05
MMR 0300 075-100 405				□	3	0.75	10	4	60	3			05
MMR 0300 100-080 201			□	□	3	1	8	2	45	6			01
MMR 0300 100-100 205				□	3	1	10	2	60	3			05



Bezeichnung Désignation Designation	Hartmetall Carbure Carbide				Dimensionen Dimensions Dimensions								Typ Type Typ
	 330				D	R	l	z	L	d			
													
MMR...					0/-0.01	±0.01				0/-0.008			
	UHM 10 ...	UHM 10 HX ...	UHM 20 ...	UHM 20 HX ...									
MMR 0300 100-100 405					3	1	10	4	60	3		05	
MMR 0400 010-110 201					4	0.1	11	2	45	6		01	
MMR 0400 015-110 201					4	0.15	11	2	45	6		01	
MMR 0400 020-110 201					4	0.2	11	2	45	6		01	
MMR 0400 025-110 201					4	0.25	11	2	45	6		01	
MMR 0400 030-110 201					4	0.3	11	2	45	6		01	
MMR 0400 035-110 201					4	0.35	11	2	45	6		01	
MMR 0400 040-110 201					4	0.4	11	2	45	6		01	
MMR 0400 045-110 201					4	0.45	11	2	45	6		01	
MMR 0400 050-110 201					4	0.5	11	2	45	6		01	
MMR 0400 075-110 201					4	0.75	11	2	45	6		01	
MMR 0400 100-110 201					4	1	11	2	45	6		01	
MMR 0600 010-130 201					6	0.1	13	2	50	6		01	
MMR 0600 015-130 201					6	0.15	13	2	50	6		01	
MMR 0600 020-130 201					6	0.2	13	2	50	6		01	
MMR 0600 025-130 201					6	0.25	13	2	50	6		01	
MMR 0600 030-130 201					6	0.3	13	2	50	6		01	
MMR 0600 035-130 201					6	0.35	13	2	50	6		01	
MMR 0600 040-130 201					6	0.4	13	2	50	6		01	
MMR 0600 045-130 201					6	0.45	13	2	50	6		01	
MMR 0600 050-130 201					6	0.5	13	2	50	6		01	
MMR 0600 075-130 201					6	0.75	13	2	50	6		01	
MMR 0600 100-130 201					6	1	13	2	50	6		01	
MMR 0600 125-130 201					6	1.25	13	2	50	6		01	
MMR 0600 150-130 201					6	1.5	13	2	50	6		01	
MMR 0600 175-130 201					6	1.75	13	2	50	6		01	
MMR 0600 200-130 201					6	2	13	2	50	6		01	

Nuten-/Kanten-/Fasfräsen | Rainures/arêtes/chanfreins | Slotting/edge cutting/chamfer



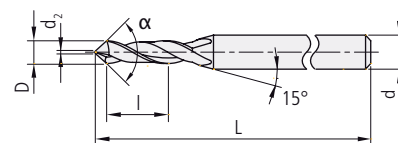
Typ | Type | Typ 01 / 06

Bezeichnung Désignation Designation	Hartmetall Carbure Carbide				Dimensionen Dimensions Dimensions							Typ Type Typ
	—	○	●	●	D	α	l	z	d ₂	L	d	
MMV...	—	○	●	●	0/-0.01	D<6.1: 0/+30° D>6.1: ±1°					0/-0.008	
	... UHM 10	... UHM 10 HX	... UHM 20	... UHM 20 HX								
MMV 0050 030-010 201			□	□	0.5	30	1	2	0.06	40	3	01
MMV 0050 045-010 201			□	□	0.5	45	1	2	0.06	40	3	01
MMV 0050 060-010 201			□	□	0.5	60	1	2	0.06	40	3	01
MMV 0050 070-010 201			□	□	0.5	70	1	2	0.06	40	3	01
MMV 0050 080-010 201			□	□	0.5	80	1	2	0.06	40	3	01
MMV 0050 090-010 201			■	■	0.5	90	1	2	0.06	40	3	01
MMV 0050 120-010 201			□	□	0.5	120	1	2	0.06	40	3	01
MMV 0060 060-012 201			□	□	0.6	60	1.2	2	0.06	40	3	01
MMV 0060 090-012 201			□	□	0.6	90	1.2	2	0.06	40	3	01
MMV 0060 120-012 201			□	□	0.6	120	1.2	2	0.06	40	3	01
MMV 0070 060-014 201			□	□	0.7	60	1.4	2	0.06	40	3	01
MMV 0070 090-014 201			□	□	0.7	90	1.4	2	0.06	40	3	01
MMV 0070 120-014 201			□	□	0.7	120	1.4	2	0.06	40	3	01
MMV 0080 060-016 201			□	□	0.8	60	1.6	2	0.06	40	3	01
MMV 0080 090-016 201			□	□	0.8	90	1.6	2	0.06	40	3	01
MMV 0080 120-016 201			□	□	0.8	120	1.6	2	0.06	40	3	01
MMV 0090 060-020 201			□	□	0.9	60	2	2	0.06	40	3	01
MMV 0090 090-020 201			□	□	0.9	90	2	2	0.06	40	3	01
MMV 0090 120-020 201			□	□	0.9	120	2	2	0.06	40	3	01
MMV 0100 030-020 201			■	■	1	30	2	2	0.08	45	4	01
MMV 0100 045-020 201			■	■	1	45	2	2	0.08	45	4	01
MMV 0100 060-020 201			■	■	1	60	2	2	0.08	45	4	01
MMV 0100 070-020 201			□	□	1	70	2	2	0.08	45	4	01
MMV 0100 080-020 201			□	□	1	80	2	2	0.08	45	4	01
MMV 0100 090-020 201			■	■	1	90	2	2	0.10	45	4	01
MMV 0100 120-020 201			□	□	1	120	2	2	0.10	45	4	01
MMV 0110 060-025 201			□	□	1.1	60	2.5	2	0.08	45	4	01
MMV 0110 090-025 201			□	□	1.1	90	2.5	2	0.10	45	4	01
MMV 0110 120-025 201			□	□	1.1	120	2.5	2	0.10	45	4	01
MMV 0120 060-025 201			□	□	1.2	60	2.5	2	0.08	45	4	01
MMV 0120 090-025 201			□	□	1.2	90	2.5	2	0.10	45	4	01
MMV 0120 120-025 201			□	□	1.2	120	2.5	2	0.10	45	4	01
MMV 0130 060-030 201			□	□	1.3	60	3	2	0.08	45	4	01
MMV 0130 090-030 201			□	□	1.3	90	3	2	0.10	45	4	01
MMV 0130 120-030 201			□	□	1.3	120	3	2	0.10	45	4	01
MMV 0140 060-030 201			□	□	1.4	60	3	2	0.08	45	4	01
MMV 0140 090-030 201			□	□	1.4	90	3	2	0.10	45	4	01
MMV 0140 120-030 201			□	□	1.4	120	3	2	0.10	45	4	01
MMV 0150 030-030 201			□	□	1.5	30	3	2	0.08	45	4	01
MMV 0150 045-030 201			□	□	1.5	45	3	2	0.08	45	4	01
MMV 0150 060-030 201			□	□	1.5	60	3	2	0.08	45	4	01
MMV 0150 070-030 201			□	□	1.5	70	3	2	0.08	45	4	01

Nuten-/Kanten-/Fasfräsen | Rainures/arêtes/chanfreins | Slotting/edge cutting/chamfer

Fortsetzung | Suite | Continuation

Typ | Type | Typ 01 / 06

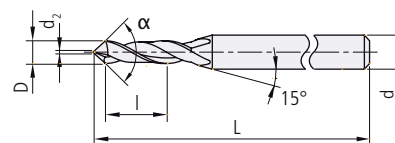


Bezeichnung Désignation Designation	Hartmetall Carbure Carbide				Dimensionen Dimensions Dimensions								Typ Type Typ
					D	α	l	z	d ₂	L	d		
	—	○	●	●									
	—	●	—	●									
MMV...	○	●	—	—	0/-0.01	D<6.1: 0/+30' D>6.1: ±1°						0/-0.008	
	●	●	—	—									
	... UHM 10	... UHM 10 HX	... UHM 20	... UHM 20 HX									
MMV 0150 080-030 201			☐	☐	1.5	80	3	2	0.08	45	4		01
MMV 0150 090-030 201			☐	☐	1.5	90	3	2	0.10	45	4		01
MMV 0150 120-030 201			☐	☐	1.5	120	3	2	0.10	45	4		01
MMV 0160 060-035 201			☐	☐	1.6	60	3.5	2	0.08	45	4		01
MMV 0160 090-035 201			☐	☐	1.6	90	3.5	2	0.10	45	4		01
MMV 0160 120-035 201			☐	☐	1.6	120	3.5	2	0.10	45	4		01
MMV 0170 060-035 201			☐	☐	1.7	60	3.5	2	0.08	45	4		01
MMV 0170 090-035 201			☐	☐	1.7	90	3.5	2	0.10	45	4		01
MMV 0170 120-035 201			☐	☐	1.7	120	3.5	2	0.10	45	4		01
MMV 0180 060-040 201			☐	☐	1.8	60	4	2	0.08	45	4		01
MMV 0180 090-040 201			☐	☐	1.8	90	4	2	0.10	45	4		01
MMV 0180 120-040 201			☐	☐	1.8	120	4	2	0.10	45	4		01
MMV 0190 060-040 201			☐	☐	1.9	60	4	2	0.08	45	4		01
MMV 0190 090-040 201			☐	☐	1.9	90	4	2	0.10	45	4		01
MMV 0190 120-040 201			☐	☐	1.9	120	4	2	0.10	45	4		01
MMV 0200 030-040 201			☐	☐	2	30	4	2	0.10	45	4		01
MMV 0200 045-040 201			☐	☐	2	45	4	2	0.10	45	4		01
MMV 0200 060-040 201			☐	☐	2	60	4	2	0.10	45	4		01
MMV 0200 070-040 201			☐	☐	2	70	4	2	0.10	45	4		01
MMV 0200 080-040 201			☐	☐	2	80	4	2	0.10	45	4		01
MMV 0200 090-040 201			☒	☒	2	90	4	2	0.20	45	4		01
MMV 0200 120-040 201			☐	☐	2	120	4	2	0.20	45	4		01
MMV 0210 060-045 201			☐	☐	2.1	60	4.5	2	0.10	45	4		01
MMV 0210 090-045 201			☐	☐	2.1	90	4.5	2	0.20	45	4		01
MMV 0210 120-045 201			☐	☐	2.1	120	4.5	2	0.20	45	4		01
MMV 0220 060-045 201			☐	☐	2.2	60	4.5	2	0.10	45	4		01
MMV 0220 090-045 201			☐	☐	2.2	90	4.5	2	0.20	45	4		01
MMV 0220 120-045 201			☐	☐	2.2	120	4.5	2	0.20	45	4		01
MMV 0230 060-050 201			☐	☐	2.3	60	5	2	0.10	45	4		01
MMV 0230 090-050 201			☐	☐	2.3	90	5	2	0.20	45	4		01
MMV 0230 120-050 201			☐	☐	2.3	120	5	2	0.20	45	4		01
MMV 0240 060-050 201			☐	☐	2.4	60	5	2	0.10	45	4		01
MMV 0240 090-050 201			☐	☐	2.4	90	5	2	0.20	45	4		01
MMV 0240 120-050 201			☐	☐	2.4	120	5	2	0.20	45	4		01
MMV 0250 030-050 201			☐	☐	2.5	30	5	2	0.10	45	4		01
MMV 0250 045-050 201			☐	☐	2.5	45	5	2	0.10	45	4		01
MMV 0250 060-050 201			☐	☐	2.5	60	5	2	0.10	45	4		01
MMV 0250 070-050 201			☐	☐	2.5	70	5	2	0.10	45	4		01
MMV 0250 080-050 201			☐	☐	2.5	80	5	2	0.10	45	4		01
MMV 0250 090-050 201			☐	☐	2.5	90	5	2	0.20	45	4		01
MMV 0250 120-050 201			☐	☐	2.5	120	5	2	0.20	45	4		01
MMV 0260 060-060 201			☐	☐	2.6	60	6	2	0.10	45	4		01
MMV 0260 090-060 201			☐	☐	2.6	90	6	2	0.20	45	4		01
MMV 0260 120-060 201			☐	☐	2.6	120	6	2	0.20	45	4		01
MMV 0270 060-060 201			☐	☐	2.7	60	6	2	0.10	45	4		01
MMV 0270 090-060 201			☐	☐	2.7	90	6	2	0.20	45	4		01
MMV 0270 120-060 201			☐	☐	2.7	120	6	2	0.20	45	4		01
MMV 0280 060-060 201			☐	☐	2.8	60	6	2	0.10	45	4		01
MMV 0280 090-060 201			☐	☐	2.8	90	6	2	0.20	45	4		01
MMV 0280 120-060 201			☐	☐	2.8	120	6	2	0.20	45	4		01

Legende | Légende | Legend □ 4

Nuten-/Kanten-/Fasfräsen | Rainures/arêtes/chanfreins | Slotting/edge cutting/chamfer

Fortsetzung | Suite | Continuation



Typ | Type | Typ 01/06

Bezeichnung Désignation Designation	Hartmetall Carbure Carbide				Dimensionen Dimensions Dimensions							Typ Type Typ
	—	○	●	□	D	α	l	z	d ₂	L	d	
MMV...	—	○	●	□	0/-0.01	D<6.1: 0/+30° D>6.1: ±1°					0/-0.008	
	UHM 10	UHM 10 HX	UHM 20	UHM 20 HX								
MMV 0290 060-060 201			□	□	2.9	60	6	2	0.10	45	4	01
MMV 0290 090-060 201			□	□	2.9	90	6	2	0.20	45	4	01
MMV 0290 120-060 201			□	□	2.9	120	6	2	0.20	45	4	01
MMV 0300 030-060 201			■	■	3	30	6	2	0.10	45	4	01
MMV 0300 045-060 201			■	■	3	45	6	2	0.10	45	4	01
MMV 0300 060-060 201			■	■	3	60	6	2	0.10	45	4	01
MMV 0300 070-060 201			□	□	3	70	6	2	0.10	45	4	01
MMV 0300 080-060 201			□	□	3	80	6	2	0.10	45	4	01
MMV 0300 090-060 201			■	■	3	90	6	2	0.20	45	4	01
MMV 0300 120-060 201			□	□	3	120	6	2	0.20	45	4	01
MMV 0350 090-070 201			□	□	3.5	90	7	2	0.20	50	6	01
MMV 0350 120-070 201			□	□	3.5	120	7	2	0.20	50	6	01
MMV 0400 030-080 201			□	□	4	30	8	2	0.15	60	6	01
MMV 0400 045-080 201			□	□	4	45	8	2	0.15	60	6	01
MMV 0400 060-080 201			□	□	4	60	8	2	0.15	50	6	01
MMV 0400 070-080 201			□	□	4	70	8	2	0.15	50	6	01
MMV 0400 080-080 201			□	□	4	80	8	2	0.15	50	6	01
MMV 0400 090-080 201			■	■	4	90	8	2	0.20	50	6	01
MMV 0400 120-080 201			□	□	4	120	8	2	0.20	50	6	01
MMV 0450 090-090 201			□	□	4.5	90	9	2	0.30	50	6	01
MMV 0450 120-090 201			□	□	4.5	120	9	2	0.30	50	6	01
MMV 0500 030-100 201			□	□	5	30	10	2	0.20	70	6	01
MMV 0500 045-100 201			□	□	5	45	10	2	0.20	70	6	01
MMV 0500 060-100 201			□	□	5	60	10	2	0.20	60	6	01
MMV 0500 070-100 201			□	□	5	70	10	2	0.20	60	6	01
MMV 0500 080-100 201			□	□	5	80	10	2	0.20	60	6	01
MMV 0500 090-100 201			■	■	5	90	10	2	0.30	60	6	01
MMV 0500 120-100 201			□	□	5	120	10	2	0.30	60	6	01
MMV 0550 090-110 201			□	□	5.5	90	11	2	0.30	60	6	01
MMV 0550 120-110 201			□	□	5.5	120	11	2	0.30	60	6	01
MMV 0600 030-120 201			■	■	6	30	12	2	0.20	70	6	01
MMV 0600 045-120 201			■	■	6	45	12	2	0.20	70	6	01
MMV 0600 060-120 201			■	■	6	60	12	2	0.20	60	6	01
MMV 0600 070-120 201			□	□	6	70	12	2	0.20	60	6	01
MMV 0600 080-120 201			□	□	6	80	12	2	0.20	60	6	01
MMV 0600 090-120 201			■	■	6	90	12	2	0.30	60	6	01
MMV 0600 120-120 201			□	□	6	120	12	2	0.30	60	6	01
MMV 0800 090-160 206			■	■	8	90	16	2		70	10	06
MMV 1000 090-180 206			■	■	10	90	18	2		70	12	06
MMV 1200 090-200 206			■	■	12	90	20	2		70	12	06
MMV 1400 090-240 206			□	□	14	90	24	2		80	14	06
MMV 1600 090-260 206			□	□	16	90	26	2		80	16	06
MMV 2000 090-320 206			□	□	20	90	32	2		100	20	06

Die angegebenen Schnittwerte stellen eine generelle Empfehlung dar. Die Werte sollten immer an die jeweilige Bearbeitung, deren Form und die verwendete Maschine angepasst werden.

Ces conditions sont à titre indicatif! En utilisation, optimisez les conditions en fonction de la machine et de la pièce à usiner.

These conditions are for general guidance; in actual machining conditions adjust the parameters according to your actual machine and work-piece conditions.

1. Benutzen Sie für die Bearbeitung jeweils die Maschine mit der höchsten Genauigkeit und der höchsten Stabilität.
2. Bitte die Drehzahl und den Vorschub im gleichen Masse verändern, damit der Zahnvorschub gleich bleibt.
3. Für Werkzeuge mit 4 Zähnen bitte den Vorschub um etwa 30 % erhöhen.

1. Usiner sur une machine précise, fiable et aussi rigide que possible.
2. Conservez des avances et une vitesse de coupe aussi constante que possible.
3. Pour les fraises à Z=4, augmentez l'avance jusqu'à 30 %.

1. Use a highly rigid and accurate machine as possible.
2. Adjust revolution and feed at the same rate in order to keep the feed per tooth.
3. For tools with 4 teeth please increase the feed by approximately 30 %.

Bei langen Schneiden oder lang auskragenden Werkzeugen bitte wie folgt korrigieren:

Pour les fraises à longue capacité de plongée, utilisez les informations ci-dessous.

For tools with long cutting edges or long overhang please adjust accordingly:

Ausraglänge ($l/l_1 \geq 5 \times D$):

- Drehzahl (n) 100 %
- Vorschub (v_f) 90 %
- Schnitttiefe (a_p) 75 %

Longeur utile ($l/l_1 \geq 5 \times D$):

- Nombre de tours (n) 100 %
- Avance (v_f) 90 %
- Profondeur de passe (a_p) 75 %

Overhang (l/l_1) measures $\geq 5 \times D$:

- Speed (n) 100 %
- Feed (v_f) 90 %
- cutting depth (a_p) 75 %

Ausraglänge ($l/l_1 \geq 10 \times D$):

- Drehzahl (n) 90 %
- Vorschub (v_f) 70 %
- Schnitttiefe (a_p) 50 %

Longeur utile ($l/l_1 \geq 10 \times D$):

- Nombre de tours (n) 90 %
- Avance (v_f) 70 %
- Profondeur de passe (a_p) 50 %

Overhang (l/l_1) measures $\geq 10 \times D$:

- Speed (n) 90 %
- Feed (v_f) 70 %
- cutting depth (a_p) 50 %

Ausraglänge ($l/l_1 \geq 20 \times D$):

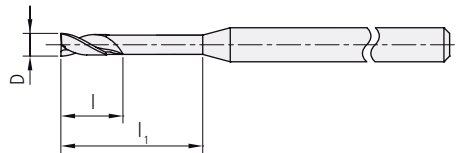
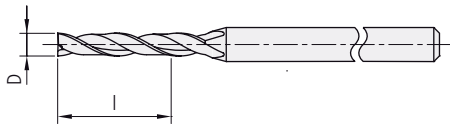
- Drehzahl (n) 80 %
- Vorschub (v_f) 50 %
- Schnitttiefe (a_p) 25 %

Longeur utile ($l/l_1 \geq 20 \times D$):

- Nombre de tours (n) 80 %
- Avance (v_f) 50 %
- Profondeur de passe (a_p) 25 %

Overhang (l/l_1) measures $\geq 20 \times D$:

- Speed (n) 80 %
- Feed (v_f) 50 %
- cutting depth (a_p) 25 %



Nutenfräsen Typ 01 | Rainures Type 01 | Slotting Typ 01

UHM 20 ▼▼	Stahl unlegiert Acier non allié Steel unalloyed (I)		Stahl niedriglegiert Acier faibl. allié Steel low alloyed (II)		Stahl hochlegiert Acier fortem. allié Steel high alloyed (III)		Rostfreier Stahl Acier inoxydable Stainless steel (V)		Rostfreier Stahl Acier inoxydable Stainless steel (VI)	
	Drehzahlen (n) und Vorschübe (v _f) Nombre de tours (n) et avances (v _f) Speeds (n) and feeds (v _f)									
D (mm)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)
0.1	32'000	15	32'000	15	—	—	—	—	—	—
0.2	32'000	30	32'000	25	—	—	—	—	—	—
0.3	31'500	45	30'000	30	—	—	—	—	—	—
0.4	26'500	50	21'600	33	—	—	—	—	—	—
0.5	20'000	50	17'000	33	—	—	—	—	—	—
0.6	17'000	53	15'000	33	—	—	—	—	—	—
0.7	15'500	57	13'250	34	—	—	—	—	—	—
0.8	14'000	60	11'500	35	—	—	—	—	—	—
0.9	12'500	75	10'500	40	—	—	—	—	—	—
1	11'000	85	9'000	40	—	—	—	—	—	—
1.1	10'500	85	8'600	40	—	—	—	—	—	—
1.2	9'800	85	8'300	40	—	—	—	—	—	—
1.3	9'100	85	7'700	45	—	—	—	—	—	—
1.4	8'500	85	7'200	45	—	—	—	—	—	—
1.5	7'500	90	6'400	45	—	—	—	—	—	—
1.6	7'250	93	6'200	48	—	—	—	—	—	—
1.7	7'000	95	6'000	50	—	—	—	—	—	—
1.8	6'400	100	5'400	55	—	—	—	—	—	—
1.9	6'100	100	5'150	58	—	—	—	—	—	—
2	5'800	100	4'900	60	—	—	—	—	—	—
2.1	5'550	100	4'700	63	—	—	—	—	—	—
2.2	5'300	100	4'500	65	—	—	—	—	—	—
2.3	5'100	100	4'350	65	—	—	—	—	—	—
2.4	4'900	100	4'200	65	—	—	—	—	—	—
2.5	4'700	100	4'050	68	—	—	—	—	—	—
2.6	4'500	100	3'900	70	—	—	—	—	—	—
2.7	4'350	100	3'750	73	—	—	—	—	—	—
2.8	4'200	100	3'600	75	—	—	—	—	—	—
2.9	3'900	100	3'300	78	—	—	—	—	—	—
3	3'600	100	3'000	80	—	—	—	—	—	—
3.5	3'200	100	2'700	80	—	—	—	—	—	—
4	2'800	100	2'400	80	—	—	—	—	—	—
4.5	2'500	100	2'200	80	—	—	—	—	—	—
5	2'250	100	2'000	80	—	—	—	—	—	—
6	2'100	100	1'800	80	—	—	—	—	—	—

D (mm)	Schnitttiefen (a _p) und Zustellung (a _e) Profondeurs de passes (a _p) et déplacement (a _e) Depths of cut (a _p) and width of cut (a _e)									
	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)
	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)
< 0.2	0.08 × D	1 × D	0.08 × D	1 × D	—	—	—	—	—	—
< 1	0.1 × D	1 × D	0.1 × D	1 × D	—	—	—	—	—	—
≥ 1	0.3 × D	1 × D	0.3 × D	1 × D	—	—	—	—	—	—

Nutenfräsen Typ 01 beschichtet | Rainures Type 01 revêtus | Slotting Typ 01 coated

UHM 20 HX	Stahl unlegiert Acier non allié Steel unalloyed		Stahl niedriglegiert Acier faibl. allié Steel low alloyed		Stahl hochlegiert Acier fortem. allié Steel high alloyed		Rostfreier Stahl Acier inoxydable Stainless steel		Rostfreier Stahl Acier inoxydable Stainless steel	
	▼▼	(I)	(II)		(III)		(V)	(VI)		
	Drehzahlen (n) und Vorschübe (v _f) Nombre de tours (n) et avances (v _f) Speeds (n) and feeds (v _f)									
D (mm)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)
0.1	32'000	60	32'000	70	32'000	48	32'000	48	25'600	33
0.2	32'000	65	32'000	75	32'000	53	32'000	53	25'600	37
0.3	32'000	83	32'000	88	31'500	63	31'500	63	25'200	44
0.4	32'000	95	31'500	95	24'000	73	24'000	73	19'200	51
0.5	28'750	120	22'750	115	17'750	90	17'750	90	14'200	63
0.6	26'250	130	19'875	115	16'000	90	16'000	90	12'800	63
0.7	24'350	130	17'750	115	13'500	90	13'500	90	10'800	63
0.8	22'000	135	16'250	123	13'000	93	13'000	93	10'400	65
0.9	20'000	135	14'600	123	11'750	93	11'750	93	9'400	65
1	17'200	140	13'200	133	10'650	93	10'650	93	8'520	65
1.1	15'900	140	12'200	133	9'850	95	9'850	95	7'880	67
1.2	14'700	150	11'300	133	9'150	95	9'150	95	7'320	67
1.3	13'650	150	10'550	133	8'475	95	8'475	95	6'780	67
1.4	12'650	155	9'750	133	7'850	95	7'850	95	6'280	67
1.5	12'000	155	9'325	133	7'450	95	7'450	95	5'960	67
1.6	11'500	160	8'900	135	7'100	95	7'100	95	5'680	67
1.7	10'900	160	8'475	135	6'775	95	6'775	95	5'420	67
1.8	10'400	160	8'050	138	6'450	95	6'450	95	5'160	67
1.9	9'950	160	7'725	138	6'150	95	6'150	95	4'920	67
2	9'500	188	7'350	145	5'850	95	5'850	95	4'680	67
2.1	9'000	188	7'075	145	5'650	95	5'650	95	4'520	67
2.2	8'600	190	6'850	148	5'450	95	5'450	95	4'360	67
2.3	8'200	193	6'575	148	5'250	95	5'250	95	4'200	67
2.4	7'800	198	6'350	160	5'050	103	5'050	103	4'040	72
2.5	7'400	200	6'125	160	4'900	103	4'900	103	3'920	72
2.6	7'050	203	5'900	160	4'700	103	4'700	103	3'760	72
2.7	6'800	205	5'663	163	4'525	103	4'525	103	3'620	72
2.8	6'550	215	5'425	168	4'350	108	4'350	108	3'480	75
2.9	6'325	218	5'060	168	3'795	108	3'795	108	3'036	75
3	6'095	220	4'830	168	3'680	108	3'680	108	2'944	75
3.5	5'175	235	4'140	183	3'105	118	3'105	118	2'484	82
4	4'600	235	3'680	183	2'645	120	2'645	120	2'116	84
4.5	4'025	260	3'220	203	2'415	130	2'415	130	1'932	91
5	3'680	260	2'875	203	2'185	130	2'185	130	1'748	91
6	2'990	260	2'415	203	1'840	130	1'840	130	1'472	91

D (mm)	Schnitttiefen (a _p) und Zustellung (a _e) Profondeurs de passes (a _p) et déplacement (a _e) Depths of cut (a _p) and width of cut (a _e)									
	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)
< 0.2	0.08 × D	1 × D	0.08 × D	1 × D	0.08 × D	1 × D	0.08 × D	1 × D	0.08 × D	1 × D
< 1	0.1 × D	1 × D	0.1 × D	1 × D	0.1 × D	1 × D	0.1 × D	1 × D	0.1 × D	1 × D
≥ 1	0.3 × D	1 × D	0.3 × D	1 × D	0.3 × D	1 × D	0.3 × D	1 × D	0.3 × D	1 × D

Seitenfräsen Typ 01 | Contours Type 01 | Edge cutting Typ 01

UHM 20 ▼▼	Stahl unlegiert Acier non allié Steel unalloyed (I)		Stahl niedriglegiert Acier faibl. allié Steel low alloyed (II)		Stahl hochlegiert Acier fortem. allié Steel high alloyed (III)		Rostfreier Stahl Acier inoxydable Stainless steel (V)		Rostfreier Stahl Acier inoxydable Stainless steel (VI)	
	Drehzahlen (n) und Vorschübe (v _f) Nombre de tours (n) et avances (v _f) Speeds (n) and feeds (v _f)									
D (mm)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)
0.1	32'000	15	32'000	15	30'000	15	—	—	—	—
0.2	25'000	18	25'000	18	24'000	15	—	—	—	—
0.3	17'500	21	17'500	21	17'000	18	—	—	—	—
0.4	14'500	24	14'500	24	14'000	20	—	—	—	—
0.5	13'000	25	13'000	25	12'000	20	—	—	—	—
0.6	11'300	28	11'300	28	10'000	20	—	—	—	—
0.7	9'600	30	9'600	30	8'700	20	—	—	—	—
0.8	8'550	35	8'550	35	7'400	20	—	—	—	—
0.9	7'500	40	7'500	40	6'600	22.5	—	—	—	—
1	6'850	40	6'850	40	5'800	25	—	—	—	—
1.1	6'200	40	6'200	40	5'300	25	—	—	—	—
1.2	5'750	40	5'750	40	4'800	25	—	—	—	—
1.3	5'300	40	5'300	40	4'450	27.5	—	—	—	—
1.4	4'950	40	4'950	40	4'100	30	—	—	—	—
1.5	4'600	40	4'600	40	3'850	30	—	—	—	—
1.6	4'350	40	4'350	40	3'600	30	—	—	—	—
1.7	4'100	40	4'100	40	3'400	30	—	—	—	—
1.8	3'900	40	3'900	40	3'200	30	—	—	—	—
1.9	3'700	40	3'700	40	3'000	30	—	—	—	—
2	3'500	45	3'500	45	2'800	30	—	—	—	—
2.1	3'300	50	3'300	50	2'700	32.5	—	—	—	—
2.2	3'150	50	3'150	50	2'600	35	—	—	—	—
2.3	3'000	50	3'000	50	2'500	35	—	—	—	—
2.4	2'900	53	2'900	53	2'400	35	—	—	—	—
2.5	2'800	55	2'800	55	2'300	37.5	—	—	—	—
2.6	2'700	55	2'700	55	2'200	40	—	—	—	—
2.7	2'600	55	2'600	55	2'100	40	—	—	—	—
2.8	2'550	55	2'550	55	2'000	40	—	—	—	—
2.9	2'500	55	2'500	55	1'950	40	—	—	—	—
3	2'100	55	2'000	55	1'900	40	—	—	—	—
3.5	1'750	55	1'550	50	1'600	40	—	—	—	—
4	1'550	55	1'400	50	1'250	40	—	—	—	—
4.5	1'400	55	1'250	50	1'100	40	—	—	—	—
5	1'200	55	1'150	50	1'000	40	—	—	—	—
6	1'100	55	1'050	50	845	40	—	—	—	—

D (mm)	Schnitttiefen (a _p) und Zustellung (a _e) Profondeurs de passes (a _p) et déplacement (a _e) Depths of cut (a _p) and width of cut (a _e)									
	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)
	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)
< 0.2	0.4 × D	0.05 × D	0.4 × D	0.05 × D	—	—	—	—	—	—
< 1	0.4 × D	0.1 × D	0.4 × D	0.1 × D	—	—	—	—	—	—
≥ 1	0.8 × D	0.1 × D	0.8 × D	0.1 × D	—	—	—	—	—	—

300

Seitenfräsen Typ 01 beschichtet | Contours Type 01 revêtus | Edge cutting Typ 01 coated

UHM 20 HX	Stahl unlegiert Acier non allié Steel unalloyed (I)		Stahl niedriglegiert Acier faibl. allié Steel low alloyed (II)		Stahl hochlegiert Acier fortem. allié Steel high alloyed (III)		Rostfreier Stahl Acier inoxydable Stainless steel (V)		Rostfreier Stahl Acier inoxydable Stainless steel (VI)	
	Drehzahlen (n) und Vorschübe (v _f) Nombre de tours (n) et avances (v _f) Speeds (n) and feeds (v _f)									
D (mm)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)
0.1	41'600	24	38'400	24	36'000	24	36'000	24	28'800	17
0.2	32'500	29	30'000	29	28'800	24	28'800	24	23'040	17
0.3	22'750	34	21'000	34	20'400	28	20'400	28	16'320	20
0.4	18'850	38	17'400	38	16'800	32	16'800	32	13'440	22
0.5	16'900	40	15'600	40	14'400	32	14'400	32	11'520	22
0.6	14'690	44	13'560	44	12'000	32	12'000	32	9'600	22
0.7	12'480	48	11'520	48	10'440	32	10'440	32	8'352	22
0.8	11'115	56	10'260	56	8'880	32	8'880	32	7'104	22
0.9	9'750	64	9'000	64	7'920	36	7'920	36	6'336	25
1	8'905	64	8'220	64	6'960	40	6'960	40	5'568	28
1.1	8'060	64	7'440	64	6'360	40	6'360	40	5'088	28
1.2	7'475	64	6'900	64	5'760	40	5'760	40	4'608	28
1.3	6'890	64	6'360	64	5'340	44	5'340	44	4'272	31
1.4	6'435	64	5'940	64	4'920	48	4'920	48	3'936	34
1.5	5'980	64	5'520	64	4'620	48	4'620	48	3'696	34
1.6	5'655	64	5'220	64	4'320	48	4'320	48	3'456	34
1.7	5'330	64	4'920	64	4'080	48	4'080	48	3'264	34
1.8	5'070	64	4'680	64	3'840	48	3'840	48	3'072	34
1.9	4'810	64	4'440	64	3'600	48	3'600	48	2'880	34
2	4'550	72	4'200	72	3'360	48	3'360	48	2'688	34
2.1	4'290	80	3'960	80	3'240	52	3'240	52	2'592	36
2.2	4'095	80	3'780	80	3'120	56	3'120	56	2'496	39
2.3	3'900	80	3'600	80	3'000	56	3'000	56	2'400	39
2.4	3'770	84	3'480	84	2'880	56	2'880	56	2'304	39
2.5	3'640	88	3'360	88	2'760	60	2'760	60	2'208	42
2.6	3'510	88	3'240	88	2'640	64	2'640	64	2'112	45
2.7	3'380	88	3'120	88	2'520	64	2'520	64	2'016	45
2.8	3'315	88	3'060	88	2'400	64	2'400	64	1'920	45
2.9	3'250	88	3'000	88	2'340	64	2'340	64	1'872	45
3	2'730	88	2'400	88	2'280	64	2'280	64	1'824	45
3.5	2'275	88	1'860	80	1'920	64	1'920	64	1'536	45
4	2'015	88	1'680	80	1'500	64	1'500	64	1'200	45
4.5	1'820	88	1'500	80	1'320	64	1'320	64	1'056	45
5	1'560	88	1'380	80	1'200	64	1'200	64	960	45
6	1'430	88	1'260	80	1'014	64	1'014	64	811	45

D (mm)	Schnitttiefen (a _p) und Zustellung (a _e) Profondeurs de passes (a _p) et déplacement (a _e) Depths of cut (a _p) and width of cut (a _e)									
	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)
< 0.2	0.4 × D	0.05 × D	0.4 × D	0.05 × D	0.4 × D	0.05 × D	0.4 × D	0.05 × D	0.4 × D	0.05 × D
< 1	0.4 × D	0.1 × D	0.4 × D	0.1 × D	0.4 × D	0.1 × D	0.4 × D	0.1 × D	0.4 × D	0.1 × D
≥ 1	0.8 × D	0.1 × D	0.8 × D	0.1 × D	0.8 × D	0.1 × D	0.8 × D	0.1 × D	0.8 × D	0.1 × D

Nutenfräsen Typ 02 | Rainures Type 02 | Slotting Typ 02

UHM 20 ▼▼	Stahl unlegiert Acier non allié Steel unalloyed (I)		Stahl niedriglegiert Acier faibl. allié Steel low alloyed (II)		Stahl hochlegiert Acier fortem. allié Steel high alloyed (III)		Rostfreier Stahl Acier inoxydable Stainless steel (V)		Rostfreier Stahl Acier inoxydable Stainless steel (VI)	
	Drehzahlen (n) und Vorschübe (v _f) Nombre de tours (n) et avances (v _f) Speeds (n) and feeds (v _f)									
D (mm)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)
0.2	32'000	15-30	32'000	15-30	—	—	—	—	—	—
0.3	32'000	20-50	32'000	20-50	—	—	—	—	—	—
0.4	32'000	50-120	31'500	50-120	—	—	—	—	—	—
0.5	32'000	140-250	25'500	140-250	—	—	—	—	—	—
0.6	26'500	160-300	21'000	160-300	—	—	—	—	—	—
0.7	22'500	160-350	18'000	160-350	—	—	—	—	—	—
0.8	20'000	160-400	15'900	160-400	—	—	—	—	—	—
0.9	17'500	180-450	14'000	180-450	—	—	—	—	—	—
1	16'000	180-500	12'700	180-500	—	—	—	—	—	—
1.1	14'000	180-500	11'600	180-500	—	—	—	—	—	—
1.2	12'800	180-500	10'500	180-500	—	—	—	—	—	—
1.3	12'000	180-500	9'800	180-500	—	—	—	—	—	—
1.4	11'000	180-500	9'000	180-500	—	—	—	—	—	—
1.5	10'500	200-600	8'400	200-600	—	—	—	—	—	—
1.6	10'000	200-600	7'900	200-600	—	—	—	—	—	—
1.7	9'500	200-600	7'500	200-600	—	—	—	—	—	—
1.8	9'000	200-600	7'000	200-600	—	—	—	—	—	—
1.9	8'500	200-600	6'700	200-600	—	—	—	—	—	—
2	8'000	200-600	6'400	200-600	—	—	—	—	—	—
2.1	7'700	200-600	6'000	200-600	—	—	—	—	—	—
2.2	7'400	200-600	5'800	200-600	—	—	—	—	—	—
2.3	7'200	200-600	5'600	200-600	—	—	—	—	—	—
2.4	6'800	200-600	5'400	200-600	—	—	—	—	—	—
2.5	6'500	200-600	5'200	200-600	—	—	—	—	—	—
2.6	6'200	200-600	4'900	200-600	—	—	—	—	—	—
2.7	5'800	200-600	4'600	200-600	—	—	—	—	—	—
2.8	5'500	200-600	4'400	200-600	—	—	—	—	—	—
2.9	5'200	200-600	4'300	200-600	—	—	—	—	—	—
3	5'000	200-600	4'200	200-600	—	—	—	—	—	—
3.5	4'500	200-600	3'600	200-600	—	—	—	—	—	—
4	4'200	150-500	3'300	150-500	—	—	—	—	—	—
4.5	4'000	150-500	3'200	150-500	—	—	—	—	—	—
5	3'600	150-500	2'800	150-500	—	—	—	—	—	—
6	3'200	150-500	2'500	150-500	—	—	—	—	—	—

D (mm)	Schnitttiefen (a _p) und Zustellung (a _e) Profondeurs de passes (a _p) et déplacement (a _e) Depths of cut (a _p) and width of cut (a _e)									
	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)
≤ 0.2	0.003-0.006	1 × D	0.003-0.006	1 × D	—	—	—	—	—	—
≤ 0.3	0.003-0.009	1 × D	0.003-0.009	1 × D	—	—	—	—	—	—
≤ 0.4	0.003-0.012	1 × D	0.003-0.012	1 × D	—	—	—	—	—	—
≤ 0.5	0.003-0.018	1 × D	0.003-0.018	1 × D	—	—	—	—	—	—
≤ 0.6	0.006-0.025	1 × D	0.006-0.025	1 × D	—	—	—	—	—	—
≤ 0.7	0.02-0.04	1 × D	0.02-0.04	1 × D	—	—	—	—	—	—
≤ 1	0.02-0.05	1 × D	0.02-0.05	1 × D	—	—	—	—	—	—
≤ 1.4	0.02-0.08	1 × D	0.02-0.08	1 × D	—	—	—	—	—	—
≤ 1.5	0.03-0.10	1 × D	0.03-0.10	1 × D	—	—	—	—	—	—
≤ 1.9	0.03-0.12	1 × D	0.03-0.12	1 × D	—	—	—	—	—	—
≤ 2.4	0.05-0.15	1 × D	0.05-0.15	1 × D	—	—	—	—	—	—
≤ 2.9	0.05-0.2	1 × D	0.05-0.2	1 × D	—	—	—	—	—	—
≤ 3.4	0.05-0.25	1 × D	0.05-0.25	1 × D	—	—	—	—	—	—
≤ 3.9	0.05-0.3	1 × D	0.05-0.3	1 × D	—	—	—	—	—	—
≤ 4.9	0.05-0.4	1 × D	0.05-0.4	1 × D	—	—	—	—	—	—
≤ 6	0.05-0.5	1 × D	0.05-0.5	1 × D	—	—	—	—	—	—

Nutenfräsen Typ 02 beschichtet | Rainures Type 02 revêtus | Slotting Typ 02 coated

UHM 20 HX ▼▼	Stahl unlegiert Acier non allié Steel unalloyed (I)		Stahl niedriglegiert Acier faibl. allié Steel low alloyed (II)		Stahl hochlegiert Acier fortem. allié Steel high alloyed (III)		Rostfreier Stahl Acier inoxydable Stainless steel (V)		Rostfreier Stahl Acier inoxydable Stainless steel (VI)	
	Drehzahlen (n) und Vorschübe (v _f) Nombre de tours (n) et avances (v _f) Speeds (n) and feeds (v _f)									
D (mm)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)
0.2	40'000	21-42	38'400	22-45	38'400	22-45	38'400	22-45	30'720	18-36
0.3	40'000	26-65	38'400	30-75	37'200	30-75	37'200	30-75	29'760	21-52
0.4	40'000	65-156	37'800	75-180	26'400	75-180	26'400	75-180	21'120	52-126
0.5	40'000	182-325	30'600	210-375	21'600	210-375	21'600	210-375	17'280	147-262
0.6	33'125	208-390	25'200	240-450	18'000	240-450	18'000	240-450	14'400	168-315
0.7	28'125	208-455	21'600	240-525	16'200	240-525	16'200	240-525	12'960	168-368
0.8	25'000	208-520	19'080	240-600	13'800	240-600	13'800	240-600	11'040	168-420
0.9	21'875	234-585	16'800	270-675	12'600	270-675	12'600	270-675	10'080	189-472
1	20'000	234-650	15'240	270-750	11'460	270-750	11'460	270-750	9'168	189-525
1.1	17'500	234-650	13'920	270-750	10'800	270-750	10'800	270-750	8'640	189-525
1.2	16'000	234-650	12'600	270-750	10'200	270-750	10'200	270-750	8'160	189-525
1.3	15'000	234-650	11'760	270-750	9'000	270-750	9'000	270-750	7'200	189-525
1.4	13'750	234-650	10'800	270-750	8'160	270-750	8'160	270-750	6'528	189-525
1.5	13'125	260-780	10'080	300-900	7'200	300-900	7'200	300-900	5'760	210-630
1.6	12'500	260-780	9'480	300-900	6'840	300-900	6'840	300-900	5'472	210-630
1.7	11'875	260-780	9'000	300-900	6'480	300-900	6'480	300-900	5'184	210-630
1.8	11'250	260-780	8'400	300-900	6'120	300-900	6'120	300-900	4'896	210-630
1.9	10'625	260-780	8'040	300-900	5'880	300-900	5'880	300-900	4'704	210-630
2	10'000	260-780	7'680	300-900	5'760	300-900	5'760	300-900	4'608	210-630
2.1	9'625	260-780	7'200	300-900	5'520	300-900	5'520	300-900	4'416	210-630
2.2	9'250	260-780	6'960	300-900	5'280	300-900	5'280	300-900	4'224	210-630
2.3	9'000	260-780	6'720	300-900	5'040	300-900	5'040	300-900	4'032	210-630
2.4	8'500	260-780	6'480	300-900	4'800	300-900	4'800	300-900	3'840	210-630
2.5	8'125	260-780	6'240	300-900	4'560	300-900	4'560	300-900	3'648	210-630
2.6	7'750	260-780	5'880	300-900	4'380	300-900	4'380	300-900	3'504	210-630
2.7	7'250	260-780	5'520	300-900	4'200	300-900	4'200	300-900	3'360	210-630
2.8	6'875	260-780	5'280	300-900	4'080	300-900	4'080	300-900	3'264	210-630
2.9	6'500	260-780	5'160	300-900	3'960	300-900	3'960	300-900	3'168	210-630
3	6'250	260-780	5'040	300-900	3'780	300-900	3'780	300-900	3'024	210-630
3.5	5'625	260-780	4'320	300-900	3'360	300-900	3'360	300-900	2'688	210-630
4	5'250	195-650	3'960	225-750	3'000	225-750	3'000	225-750	2'400	157-525
4.5	5'000	195-650	3'840	225-750	2'880	225-750	2'880	225-750	2'304	157-526
5	4'500	195-650	3'360	225-750	2'520	225-750	2'520	225-750	2'016	157-527
6	4'000	195-650	3'000	225-750	2'400	225-750	2'400	225-750	1'920	157-528

D (mm)	Schnitttiefen (a _p) und Zustellung (a _e) Profondeurs de passes (a _p) et déplacement (a _e) Depths of cut (a _p) and width of cut (a _e)									
	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)
≤ 0.2	0.003-0.006	1 × D	0.003-0.006	1 × D	0.003-0.006	1 × D	0.003-0.006	1 × D	0.003-0.006	1 × D
≤ 0.3	0.003-0.009	1 × D	0.003-0.009	1 × D	0.003-0.009	1 × D	0.003-0.009	1 × D	0.003-0.009	1 × D
≤ 0.4	0.003-0.012	1 × D	0.003-0.012	1 × D	0.003-0.012	1 × D	0.003-0.012	1 × D	0.003-0.012	1 × D
≤ 0.5	0.003-0.018	1 × D	0.003-0.018	1 × D	0.003-0.018	1 × D	0.003-0.018	1 × D	0.003-0.018	1 × D
≤ 0.6	0.006-0.025	1 × D	0.006-0.025	1 × D	0.006-0.025	1 × D	0.006-0.025	1 × D	0.006-0.025	1 × D
≤ 0.7	0.02-0.04	1 × D	0.02-0.04	1 × D	0.02-0.04	1 × D	0.02-0.04	1 × D	0.02-0.04	1 × D
≤ 1	0.02-0.05	1 × D	0.02-0.05	1 × D	0.02-0.05	1 × D	0.02-0.05	1 × D	0.02-0.05	1 × D
≤ 1.4	0.02-0.08	1 × D	0.02-0.08	1 × D	0.02-0.08	1 × D	0.02-0.08	1 × D	0.02-0.08	1 × D
≤ 1.5	0.03-0.10	1 × D	0.03-0.10	1 × D	0.03-0.10	1 × D	0.03-0.10	1 × D	0.03-0.10	1 × D
≤ 1.9	0.03-0.12	1 × D	0.03-0.12	1 × D	0.03-0.12	1 × D	0.03-0.12	1 × D	0.03-0.12	1 × D
≤ 2.4	0.05-0.15	1 × D	0.05-0.15	1 × D	0.05-0.15	1 × D	0.05-0.15	1 × D	0.05-0.15	1 × D
≤ 2.9	0.05-0.2	1 × D	0.05-0.2	1 × D	0.05-0.2	1 × D	0.05-0.2	1 × D	0.05-0.2	1 × D
≤ 3.4	0.05-0.25	1 × D	0.05-0.25	1 × D	0.05-0.25	1 × D	0.05-0.25	1 × D	0.05-0.25	1 × D
≤ 3.9	0.05-0.3	1 × D	0.05-0.3	1 × D	0.05-0.3	1 × D	0.05-0.3	1 × D	0.05-0.3	1 × D
≤ 4.9	0.05-0.4	1 × D	0.05-0.4	1 × D	0.05-0.4	1 × D	0.05-0.4	1 × D	0.05-0.4	1 × D
≤ 6	0.05-0.5	1 × D	0.05-0.5	1 × D	0.05-0.5	1 × D	0.05-0.5	1 × D	0.05-0.5	1 × D

Nutenfräsen Typ 03 | Rainures Type 03 | Slotting Typ 03

UHM 10 ▼▼	Stahl unlegiert Acier non allié Steel unalloyed (I)		Stahl niedriglegiert Acier faibl. allié Steel low alloyed (II)		Stahl hochlegiert Acier fortem. allié Steel high alloyed (III)		Rostfreier Stahl Acier inoxydable Stainless steel (V)		Rostfreier Stahl Acier inoxydable Stainless steel (VI)	
	Drehzahlen (n) und Vorschübe (v _f) Nombre de tours (n) et avances (v _f) Speeds (n) and feeds (v _f)									
D (mm)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)
0.2	—	—	—	—	—	—	—	—	—	—
0.3	—	—	—	—	—	—	—	—	—	—
0.4	—	—	—	—	—	—	—	—	—	—
0.5	—	—	—	—	—	—	—	—	—	—
0.6	—	—	—	—	—	—	—	—	—	—
0.7	—	—	—	—	—	—	—	—	—	—
0.8	—	—	—	—	—	—	—	—	—	—
0.9	—	—	—	—	—	—	—	—	—	—
1	—	—	—	—	—	—	—	—	—	—
1.1	—	—	—	—	—	—	—	—	—	—
1.2	—	—	—	—	—	—	—	—	—	—
1.3	—	—	—	—	—	—	—	—	—	—
1.4	—	—	—	—	—	—	—	—	—	—
1.5	—	—	—	—	—	—	—	—	—	—
1.6	—	—	—	—	—	—	—	—	—	—
1.7	—	—	—	—	—	—	—	—	—	—
1.8	—	—	—	—	—	—	—	—	—	—
1.9	—	—	—	—	—	—	—	—	—	—
2	—	—	—	—	—	—	—	—	—	—
2.1	—	—	—	—	—	—	—	—	—	—
2.2	—	—	—	—	—	—	—	—	—	—
2.3	—	—	—	—	—	—	—	—	—	—
2.4	—	—	—	—	—	—	—	—	—	—
2.5	—	—	—	—	—	—	—	—	—	—
2.6	—	—	—	—	—	—	—	—	—	—
2.7	—	—	—	—	—	—	—	—	—	—
2.8	—	—	—	—	—	—	—	—	—	—
2.9	—	—	—	—	—	—	—	—	—	—
3	—	—	—	—	—	—	—	—	—	—
3.5	—	—	—	—	—	—	—	—	—	—
4	—	—	—	—	—	—	—	—	—	—
4.5	—	—	—	—	—	—	—	—	—	—
5	—	—	—	—	—	—	—	—	—	—
6	—	—	—	—	—	—	—	—	—	—

D (mm)	Schnitttiefen (a _p) und Zustellung (a _e) Profondeurs de passes (a _p) et déplacement (a _e) Depths of cut (a _p) and width of cut (a _e)									
	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)
≤ 0.2	—	—	—	—	—	—	—	—	—	—
≤ 0.3	—	—	—	—	—	—	—	—	—	—
≤ 0.4	—	—	—	—	—	—	—	—	—	—
≤ 0.5	—	—	—	—	—	—	—	—	—	—
≤ 0.6	—	—	—	—	—	—	—	—	—	—
≤ 0.7	—	—	—	—	—	—	—	—	—	—
≤ 0.8	—	—	—	—	—	—	—	—	—	—
≤ 0.9	—	—	—	—	—	—	—	—	—	—
≤ 1	—	—	—	—	—	—	—	—	—	—
≤ 1.2	—	—	—	—	—	—	—	—	—	—
≤ 1.5	—	—	—	—	—	—	—	—	—	—
≤ 2	—	—	—	—	—	—	—	—	—	—
≤ 2.5	—	—	—	—	—	—	—	—	—	—
≤ 3	—	—	—	—	—	—	—	—	—	—
≤ 4	—	—	—	—	—	—	—	—	—	—
≤ 5	—	—	—	—	—	—	—	—	—	—
≤ 6	—	—	—	—	—	—	—	—	—	—

Nutenfräsen Typ 03 | Rainures Type 03 | Slotting Typ 03

UHM 10	Titan Titane Titanium		Aluminium Aluminium Aluminium		Messing Laiton Brass		Kunststoff/Harz Matière synthétique/résine Synthetics/resin	
	Drehzahlen (n) und Vorschübe (v _f) Nombre de tours (n) et avances (v _f) Speeds (n) and feeds (v _f)							
D (mm)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)
0.2	23'296	85-104	32'000	130-160	32'000	117-128	32'000	250-260
0.3	23'296	85-118	32'000	130-180	32'000	104-144	32'000	250-280
0.4	23'296	85-131	32'000	130-200	32'000	104-160	32'000	250-280
0.5	23'296	104-131	32'000	160-200	32'000	128-160	31'500	250-320
0.6	23'296	131-158	32'000	200-240	32'000	160-192	26'500	280-350
0.7	23'296	158-170	32'000	240-260	32'000	192-208	22'700	280-350
0.8	23'296	210-230	32'000	320-350	32'000	256-280	20'000	300-420
0.9	18'200	210-249	25'000	320-380	25'000	256-304	18'000	320-450
1	16'380	262-315	22'500	400-480	22'500	320-384	16'000	350-500
1.1	15'652	275-328	21'500	420-500	21'500	336-400	14'500	350-500
1.2	15'288	295-393	21'000	450-600	21'000	360-480	13'200	360-600
1.3	13'832	295-393	19'000	450-600	19'000	360-480	11'900	360-600
1.4	12'376	295-393	17'000	450-600	17'000	360-480	11'200	360-600
1.5	11'648	295-426	16'000	450-650	16'000	360-520	10'500	320-700
1.6	10'920	295-426	15'000	450-650	15'000	360-520	9'700	320-700
1.7	10'192	295-426	14'000	450-650	14'000	360-520	9'300	320-700
1.8	9'464	295-459	13'000	450-700	13'000	360-560	8'800	320-700
1.9	9'100	295-524	12'500	450-800	12'500	360-640	8'400	320-700
2	8'736	328-643	12'000	500-980	12'000	400-784	8'000	320-700
2.1	8'372	328-643	11'500	500-980	11'500	400-784	7'500	320-700
2.2	8'008	328-644	11'000	500-980	11'000	400-784	7'100	320-700
2.3	7'644	328-589	10'500	500-900	10'500	400-720	6'800	320-700
2.4	7'280	328-589	10'000	500-900	10'000	400-720	6'500	320-700
2.5	6'916	328-589	9'500	500-900	9'500	400-720	6'300	320-750
2.6	6'698	328-589	9'200	500-900	9'200	400-720	6'000	320-750
2.7	6'479	328-589	8'900	500-900	8'900	400-720	5'800	320-750
2.8	6'188	393-589	8'500	600-900	8'500	480-720	5'600	320-750
2.9	5'970	393-589	8'200	600-900	8'200	480-720	5'400	320-750
3	5'824	393-589	8'000	600-900	8'000	480-720	5'300	300-800
3.5	4'950	361-524	6'800	550-800	6'800	440-640	4'500	300-800
4	4'368	328-498	6'000	500-760	6'000	400-608	4'000	220-700
4.5	3'858	295-459	5'300	450-700	5'300	360-560	3'500	220-700
5	3'494	295-432	4'800	450-660	4'800	360-528	3'200	160-600
6	2'912	262-378	4'000	400-580	4'000	320-464	2'600	140-500

Schnitttiefen (a _p) und Zustellung (a _e) Profondeurs de passes (a _p) et déplacement (a _e) Depths of cut (a _p) and width of cut (a _e)								
D (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)
≤ 0.2	0.05	0.05-1 × D	0.05	0.05-1 × D	0.05	0.05-1 × D	0.1	0.05-1 × D
≤ 0.3	0.07	0.05-1 × D	0.07	0.05-1 × D	0.07	0.05-1 × D	0.2	0.05-1 × D
≤ 0.4	0.1	0.05-1 × D	0.1	0.05-1 × D	0.1	0.05-1 × D	0.3	0.05-1 × D
≤ 0.5	0.12	0.1-1 × D	0.12	0.1-1 × D	0.12	0.1-1 × D	0.4	0.1-1 × D
≤ 0.6	0.15	0.1-1 × D	0.15	0.1-1 × D	0.15	0.1-1 × D	0.5	0.1-1 × D
≤ 0.7	0.17	0.1-1 × D	0.17	0.1-1 × D	0.17	0.1-1 × D	0.6	0.1-1 × D
≤ 0.8	0.2	0.1-1 × D	0.2	0.1-1 × D	0.2	0.1-1 × D	0.6	0.1-1 × D
≤ 0.9	0.22	0.1-1 × D	0.22	0.1-1 × D	0.22	0.1-1 × D	0.7	0.1-1 × D
≤ 1	0.5	0.1-1 × D	0.5	0.1-1 × D	0.5	0.1-1 × D	0.8	0.1-1 × D
≤ 1.2	0.6	0.1-1 × D	0.6	0.1-1 × D	0.6	0.1-1 × D	1	0.1-1 × D
≤ 1.5	0.7	0.1-1 × D	0.7	0.1-1 × D	0.7	0.1-1 × D	1.2	0.1-1 × D
≤ 2	1	0.1-1 × D	1	0.1-1 × D	1	0.1-1 × D	1.4	0.1-1 × D
≤ 2.5	1.2	0.1-1 × D	1.2	0.1-1 × D	1.2	0.1-1 × D	1.8	0.1-1 × D
≤ 3	1.5	0.1-1 × D	1.5	0.1-1 × D	1.5	0.1-1 × D	2	0.1-1 × D
≤ 4	2	0.1-1 × D	2	0.1-1 × D	2	0.1-1 × D	2.8	0.1-1 × D
≤ 5	2.5	0.1-1 × D	2.5	0.1-1 × D	2.5	0.1-1 × D	3.5	0.1-1 × D
≤ 6	3	0.1-1 × D	3	0.1-1 × D	3	0.1-1 × D	4.2	0.1-1 × D

Nutenfräsen Typ 03 beschichtet | Rainures Type 03 revêtus | Slotting Typ 03 coated

UHM 10 HX	Stahl unlegiert Acier non allié Steel unalloyed (I)		Stahl niedriglegiert Acier faibl. allié Steel low alloyed (II)		Stahl hochlegiert Acier fortem. allié Steel high alloyed (III)		Rostfreier Stahl Acier inoxydable Stainless steel (V)		Rostfreier Stahl Acier inoxydable Stainless steel (VI)	
▼▼										
D (mm)	Drehzahlen (n) und Vorschübe (v _f) Nombre de tours (n) et avances (v _f) Speeds (n) and feeds (v _f)									
	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)
0.2	44'296	147-217	40'269	134-197	—	—	36'608	122-179	29'286	85-125
0.3	44'296	147-244	40'269	134-222	—	—	36'608	122-202	29'286	85-141
0.4	44'296	147-271	40'269	134-246	—	—	36'608	122-224	29'286	85-157
0.5	44'296	180-271	40'269	164-246	—	—	36'608	149-224	29'286	104-157
0.6	44'296	227-327	40'269	206-297	—	—	36'608	187-270	29'286	131-189
0.7	44'296	273-353	40'269	248-321	—	—	36'608	225-292	29'286	158-204
0.8	44'296	363-476	40'269	330-433	—	—	36'608	300-394	29'286	210-276
0.9	34'606	363-517	31'460	330-470	—	—	28'600	300-427	22'880	210-299
1	31'145	452-653	28'314	411-594	—	—	25'740	374-540	20'592	262-378
1.1	29'761	475-680	27'056	432-618	—	—	24'596	393-562	19'677	275-393
1.2	29'069	509-815	26'426	463-741	—	—	24'024	421-674	19'219	295-472
1.3	26'301	509-815	23'910	463-741	—	—	21'736	421-674	17'389	295-472
1.4	23'532	509-815	21'393	463-741	—	—	19'448	421-674	15'558	295-472
1.5	22'148	509-883	20'134	463-803	—	—	18'304	421-730	14'643	295-511
1.6	20'764	509-883	18'876	463-803	—	—	17'160	421-730	13'728	295-511
1.7	19'379	509-883	17'618	463-803	—	—	16'016	421-730	12'813	295-511
1.8	17'995	509-952	16'359	463-865	—	—	14'872	421-786	11'898	295-550
1.9	17'303	509-1088	15'730	463-989	—	—	14'300	421-899	11'440	295-629
2	16'611	567-1333	15'101	515-1212	—	—	13'728	468-1102	10'982	328-771
2.1	15'919	567-1334	14'472	515-1213	—	—	13'156	468-1103	10'525	328-772
2.2	15'227	567-1335	13'842	515-1214	—	—	12'584	468-1104	10'067	328-773
2.3	14'535	567-1222	13'213	515-1111	—	—	12'012	468-1010	9'610	328-707
2.4	13'842	567-1222	12'584	515-1111	—	—	11'440	468-1010	9'152	328-707
2.5	13'150	567-1222	11'955	515-1111	—	—	10'868	468-1010	8'694	328-707
2.6	12'735	567-1222	11'577	515-1111	—	—	10'525	468-1010	8'420	328-707
2.7	12'320	567-1222	11'200	515-1111	—	—	10'182	468-1010	8'145	328-707
2.8	11'766	680-1222	10'696	618-1111	—	—	9'724	562-1010	7'779	393-707
2.9	11'351	680-1222	10'319	618-1111	—	—	9'381	562-1010	7'505	393-707
3	11'074	680-1222	10'067	618-1111	—	—	9'152	562-1010	7'322	393-707
3.5	9'413	624-1088	8'557	567-989	—	—	7'779	515-899	6'223	361-629
4	8'305	567-1032	7'550	515-938	—	—	6'864	468-853	5'491	328-597
4.5	7'336	509-952	6'670	463-865	—	—	6'063	421-786	4'851	295-550
5	6'644	509-895	6'040	463-814	—	—	5'491	421-740	4'393	295-518
6	5'537	452-784	5'034	411-713	—	—	4'576	374-648	3'661	262-454

	Schnitttiefen (a _p) und Zustellung (a _e) Profondeurs de passes (a _p) et déplacement (a _e) Depths of cut (a _p) and width of cut (a _e)									
D (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)
≤ 0.2	0.05	0.05-1 × D	0.05	0.05-1 × D	—	—	0.05	0.05-1 × D	0.05	0.05-1 × D
≤ 0.3	0.07	0.05-1 × D	0.07	0.05-1 × D	—	—	0.07	0.05-1 × D	0.07	0.05-1 × D
≤ 0.4	0.1	0.05-1 × D	0.1	0.05-1 × D	—	—	0.1	0.05-1 × D	0.1	0.05-1 × D
≤ 0.5	0.12	0.1-1 × D	0.12	0.1-1 × D	—	—	0.12	0.1-1 × D	0.12	0.1-1 × D
≤ 0.6	0.15	0.1-1 × D	0.15	0.1-1 × D	—	—	0.15	0.1-1 × D	0.15	0.1-1 × D
≤ 0.7	0.17	0.1-1 × D	0.17	0.1-1 × D	—	—	0.17	0.1-1 × D	0.17	0.1-1 × D
≤ 0.8	0.2	0.1-1 × D	0.2	0.1-1 × D	—	—	0.2	0.1-1 × D	0.2	0.1-1 × D
≤ 0.9	0.22	0.1-1 × D	0.22	0.1-1 × D	—	—	0.22	0.1-1 × D	0.22	0.1-1 × D
≤ 1	0.5	0.1-1 × D	0.5	0.1-1 × D	—	—	0.5	0.1-1 × D	0.5	0.1-1 × D
≤ 1.2	0.6	0.1-1 × D	0.6	0.1-1 × D	—	—	0.6	0.1-1 × D	0.6	0.1-1 × D
≤ 1.5	0.7	0.1-1 × D	0.7	0.1-1 × D	—	—	0.7	0.1-1 × D	0.7	0.1-1 × D
≤ 2	1	0.1-1 × D	1	0.1-1 × D	—	—	1	0.1-1 × D	1	0.1-1 × D
≤ 2.5	1.2	0.1-1 × D	1.2	0.1-1 × D	—	—	1.2	0.1-1 × D	1.2	0.1-1 × D
≤ 3	1.5	0.1-1 × D	1.5	0.1-1 × D	—	—	1.5	0.1-1 × D	1.5	0.1-1 × D
≤ 4	2	0.1-1 × D	2	0.1-1 × D	—	—	2	0.1-1 × D	2	0.1-1 × D
≤ 5	2.5	0.1-1 × D	2.5	0.1-1 × D	—	—	2.5	0.1-1 × D	2.5	0.1-1 × D
≤ 6	3	0.1-1 × D	3	0.1-1 × D	—	—	3	0.1-1 × D	3	0.1-1 × D

Nutenfräsen Typ 03 beschichtet | Rainures Type 03 revêtus | Slotting Typ 03 coated

UHM 10 HX	Titan Titane Titanium	(IV)	Aluminium Aluminium Aluminium	(VII)	Messing Laiton Brass	(VIII)	Kunststoff/Harz Matière synthétique/résine Synthetics/resin	
	Drehzahlen (n) und Vorschübe (v _f) Nombre de tours (n) et avances (v _f) Speeds (n) and feeds (v _f)							
D (mm)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)
0.2	33'280	122-149	41'600	169-208	41'600	135-166	41'600	375-390
0.3	33'280	122-168	41'600	169-234	41'600	135-187	41'600	375-420
0.4	33'280	122-187	41'600	169-260	41'600	135-208	41'600	375-420
0.5	33'280	149-187	41'600	208-260	41'600	166-208	40'950	375-480
0.6	33'280	187-225	41'600	260-312	41'600	208-250	34'450	420-525
0.7	33'280	225-243	41'600	312-338	41'600	250-270	29'510	420-525
0.8	33'280	300-328	41'600	416-455	41'600	333-364	26'000	450-630
0.9	26'000	300-356	32'500	416-494	32'500	333-395	23'400	480-675
1	23'400	374-450	29'250	520-624	29'250	416-500	20'800	525-750
1.1	22'360	393-468	27'950	546-650	27'950	437-520	18'850	525-750
1.2	21'840	421-562	27'300	585-780	27'300	468-624	17'160	540-900
1.3	19'760	421-562	24'700	585-780	24'700	468-624	15'470	540-900
1.4	17'680	421-562	22'100	585-780	22'100	468-624	14'560	540-900
1.5	16'640	421-608	20'800	585-845	20'800	468-676	13'650	480-1050
1.6	15'600	421-608	19'500	585-845	19'500	468-676	12'610	480-1050
1.7	14'560	421-608	18'200	585-845	18'200	468-676	12'090	480-1050
1.8	13'520	421-655	16'900	585-910	16'900	468-728	11'440	480-1050
1.9	13'000	421-749	16'250	585-1040	16'250	468-832	10'920	480-1050
2	12'480	468-918	15'600	650-1274	15'600	520-1020	10'400	480-1050
2.1	11'960	468-918	14'950	650-1274	14'950	520-1020	9'750	480-1050
2.2	11'440	468-918	14'300	650-1274	14'300	520-1020	9'230	480-1050
2.3	10'920	468-842	13'650	650-1170	13'650	520-936	8'840	480-1050
2.4	10'400	468-842	13'000	650-1170	13'000	520-936	8'450	480-1050
2.5	9'880	468-842	12'350	650-1170	12'350	520-936	8'190	480-1125
2.6	9'568	468-842	11'960	650-1170	11'960	520-936	7'800	480-1125
2.7	9'256	468-842	11'570	650-1170	11'570	520-936	7'540	480-1125
2.8	8'840	562-842	11'050	780-1170	11'050	624-936	7'280	480-1125
2.9	8'528	562-842	10'660	780-1170	10'660	624-936	7'020	480-1125
3	8'320	562-842	10'400	780-1170	10'400	624-936	6'890	450-1200
3.5	7'072	515-749	8'840	715-1040	8'840	572-832	5'850	450-1200
4	6'240	468-711	7'800	650-988	7'800	520-790	5'200	330-1050
4.5	5'512	421-655	6'890	585-910	6'890	468-728	4'550	330-1050
5	4'992	421-617	6'240	585-858	6'240	468-686	4'160	240-900
6	4'160	374-540	5'200	520-754	5'200	416-600	3'380	210-750

D (mm)	Schnitttiefen (a _p) und Zustellung (a _e) Profondeurs de passes (a _p) et déplacement (a _e) Depths of cut (a _p) and width of cut (a _e)							
	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)
≤ 0.2	0.05	0.05-1 × D	0.05	0.05-1 × D	0.05	0.05-1 × D	0.1	0.05-1 × D
≤ 0.3	0.07	0.05-1 × D	0.07	0.05-1 × D	0.07	0.05-1 × D	0.2	0.05-1 × D
≤ 0.4	0.1	0.05-1 × D	0.1	0.05-1 × D	0.1	0.05-1 × D	0.3	0.05-1 × D
≤ 0.5	0.12	0.1-1 × D	0.12	0.1-1 × D	0.12	0.1-1 × D	0.4	0.1-1 × D
≤ 0.6	0.15	0.1-1 × D	0.15	0.1-1 × D	0.15	0.1-1 × D	0.5	0.1-1 × D
≤ 0.7	0.17	0.1-1 × D	0.17	0.1-1 × D	0.17	0.1-1 × D	0.6	0.1-1 × D
≤ 0.8	0.2	0.1-1 × D	0.2	0.1-1 × D	0.2	0.1-1 × D	0.6	0.1-1 × D
≤ 0.9	0.22	0.1-1 × D	0.22	0.1-1 × D	0.22	0.1-1 × D	0.7	0.1-1 × D
≤ 1	0.5	0.1-1 × D	0.5	0.1-1 × D	0.5	0.1-1 × D	0.8	0.1-1 × D
≤ 1.2	0.6	0.1-1 × D	0.6	0.1-1 × D	0.6	0.1-1 × D	1	0.1-1 × D
≤ 1.5	0.7	0.1-1 × D	0.7	0.1-1 × D	0.7	0.1-1 × D	1.2	0.1-1 × D
≤ 2	1	0.1-1 × D	1	0.1-1 × D	1	0.1-1 × D	1.4	0.1-1 × D
≤ 2.5	1.2	0.1-1 × D	1.2	0.1-1 × D	1.2	0.1-1 × D	1.8	0.1-1 × D
≤ 3	1.5	0.1-1 × D	1.5	0.1-1 × D	1.5	0.1-1 × D	2	0.1-1 × D
≤ 4	2	0.1-1 × D	2	0.1-1 × D	2	0.1-1 × D	2.8	0.1-1 × D
≤ 5	2.5	0.1-1 × D	2.5	0.1-1 × D	2.5	0.1-1 × D	3.5	0.1-1 × D
≤ 6	3	0.1-1 × D	3	0.1-1 × D	3	0.1-1 × D	4.2	0.1-1 × D

Seitenfräsen Typ 03 | Contours Type 03 | Edge cutting Typ 03

UHM 10	Stahl unlegiert Acier non allié Steel unalloyed		Stahl niedriglegiert Acier faibl. allié Steel low alloyed		Stahl hochlegiert Acier fortem. allié Steel high alloyed		Rostfreier Stahl Acier inoxydable Stainless steel		Rostfreier Stahl Acier inoxydable Stainless steel	
	(I)		(II)		(III)		(V)		(VI)	
	Drehzahlen (n) und Vorschübe (v _f) Nombre de tours (n) et avances (v _f) Speeds (n) and feeds (v _f)									
D (mm)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)
0.2	—	—	—	—	—	—	—	—	—	—
0.3	—	—	—	—	—	—	—	—	—	—
0.4	—	—	—	—	—	—	—	—	—	—
0.5	—	—	—	—	—	—	—	—	—	—
0.6	—	—	—	—	—	—	—	—	—	—
0.7	—	—	—	—	—	—	—	—	—	—
0.8	—	—	—	—	—	—	—	—	—	—
0.9	—	—	—	—	—	—	—	—	—	—
1	—	—	—	—	—	—	—	—	—	—
1.1	—	—	—	—	—	—	—	—	—	—
1.2	—	—	—	—	—	—	—	—	—	—
1.3	—	—	—	—	—	—	—	—	—	—
1.4	—	—	—	—	—	—	—	—	—	—
1.5	—	—	—	—	—	—	—	—	—	—
1.6	—	—	—	—	—	—	—	—	—	—
1.7	—	—	—	—	—	—	—	—	—	—
1.8	—	—	—	—	—	—	—	—	—	—
1.9	—	—	—	—	—	—	—	—	—	—
2	—	—	—	—	—	—	—	—	—	—
2.1	—	—	—	—	—	—	—	—	—	—
2.2	—	—	—	—	—	—	—	—	—	—
2.3	—	—	—	—	—	—	—	—	—	—
2.4	—	—	—	—	—	—	—	—	—	—
2.5	—	—	—	—	—	—	—	—	—	—
2.6	—	—	—	—	—	—	—	—	—	—
2.7	—	—	—	—	—	—	—	—	—	—
2.8	—	—	—	—	—	—	—	—	—	—
2.9	—	—	—	—	—	—	—	—	—	—
3	—	—	—	—	—	—	—	—	—	—
3.5	—	—	—	—	—	—	—	—	—	—
4	—	—	—	—	—	—	—	—	—	—
4.5	—	—	—	—	—	—	—	—	—	—
5	—	—	—	—	—	—	—	—	—	—
6	—	—	—	—	—	—	—	—	—	—

D (mm)	Schnitttiefen (a _p) und Zustellung (a _e) Profondeurs de passes (a _p) et déplacement (a _e) Depths of cut (a _p) and width of cut (a _e)									
	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)
≤ 0.2	—	—	—	—	—	—	—	—	—	—
≤ 0.4	—	—	—	—	—	—	—	—	—	—
≤ 0.5	—	—	—	—	—	—	—	—	—	—
≤ 0.6	—	—	—	—	—	—	—	—	—	—
≤ 0.8	—	—	—	—	—	—	—	—	—	—
≤ 1	—	—	—	—	—	—	—	—	—	—
≤ 1.2	—	—	—	—	—	—	—	—	—	—
≤ 1.5	—	—	—	—	—	—	—	—	—	—
≤ 2	—	—	—	—	—	—	—	—	—	—
≤ 3	—	—	—	—	—	—	—	—	—	—
≤ 4	—	—	—	—	—	—	—	—	—	—
≤ 5	—	—	—	—	—	—	—	—	—	—
≤ 6	—	—	—	—	—	—	—	—	—	—

Seitenfräsen Typ 03 | Contours Type 03 | Edge cutting Typ 03

UHM 10	Titan Titane Titanium	(IV)	Aluminium Aluminium Aluminium	(VII)	Messing Laiton Brass	(VIII)	Kunststoff/Harz Matière synthétique/résine Synthetics/resin	
	Drehzahlen (n) und Vorschübe (v _f) Nombre de tours (n) et avances (v _f) Speeds (n) and feeds (v _f)							
D (mm)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)
0.2	23'296	85-104	32'000	130-160	32'000	117-128	32'000	250-260
0.3	23'296	85-118	32'000	130-180	32'000	104-144	32'000	250-280
0.4	23'296	85-131	32'000	130-200	32'000	104-160	32'000	250-280
0.5	23'296	104-131	32'000	160-200	32'000	128-160	31'500	250-320
0.6	23'296	131-158	32'000	200-240	32'000	160-192	26'500	280-350
0.7	23'296	158-170	32'000	240-260	32'000	192-208	22'700	280-350
0.8	23'296	210-230	32'000	320-350	32'000	256-280	20'000	300-420
0.9	18'200	210-249	25'000	320-380	25'000	256-304	18'000	320-450
1	16'380	262-315	22'500	400-480	22'500	320-384	16'000	350-500
1.1	15'652	275-328	21'500	420-500	21'500	336-400	14'500	350-500
1.2	15'288	295-393	21'000	450-600	21'000	360-480	13'200	360-600
1.3	13'832	295-393	19'000	450-600	19'000	360-480	11'900	360-600
1.4	12'376	295-393	17'000	450-600	17'000	360-480	11'200	360-600
1.5	11'648	295-426	16'000	450-650	16'000	360-520	10'500	320-700
1.6	10'920	295-426	15'000	450-650	15'000	360-520	9'700	320-700
1.7	10'192	295-426	14'000	450-650	14'000	360-520	9'300	320-700
1.8	9'464	295-459	13'000	450-700	13'000	360-560	8'800	320-700
1.9	9'100	295-524	12'500	450-800	12'500	360-640	8'400	320-700
2	8'736	328-643	12'000	500-980	12'000	400-784	8'000	320-700
2.1	8'372	328-643	11'500	500-980	11'500	400-784	7'500	320-700
2.2	8'008	328-644	11'000	500-980	11'000	400-784	7'100	320-700
2.3	7'644	328-589	10'500	500-900	10'500	400-720	6'800	320-700
2.4	7'280	328-589	10'000	500-900	10'000	400-720	6'500	320-700
2.5	6'916	328-589	9'500	500-900	9'500	400-720	6'300	320-750
2.6	6'698	328-589	9'200	500-900	9'200	400-720	6'000	320-750
2.7	6'479	328-589	8'900	500-900	8'900	400-720	5'800	320-750
2.8	6'188	393-589	8'500	600-900	8'500	480-720	5'600	320-750
2.9	5'970	393-589	8'200	600-900	8'200	480-720	5'400	320-750
3	5'824	393-589	8'000	600-900	8'000	480-720	5'300	300-800
3.5	4'950	361-524	6'800	550-800	6'800	440-640	4'500	300-800
4	4'368	328-498	6'000	500-760	6'000	400-608	4'000	220-700
4.5	3'858	295-459	5'300	450-700	5'300	360-560	3'500	220-700
5	3'494	295-432	4'800	450-660	4'800	360-528	3'200	160-600
6	2'912	262-378	4'000	400-580	4'000	320-464	2'600	140-500

	Schnitttiefen (a _p) und Zustellung (a _e) Profondeurs de passes (a _p) et déplacement (a _e) Depths of cut (a _p) and width of cut (a _e)							
D (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)
≤ 0.2	0.01	0.05-1 × D	0.01	0.05-1 × D	0.01	0.05-1 × D	0.025	0.05-1 × D
≤ 0.4	0.02	0.05-1 × D	0.02	0.05-1 × D	0.02	0.05-1 × D	0.05	0.05-1 × D
≤ 0.5	0.025	0.1-1 × D	0.025	0.1-1 × D	0.025	0.1-1 × D	0.06	0.1-1 × D
≤ 0.6	0.03	0.1-1 × D	0.03	0.1-1 × D	0.03	0.1-1 × D	0.075	0.1-1 × D
≤ 0.8	0.04	0.1-1 × D	0.04	0.1-1 × D	0.04	0.1-1 × D	0.1	0.1-1 × D
≤ 1	0.1	0.1-1 × D	0.1	0.1-1 × D	0.1	0.1-1 × D	0.12	0.1-1 × D
≤ 1.2	0.12	0.1-1 × D	0.12	0.1-1 × D	0.12	0.1-1 × D	0.15	0.1-1 × D
≤ 1.5	0.15	0.1-1 × D	0.15	0.1-1 × D	0.15	0.1-1 × D	0.185	0.1-1 × D
≤ 2	0.2	0.1-1 × D	0.2	0.1-1 × D	0.2	0.1-1 × D	0.5	0.1-1 × D
≤ 3	0.3	0.1-1 × D	0.3	0.1-1 × D	0.3	0.1-1 × D	0.75	0.1-1 × D
≤ 4	0.4	0.1-1 × D	0.4	0.1-1 × D	0.4	0.1-1 × D	1	0.1-1 × D
≤ 5	0.5	0.1-1 × D	0.5	0.1-1 × D	0.5	0.1-1 × D	1.25	0.1-1 × D
≤ 6	0.6	0.1-1 × D	0.6	0.1-1 × D	0.6	0.1-1 × D	1.5	0.1-1 × D

Seitenfräsen Typ 03 beschichtet | Contours Type 03 revêtus | Edge cutting Typ 03 coated

UHM 10 HX	Stahl unlegiert Acier non allié Steel unalloyed (I)		Stahl niedriglegiert Acier faibl. allié Steel low alloyed (II)		Stahl hochlegiert Acier fortem. allié Steel high alloyed (III)		Rostfreier Stahl Acier inoxydable Stainless steel (V)		Rostfreier Stahl Acier inoxydable Stainless steel (VI)	
▼▼	Drehzahlen (n) und Vorschübe (v _f) Nombre de tours (n) et avances (v _f) Speeds (n) and feeds (v _f)									
D (mm)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)
0.2	44'296	147-217	40'269	134-197	—	—	36'608	122-179	29'286	85-125
0.3	44'296	147-244	40'269	134-222	—	—	36'608	122-202	29'286	85-141
0.4	44'296	147-271	40'269	134-246	—	—	36'608	122-224	29'286	85-157
0.5	44'296	180-271	40'269	164-246	—	—	36'608	149-224	29'286	104-157
0.6	44'296	227-327	40'269	206-297	—	—	36'608	187-270	29'286	131-189
0.7	44'296	273-353	40'269	248-321	—	—	36'608	225-292	29'286	158-204
0.8	44'296	363-476	40'269	330-433	—	—	36'608	300-394	29'286	210-276
0.9	34'606	363-517	31'460	330-470	—	—	28'600	300-427	22'880	210-299
1	31'145	452-653	28'314	411-594	—	—	25'740	374-540	20'592	262-378
1.1	29'761	475-680	27'056	432-618	—	—	24'596	393-562	19'677	275-393
1.2	29'069	509-815	26'426	463-741	—	—	24'024	421-674	19'219	295-472
1.3	26'301	509-815	23'910	463-741	—	—	21'736	421-674	17'389	295-472
1.4	23'532	509-815	21'393	463-741	—	—	19'448	421-674	15'558	295-472
1.5	22'148	509-883	20'134	463-803	—	—	18'304	421-730	14'643	295-511
1.6	20'764	509-883	18'876	463-803	—	—	17'160	421-730	13'728	295-511
1.7	19'379	509-883	17'618	463-803	—	—	16'016	421-730	12'813	295-511
1.8	17'995	509-952	16'359	463-865	—	—	14'872	421-786	11'898	295-550
1.9	17'303	509-1088	15'730	463-989	—	—	14'300	421-899	11'440	295-629
2	16'611	567-1333	15'101	515-1212	—	—	13'728	468-1102	10'982	328-771
2.1	15'919	567-1334	14'472	515-1213	—	—	13'156	468-1103	10'525	328-772
2.2	15'227	567-1335	13'842	515-1214	—	—	12'584	468-1104	10'067	328-773
2.3	14'535	567-1222	13'213	515-1111	—	—	12'012	468-1010	9'610	328-707
2.4	13'842	567-1222	12'584	515-1111	—	—	11'440	468-1010	9'152	328-707
2.5	13'150	567-1222	11'955	515-1111	—	—	10'868	468-1010	8'694	328-707
2.6	12'735	567-1222	11'577	515-1111	—	—	10'525	468-1010	8'420	328-707
2.7	12'320	567-1222	11'200	515-1111	—	—	10'182	468-1010	8'145	328-707
2.8	11'766	680-1222	10'696	618-1111	—	—	9'724	562-1010	7'779	393-707
2.9	11'351	680-1222	10'319	618-1111	—	—	9'381	562-1010	7'505	393-707
3	11'074	680-1222	10'067	618-1111	—	—	9'152	562-1010	7'322	393-707
3.5	9'413	624-1088	8'557	567-989	—	—	7'779	515-899	6'223	361-629
4	8'305	567-1032	7'550	515-938	—	—	6'864	468-853	5'491	328-597
4.5	7'336	509-952	6'670	463-865	—	—	6'063	421-786	4'851	295-550
5	6'644	509-895	6'040	463-814	—	—	5'491	421-740	4'393	295-518
6	5'537	452-784	5'034	411-713	—	—	4'576	374-648	3'661	262-454

	Schnitttiefen (a _p) und Zustellung (a _e) Profondeurs de passes (a _p) et déplacement (a _e) Depths of cut (a _p) and width of cut (a _e)									
D (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)
≤ 0.2	0.01	0.05-1 × D	0.01	0.05-1 × D	—	—	0.01	0.05-1 × D	0.01	0.05-1 × D
≤ 0.4	0.02	0.05-1 × D	0.02	0.05-1 × D	—	—	0.02	0.05-1 × D	0.02	0.05-1 × D
≤ 0.5	0.025	0.1-1 × D	0.025	0.1-1 × D	—	—	0.025	0.1-1 × D	0.025	0.1-1 × D
≤ 0.6	0.03	0.1-1 × D	0.03	0.1-1 × D	—	—	0.03	0.1-1 × D	0.03	0.1-1 × D
≤ 0.8	0.04	0.1-1 × D	0.04	0.1-1 × D	—	—	0.04	0.1-1 × D	0.04	0.1-1 × D
≤ 1	0.1	0.1-1 × D	0.1	0.1-1 × D	—	—	0.1	0.1-1 × D	0.1	0.1-1 × D
≤ 1.2	0.12	0.1-1 × D	0.12	0.1-1 × D	—	—	0.12	0.1-1 × D	0.12	0.1-1 × D
≤ 1.5	0.15	0.1-1 × D	0.15	0.1-1 × D	—	—	0.15	0.1-1 × D	0.15	0.1-1 × D
≤ 2	0.2	0.1-1 × D	0.2	0.1-1 × D	—	—	0.2	0.1-1 × D	0.2	0.1-1 × D
≤ 3	0.3	0.1-1 × D	0.3	0.1-1 × D	—	—	0.3	0.1-1 × D	0.3	0.1-1 × D
≤ 4	0.4	0.1-1 × D	0.4	0.1-1 × D	—	—	0.4	0.1-1 × D	0.4	0.1-1 × D
≤ 5	0.5	0.1-1 × D	0.5	0.1-1 × D	—	—	0.5	0.1-1 × D	0.5	0.1-1 × D
≤ 6	0.6	0.1-1 × D	0.6	0.1-1 × D	—	—	0.6	0.1-1 × D	0.6	0.1-1 × D

Seitenfräsen Typ 03 beschichtet | Contours Type 03 revêtus | Edge cutting Typ 03 coated

UHM 10 HX	Titan Titane Titanium	(IV)	Aluminium Aluminium Aluminium	(VII)	Messing Laiton Brass	(VIII)	Kunststoff/Harz Matière synthétique/résine Synthetics/resin	
	Drehzahlen (n) und Vorschübe (v _f) Nombre de tours (n) et avances (v _f) Speeds (n) and feeds (v _f)							
D (mm)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)
0.2	33'280	122-149	41'600	169-208	41'600	135-166	41'600	375-390
0.3	33'280	122-168	41'600	169-234	41'600	135-187	41'600	375-420
0.4	33'280	122-187	41'600	169-260	41'600	135-208	41'600	375-420
0.5	33'280	149-187	41'600	208-260	41'600	166-208	40'950	375-480
0.6	33'280	187-225	41'600	260-312	41'600	208-250	34'450	420-525
0.7	33'280	225-243	41'600	312-338	41'600	250-270	29'510	420-525
0.8	33'280	300-328	41'600	416-455	41'600	333-364	26'000	450-630
0.9	26'000	300-356	32'500	416-494	32'500	333-395	23'400	480-675
1	23'400	374-450	29'250	520-624	29'250	416-500	20'800	525-750
1.1	22'360	393-468	27'950	546-650	27'950	437-520	18'850	525-750
1.2	21'840	421-562	27'300	585-780	27'300	468-624	17'160	540-900
1.3	19'760	421-562	24'700	585-780	24'700	468-624	15'470	540-900
1.4	17'680	421-562	22'100	585-780	22'100	468-624	14'560	540-900
1.5	16'640	421-608	20'800	585-845	20'800	468-676	13'650	480-1050
1.6	15'600	421-608	19'500	585-845	19'500	468-676	12'610	480-1050
1.7	14'560	421-608	18'200	585-845	18'200	468-676	12'090	480-1050
1.8	13'520	421-655	16'900	585-910	16'900	468-728	11'440	480-1050
1.9	13'000	421-749	16'250	585-1040	16'250	468-832	10'920	480-1050
2	12'480	468-918	15'600	650-1274	15'600	520-1020	10'400	480-1050
2.1	11'960	468-918	14'950	650-1274	14'950	520-1020	9'750	480-1050
2.2	11'440	468-918	14'300	650-1274	14'300	520-1020	9'230	480-1050
2.3	10'920	468-842	13'650	650-1170	13'650	520-936	8'840	480-1050
2.4	10'400	468-842	13'000	650-1170	13'000	520-936	8'450	480-1050
2.5	9'880	468-842	12'350	650-1170	12'350	520-936	8'190	480-1125
2.6	9'568	468-842	11'960	650-1170	11'960	520-936	7'800	480-1125
2.7	9'256	468-842	11'570	650-1170	11'570	520-936	7'540	480-1125
2.8	8'840	562-842	11'050	780-1170	11'050	624-936	7'280	480-1125
2.9	8'528	562-842	10'660	780-1170	10'660	624-936	7'020	480-1125
3	8'320	562-842	10'400	780-1170	10'400	624-936	6'890	450-1200
3.5	7'072	515-749	8'840	715-1040	8'840	572-832	5'850	450-1200
4	6'240	468-711	7'800	650-988	7'800	520-790	5'200	330-1050
4.5	5'512	421-655	6'890	585-910	6'890	468-728	4'550	330-1050
5	4'992	421-617	6'240	585-858	6'240	468-686	4'160	240-900
6	4'160	374-540	5'200	520-754	5'200	416-600	3'380	210-750

	Schnitttiefen (a _p) und Zustellung (a _e) Profondeurs de passes (a _p) et déplacement (a _e) Depths of cut (a _p) and width of cut (a _e)							
D (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)
≤ 0.2	0.01	0.05-1 × D	0.01	0.05-1 × D	0.01	0.05-1 × D	0.025	0.05-1 × D
≤ 0.4	0.02	0.05-1 × D	0.02	0.05-1 × D	0.02	0.05-1 × D	0.05	0.05-1 × D
≤ 0.5	0.025	0.1-1 × D	0.025	0.1-1 × D	0.025	0.1-1 × D	0.06	0.1-1 × D
≤ 0.6	0.03	0.1-1 × D	0.03	0.1-1 × D	0.03	0.1-1 × D	0.075	0.1-1 × D
≤ 0.8	0.04	0.1-1 × D	0.04	0.1-1 × D	0.04	0.1-1 × D	0.1	0.1-1 × D
≤ 1	0.1	0.1-1 × D	0.1	0.1-1 × D	0.1	0.1-1 × D	0.12	0.1-1 × D
≤ 1.2	0.12	0.1-1 × D	0.12	0.1-1 × D	0.12	0.1-1 × D	0.15	0.1-1 × D
≤ 1.5	0.15	0.1-1 × D	0.15	0.1-1 × D	0.15	0.1-1 × D	0.185	0.1-1 × D
≤ 2	0.2	0.1-1 × D	0.2	0.1-1 × D	0.2	0.1-1 × D	0.5	0.1-1 × D
≤ 3	0.3	0.1-1 × D	0.3	0.1-1 × D	0.3	0.1-1 × D	0.75	0.1-1 × D
≤ 4	0.4	0.1-1 × D	0.4	0.1-1 × D	0.4	0.1-1 × D	1	0.1-1 × D
≤ 5	0.5	0.1-1 × D	0.5	0.1-1 × D	0.5	0.1-1 × D	1.25	0.1-1 × D
≤ 6	0.6	0.1-1 × D	0.6	0.1-1 × D	0.6	0.1-1 × D	1.5	0.1-1 × D

Nutenfräsen Typ 04 | Rainures Type 04 | Slotting Typ 04

UHM 10	Stahl unlegiert Acier non allié Steel unalloyed		Stahl niedriglegiert Acier faibl. allié Steel low alloyed		Stahl hochlegiert Acier fortem. allié Steel high alloyed		Rostfreier Stahl Acier inoxydable Stainless steel		Rostfreier Stahl Acier inoxydable Stainless steel	
	(I)		(II)		(III)		(V)		(VI)	
	Drehzahlen (n) und Vorschübe (v _f) Nombre de tours (n) et avances (v _f) Speeds (n) and feeds (v _f)									
D (mm)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)
0.2	—	—	—	—	—	—	—	—	—	—
0.3	—	—	—	—	—	—	—	—	—	—
0.4	—	—	—	—	—	—	—	—	—	—
0.5	—	—	—	—	—	—	—	—	—	—
0.6	—	—	—	—	—	—	—	—	—	—
0.7	—	—	—	—	—	—	—	—	—	—
0.8	—	—	—	—	—	—	—	—	—	—
0.9	—	—	—	—	—	—	—	—	—	—
1	—	—	—	—	—	—	—	—	—	—
1.1	—	—	—	—	—	—	—	—	—	—
1.2	—	—	—	—	—	—	—	—	—	—
1.3	—	—	—	—	—	—	—	—	—	—
1.4	—	—	—	—	—	—	—	—	—	—
1.5	—	—	—	—	—	—	—	—	—	—
1.6	—	—	—	—	—	—	—	—	—	—
1.7	—	—	—	—	—	—	—	—	—	—
1.8	—	—	—	—	—	—	—	—	—	—
1.9	—	—	—	—	—	—	—	—	—	—
2	—	—	—	—	—	—	—	—	—	—
2.1	—	—	—	—	—	—	—	—	—	—
2.2	—	—	—	—	—	—	—	—	—	—
2.3	—	—	—	—	—	—	—	—	—	—
2.4	—	—	—	—	—	—	—	—	—	—
2.5	—	—	—	—	—	—	—	—	—	—
2.6	—	—	—	—	—	—	—	—	—	—
2.7	—	—	—	—	—	—	—	—	—	—
2.8	—	—	—	—	—	—	—	—	—	—
2.9	—	—	—	—	—	—	—	—	—	—
3	—	—	—	—	—	—	—	—	—	—
3.5	—	—	—	—	—	—	—	—	—	—
4	—	—	—	—	—	—	—	—	—	—
4.5	—	—	—	—	—	—	—	—	—	—
5	—	—	—	—	—	—	—	—	—	—
6	—	—	—	—	—	—	—	—	—	—

D (mm)	Schnitttiefen (a _p) und Zustellung (a _e) Profondeurs de passes (a _p) et déplacement (a _e) Depths of cut (a _p) and width of cut (a _e)									
	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)
≤ 0.2	—	—	—	—	—	—	—	—	—	—
≤ 0.3	—	—	—	—	—	—	—	—	—	—
≤ 0.4	—	—	—	—	—	—	—	—	—	—
≤ 0.5	—	—	—	—	—	—	—	—	—	—
≤ 0.6	—	—	—	—	—	—	—	—	—	—
≤ 0.7	—	—	—	—	—	—	—	—	—	—
≤ 0.8	—	—	—	—	—	—	—	—	—	—
≤ 0.9	—	—	—	—	—	—	—	—	—	—
≤ 1	—	—	—	—	—	—	—	—	—	—
≤ 1.2	—	—	—	—	—	—	—	—	—	—
≤ 1.5	—	—	—	—	—	—	—	—	—	—
≤ 2	—	—	—	—	—	—	—	—	—	—
≤ 2.5	—	—	—	—	—	—	—	—	—	—
≤ 3	—	—	—	—	—	—	—	—	—	—
≤ 4	—	—	—	—	—	—	—	—	—	—
≤ 5	—	—	—	—	—	—	—	—	—	—
≤ 6	—	—	—	—	—	—	—	—	—	—

Nutenfräsen Typ 04 | Rainures Type 04 | Slotting Typ 04

UHM 10	Titan Titane Titanium		Aluminium Aluminium Aluminium		Messing Laiton Brass		Kunststoff/Harz Matière synthétique/résine Synthetics/resin	
	Drehzahlen (n) und Vorschübe (v _f) Nombre de tours (n) et avances (v _f) Speeds (n) and feeds (v _f)							
D (mm)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)
0.2	25'600	221-295	32'000	300-450	32'000	270-360	32'000	500-800
0.3	25'600	221-295	32'000	300-450	32'000	270-360	32'000	500-900
0.4	25'600	221-328	32'000	300-500	32'000	270-400	32'000	600-900
0.5	25'600	258-394	32'000	350-600	32'000	315-480	30'000	600-1000
0.6	25'600	258-524	32'000	350-800	32'000	315-640	28'000	600-1000
0.7	25'600	258-558	32'000	350-850	32'000	315-680	25'500	500-900
0.8	22'400	295-524	28'000	400-800	28'000	360-640	23'000	500-800
0.9	22'400	295-524	28'000	400-800	28'000	360-640	20'250	450-800
1	20'000	295-589	25'000	400-900	25'000	360-720	17'500	400-800
1.1	18'400	315-622	23'000	430-950	23'000	387-760	15'250	400-800
1.2	16'800	331-655	21'000	450-1000	21'000	405-800	13'000	400-800
1.3	15'200	331-655	19'000	450-1000	19'000	405-800	12'000	400-800
1.4	13'600	331-655	17'000	450-1000	17'000	405-800	11'500	400-800
1.5	12'800	331-655	16'000	450-1000	16'000	405-800	11'000	400-600
1.6	12'000	331-655	15'000	450-1000	15'000	405-800	10'400	400-600
1.7	11'200	331-655	14'000	450-1000	14'000	405-800	10'000	400-600
1.8	10'400	369-655	13'000	500-1000	13'000	450-800	9'400	300-500
1.9	10'000	369-655	12'500	500-1000	12'500	450-800	8'800	300-500
2	9'600	369-655	12'000	500-1000	12'000	450-800	8'300	200-400
2.1	9'200	369-655	11'500	500-1000	11'500	450-800	7'800	200-400
2.2	8'800	369-655	11'000	500-1000	11'000	450-800	7'500	200-400
2.3	8'400	369-655	10'500	500-1000	10'500	450-800	7'000	200-400
2.4	8'000	369-655	10'000	500-1000	10'000	450-800	6'800	200-400
2.5	7'600	369-655	9'500	500-1000	9'500	450-800	6'600	200-400
2.6	7'360	369-655	9'200	500-1000	9'200	450-800	6'300	150-400
2.7	7'120	369-655	8'900	500-1000	8'900	450-800	6'000	150-400
2.8	6'800	369-655	8'500	500-1000	8'500	450-800	5'800	150-400
2.9	6'560	369-655	8'200	500-1000	8'200	450-800	5'600	150-400
3	6'400	369-655	8'000	500-1000	8'000	450-800	5'500	150-400
3.5	5'440	331-589	6'800	450-900	6'800	405-720	4'850	120-350
4	4'800	295-524	6'000	400-800	6'000	360-640	4'200	100-300
4.5	4'240	295-524	5'300	400-800	5'300	360-640	3'850	100-300
5	3'840	295-524	4'800	400-800	4'800	360-640	3'500	100-300
6	3'200	295-524	4'000	400-800	4'000	360-640	2'900	100-300

D (mm)	Schnitttiefen (a _p) und Zustellung (a _e) Profondeurs de passes (a _p) et déplacement (a _e) Depths of cut (a _p) and width of cut (a _e)							
	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)
≤ 0.2	0.002-0.005	0.05-1 × D	0.002-0.005	0.05-1 × D	0.002-0.005	0.05-1 × D	0.05-0.1	0.05-1 × D
≤ 0.3	0.002-0.01	0.05-1 × D	0.002-0.01	0.05-1 × D	0.002-0.01	0.05-1 × D	0.05-0.2	0.05-1 × D
≤ 0.4	0.003-0.01	0.05-1 × D	0.003-0.01	0.05-1 × D	0.003-0.01	0.05-1 × D	0.05-0.25	0.05-1 × D
≤ 0.5	0.005-0.015	0.1-1 × D	0.005-0.015	0.1-1 × D	0.005-0.015	0.1-1 × D	0.05-0.25	0.1-1 × D
≤ 0.6	0.005-0.02	0.1-1 × D	0.005-0.02	0.1-1 × D	0.005-0.02	0.1-1 × D	0.1-0.4	0.1-1 × D
≤ 0.7	0.005-0.03	0.1-1 × D	0.005-0.03	0.1-1 × D	0.005-0.03	0.1-1 × D	0.1-0.4	0.1-1 × D
≤ 0.8	0.005-0.05	0.1-1 × D	0.005-0.05	0.1-1 × D	0.005-0.05	0.1-1 × D	0.12-0.5	0.1-1 × D
≤ 0.9	0.005-0.07	0.1-1 × D	0.005-0.07	0.1-1 × D	0.005-0.07	0.1-1 × D	0.12-0.5	0.1-1 × D
≤ 1	0.005-0.08	0.1-1 × D	0.005-0.08	0.1-1 × D	0.005-0.08	0.1-1 × D	0.15-0.6	0.1-1 × D
≤ 1.2	0.007-0.1	0.1-1 × D	0.007-0.1	0.1-1 × D	0.007-0.1	0.1-1 × D	0.2-0.7	0.1-1 × D
≤ 1.5	0.01-0.12	0.1-1 × D	0.01-0.12	0.1-1 × D	0.01-0.12	0.1-1 × D	0.25-0.9	0.1-1 × D
≤ 2	0.02-0.2	0.1-1 × D	0.02-0.2	0.1-1 × D	0.02-0.2	0.1-1 × D	0.35-1.5	0.1-1 × D
≤ 2.5	0.02-0.2	0.1-1 × D	0.02-0.2	0.1-1 × D	0.02-0.2	0.1-1 × D	0.4-1.8	0.1-1 × D
≤ 3	0.03-0.25	0.1-1 × D	0.03-0.25	0.1-1 × D	0.03-0.25	0.1-1 × D	0.5-2	0.1-1 × D
≤ 4	0.05-0.3	0.1-1 × D	0.05-0.3	0.1-1 × D	0.05-0.3	0.1-1 × D	0.6-2.5	0.1-1 × D
≤ 5	0.1-0.3	0.1-1 × D	0.1-0.3	0.1-1 × D	0.1-0.3	0.1-1 × D	0.8-3	0.1-1 × D
≤ 6	0.15-0.4	0.1-1 × D	0.15-0.4	0.1-1 × D	0.15-0.4	0.1-1 × D	1-3	0.1-1 × D

Nutenfräsen Typ 04 beschichtet | Rainures Type 04 revêtus | Slotting Typ 04 coated

UHM 10 HX	Stahl unlegiert Acier non allié Steel unalloyed (I)		Stahl niedriglegiert Acier faibl. allié Steel low alloyed (II)		Stahl hochlegiert Acier fortem. allié Steel high alloyed (III)		Rostfreier Stahl Acier inoxydable Stainless steel (V)		Rostfreier Stahl Acier inoxydable Stainless steel (VI)	
	Drehzahlen (n) und Vorschübe (v _f) Nombre de tours (n) et avances (v _f) Speeds (n) and feeds (v _f)									
D (mm)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)
0.2	44'296	383-612	40'269	348-556	—	—	36'608	316-505	29'286	221-354
0.3	44'296	383-612	40'269	348-556	—	—	36'608	316-505	29'286	253-404
0.4	44'296	383-680	40'269	348-618	—	—	36'608	316-562	29'286	253-450
0.5	44'296	447-818	40'269	406-744	—	—	36'608	369-676	29'286	295-541
0.6	44'296	447-1088	40'269	406-989	—	—	36'608	369-899	29'286	295-719
0.7	44'296	447-1157	40'269	406-1052	—	—	36'608	369-956	29'286	295-765
0.8	38'759	509-1088	35'235	463-989	—	—	32'032	421-899	25'626	337-719
0.9	38'759	509-1088	35'235	463-989	—	—	32'032	421-899	25'626	337-719
1	34'606	509-1222	31'460	463-1111	—	—	28'600	421-1010	22'880	337-808
1.1	31'838	545-1291	28'943	495-1174	—	—	26'312	450-1067	21'050	360-854
1.2	29'069	572-1359	26'426	520-1235	—	—	24'024	473-1123	19'219	378-898
1.3	26'301	572-1359	23'910	520-1235	—	—	21'736	473-1123	17'389	378-898
1.4	23'532	572-1359	21'393	520-1235	—	—	19'448	473-1123	15'558	378-898
1.5	22'148	572-1359	20'134	520-1235	—	—	18'304	473-1123	14'643	378-898
1.6	20'764	572-1359	18'876	520-1235	—	—	17'160	473-1123	13'728	378-898
1.7	19'379	572-1359	17'618	520-1235	—	—	16'016	473-1123	12'813	378-898
1.8	17'995	638-1359	16'359	580-1235	—	—	14'872	527-1123	11'898	422-898
1.9	17'303	638-1359	15'730	580-1235	—	—	14'300	527-1123	11'440	422-898
2	16'611	638-1359	15'101	580-1235	—	—	13'728	527-1123	10'982	422-898
2.1	15'919	638-1359	14'472	580-1235	—	—	13'156	527-1123	10'525	422-898
2.2	15'227	638-1359	13'842	580-1235	—	—	12'584	527-1123	10'067	422-898
2.3	14'535	638-1359	13'213	580-1235	—	—	12'012	527-1123	9'610	422-898
2.4	13'842	638-1359	12'584	580-1235	—	—	11'440	527-1123	9'152	422-898
2.5	13'150	638-1359	11'955	580-1235	—	—	10'868	527-1123	8'694	422-898
2.6	12'735	638-1359	11'577	580-1235	—	—	10'525	527-1123	8'420	422-898
2.7	12'320	638-1359	11'200	580-1235	—	—	10'182	527-1123	8'145	422-898
2.8	11'766	638-1359	10'696	580-1235	—	—	9'724	527-1123	7'779	422-898
2.9	11'351	638-1359	10'319	580-1235	—	—	9'381	527-1123	7'505	422-898
3	11'074	638-1359	10'067	580-1235	—	—	9'152	527-1123	7'322	422-898
3.5	9'413	572-1222	8'557	520-1111	—	—	7'779	473-1010	6'223	378-808
4	8'305	509-1088	7'550	463-989	—	—	6'864	421-899	5'491	337-719
4.5	7'336	509-1088	6'670	463-989	—	—	6'063	421-899	4'851	337-719
5	6'644	509-1088	6'040	463-989	—	—	5'491	421-899	4'393	337-719
6	5'537	509-1088	5'034	463-989	—	—	4'576	421-899	3'661	337-719

	Schnitttiefen (a _p) und Zustellung (a _e) Profondeurs de passes (a _p) et déplacement (a _e) Depths of cut (a _p) and width of cut (a _e)									
D (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)
≤ 0.2	0.002-0.005	0.05-1 × D	0.002-0.005	0.05-1 × D	—	—	0.002-0.005	0.05-1 × D	0.002-0.005	0.05-1 × D
≤ 0.3	0.002-0.01	0.05-1 × D	0.002-0.01	0.05-1 × D	—	—	0.002-0.01	0.05-1 × D	0.002-0.01	0.05-1 × D
≤ 0.4	0.003-0.01	0.05-1 × D	0.003-0.01	0.05-1 × D	—	—	0.003-0.01	0.05-1 × D	0.003-0.01	0.05-1 × D
≤ 0.5	0.005-0.015	0.1-1 × D	0.005-0.015	0.1-1 × D	—	—	0.005-0.015	0.1-1 × D	0.005-0.015	0.1-1 × D
≤ 0.6	0.005-0.02	0.1-1 × D	0.005-0.02	0.1-1 × D	—	—	0.005-0.02	0.1-1 × D	0.005-0.02	0.1-1 × D
≤ 0.7	0.005-0.03	0.1-1 × D	0.005-0.03	0.1-1 × D	—	—	0.005-0.03	0.1-1 × D	0.005-0.03	0.1-1 × D
≤ 0.8	0.005-0.05	0.1-1 × D	0.005-0.05	0.1-1 × D	—	—	0.005-0.05	0.1-1 × D	0.005-0.05	0.1-1 × D
≤ 0.9	0.005-0.07	0.1-1 × D	0.005-0.07	0.1-1 × D	—	—	0.005-0.07	0.1-1 × D	0.005-0.07	0.1-1 × D
≤ 1	0.005-0.08	0.1-1 × D	0.005-0.08	0.1-1 × D	—	—	0.005-0.08	0.1-1 × D	0.005-0.08	0.1-1 × D
≤ 1.2	0.007-0.1	0.1-1 × D	0.007-0.1	0.1-1 × D	—	—	0.007-0.1	0.1-1 × D	0.007-0.1	0.1-1 × D
≤ 1.5	0.01-0.12	0.1-1 × D	0.01-0.12	0.1-1 × D	—	—	0.01-0.12	0.1-1 × D	0.01-0.12	0.1-1 × D
≤ 2	0.02-0.2	0.1-1 × D	0.02-0.2	0.1-1 × D	—	—	0.02-0.2	0.1-1 × D	0.02-0.2	0.1-1 × D
≤ 2.5	0.02-0.2	0.1-1 × D	0.02-0.2	0.1-1 × D	—	—	0.02-0.2	0.1-1 × D	0.02-0.2	0.1-1 × D
≤ 3	0.03-0.25	0.1-1 × D	0.03-0.25	0.1-1 × D	—	—	0.03-0.25	0.1-1 × D	0.03-0.25	0.1-1 × D
≤ 4	0.05-0.3	0.1-1 × D	0.05-0.3	0.1-1 × D	—	—	0.05-0.3	0.1-1 × D	0.05-0.3	0.1-1 × D
≤ 5	0.1-0.3	0.1-1 × D	0.1-0.3	0.1-1 × D	—	—	0.1-0.3	0.1-1 × D	0.1-0.3	0.1-1 × D
≤ 6	0.15-0.4	0.1-1 × D	0.15-0.4	0.1-1 × D	—	—	0.15-0.4	0.1-1 × D	0.15-0.4	0.1-1 × D

Nutenfräsen Typ 04 beschichtet | Rainures Type 04 revêtus | Slotting Typ 04 coated

UHM 10 HX	Titan Titane Titanium		Aluminium Aluminium Aluminium		Messing Laiton Brass		Kunststoff/Harz Matière synthétique/résine Synthetics/resin	
	▼▼	(IV)	(VII)	(VIII)				
	Drehzahlen (n) und Vorschübe (v _f) Nombre de tours (n) et avances (v _f) Speeds (n) and feeds (v _f)							
D (mm)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)
0.2	33'280	316-421	41'600	390-585	41'600	351-468	41'600	750-1200
0.3	33'280	316-421	41'600	390-585	41'600	351-468	41'600	750-1350
0.4	33'280	316-468	41'600	390-650	41'600	351-520	41'600	900-1350
0.5	33'280	369-563	41'600	455-780	41'600	410-625	39'000	900-1500
0.6	33'280	369-749	41'600	455-1040	41'600	410-832	36'400	900-1500
0.7	33'280	369-797	41'600	455-1105	41'600	410-885	33'150	750-1350
0.8	29'120	421-749	36'400	520-1040	36'400	468-832	29'900	750-1200
0.9	29'120	421-749	36'400	520-1040	36'400	468-832	26'325	675-1200
1	26'000	421-842	32'500	520-1170	32'500	468-936	22'750	600-1200
1.1	23'920	450-889	29'900	559-1235	29'900	500-988	19'825	600-1200
1.2	21'840	473-936	27'300	585-1300	27'300	525-1040	16'900	600-1200
1.3	19'760	473-936	24'700	585-1300	24'700	525-1040	15'600	600-1200
1.4	17'680	473-936	22'100	585-1300	22'100	525-1040	14'950	600-1200
1.5	16'640	473-936	20'800	585-1300	20'800	525-1040	14'300	600-900
1.6	15'600	473-936	19'500	585-1300	19'500	525-1040	13'520	600-900
1.7	14'560	473-936	18'200	585-1300	18'200	525-1040	13'000	600-900
1.8	13'520	527-936	16'900	650-1300	16'900	585-1040	12'220	450-750
1.9	13'000	527-936	16'250	650-1300	16'250	585-1040	11'440	450-750
2	12'480	527-936	15'600	650-1300	15'600	585-1040	10'790	300-600
2.1	11'960	527-936	14'950	650-1300	14'950	585-1040	10'140	300-600
2.2	11'440	527-936	14'300	650-1300	14'300	585-1040	9'750	300-600
2.3	10'920	527-936	13'650	650-1300	13'650	585-1040	9'100	300-600
2.4	10'400	527-936	13'000	650-1300	13'000	585-1040	8'840	300-600
2.5	9'880	527-936	12'350	650-1300	12'350	585-1040	8'580	300-600
2.6	9'568	527-936	11'960	650-1300	11'960	585-1040	8'190	225-600
2.7	9'256	527-936	11'570	650-1300	11'570	585-1040	7'800	225-600
2.8	8'840	527-936	11'050	650-1300	11'050	585-1040	7'540	225-600
2.9	8'528	527-936	10'660	650-1300	10'660	585-1040	7'280	225-600
3	8'320	527-936	10'400	650-1300	10'400	585-1040	7'150	225-600
3.5	7'072	473-842	8'840	585-1170	8'840	525-936	6'305	180-525
4	6'240	421-749	7'800	520-1040	7'800	468-832	5'460	150-450
4.5	5'512	421-749	6'890	520-1040	6'890	468-832	5'005	150-450
5	4'992	421-749	6'240	520-1040	6'240	468-832	4'550	150-450
6	4'160	421-749	5'200	520-1040	5'200	468-832	3'770	150-450

D (mm)	Schnitttiefen (a _p) und Zustellung (a _e) Profondeurs de passes (a _p) et déplacement (a _e) Depths of cut (a _p) and width of cut (a _e)							
	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)
≤ 0.2	0.002-0.005	0.05-1 × D	0.002-0.005	0.05-1 × D	0.002-0.005	0.05-1 × D	0.05-0.1	0.05-1 × D
≤ 0.3	0.002-0.01	0.05-1 × D	0.002-0.01	0.05-1 × D	0.002-0.01	0.05-1 × D	0.05-0.2	0.05-1 × D
≤ 0.4	0.003-0.01	0.05-1 × D	0.003-0.01	0.05-1 × D	0.003-0.01	0.05-1 × D	0.05-0.25	0.05-1 × D
≤ 0.5	0.005-0.015	0.1-1 × D	0.005-0.015	0.1-1 × D	0.005-0.015	0.1-1 × D	0.05-0.25	0.1-1 × D
≤ 0.6	0.005-0.02	0.1-1 × D	0.005-0.02	0.1-1 × D	0.005-0.02	0.1-1 × D	0.1-0.4	0.1-1 × D
≤ 0.7	0.005-0.03	0.1-1 × D	0.005-0.03	0.1-1 × D	0.005-0.03	0.1-1 × D	0.1-0.4	0.1-1 × D
≤ 0.8	0.005-0.05	0.1-1 × D	0.005-0.05	0.1-1 × D	0.005-0.05	0.1-1 × D	0.12-0.5	0.1-1 × D
≤ 0.9	0.005-0.07	0.1-1 × D	0.005-0.07	0.1-1 × D	0.005-0.07	0.1-1 × D	0.12-0.5	0.1-1 × D
≤ 1	0.005-0.08	0.1-1 × D	0.005-0.08	0.1-1 × D	0.005-0.08	0.1-1 × D	0.15-0.6	0.1-1 × D
≤ 1.2	0.007-0.1	0.1-1 × D	0.007-0.1	0.1-1 × D	0.007-0.1	0.1-1 × D	0.2-0.7	0.1-1 × D
≤ 1.5	0.01-0.12	0.1-1 × D	0.01-0.12	0.1-1 × D	0.01-0.12	0.1-1 × D	0.25-0.9	0.1-1 × D
≤ 2	0.02-0.2	0.1-1 × D	0.02-0.2	0.1-1 × D	0.02-0.2	0.1-1 × D	0.35-1.5	0.1-1 × D
≤ 2.5	0.02-0.2	0.1-1 × D	0.02-0.2	0.1-1 × D	0.02-0.2	0.1-1 × D	0.4-1.8	0.1-1 × D
≤ 3	0.03-0.25	0.1-1 × D	0.03-0.25	0.1-1 × D	0.03-0.25	0.1-1 × D	0.5-2	0.1-1 × D
≤ 4	0.05-0.3	0.1-1 × D	0.05-0.3	0.1-1 × D	0.05-0.3	0.1-1 × D	0.6-2.5	0.1-1 × D
≤ 5	0.1-0.3	0.1-1 × D	0.1-0.3	0.1-1 × D	0.1-0.3	0.1-1 × D	0.8-3	0.1-1 × D
≤ 6	0.15-0.4	0.1-1 × D	0.15-0.4	0.1-1 × D	0.15-0.4	0.1-1 × D	1-3	0.1-1 × D

Seitenfräsen Typ 04 | Contours Type 04 | Edge cutting Typ 04

UHM 10	Stahl unlegiert Acier non allié Steel unalloyed		Stahl niedriglegiert Acier faibl. allié Steel low alloyed		Stahl hochlegiert Acier fortem. allié Steel high alloyed		Rostfreier Stahl Acier inoxydable Stainless steel		Rostfreier Stahl Acier inoxydable Stainless steel	
	(I)		(II)		(III)		(V)		(VI)	
	Drehzahlen (n) und Vorschübe (v _f) Nombre de tours (n) et avances (v _f) Speeds (n) and feeds (v _f)									
D (mm)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)
0.2	—	—	—	—	—	—	—	—	—	—
0.3	—	—	—	—	—	—	—	—	—	—
0.4	—	—	—	—	—	—	—	—	—	—
0.5	—	—	—	—	—	—	—	—	—	—
0.6	—	—	—	—	—	—	—	—	—	—
0.7	—	—	—	—	—	—	—	—	—	—
0.8	—	—	—	—	—	—	—	—	—	—
0.9	—	—	—	—	—	—	—	—	—	—
1	—	—	—	—	—	—	—	—	—	—
1.1	—	—	—	—	—	—	—	—	—	—
1.2	—	—	—	—	—	—	—	—	—	—
1.3	—	—	—	—	—	—	—	—	—	—
1.4	—	—	—	—	—	—	—	—	—	—
1.5	—	—	—	—	—	—	—	—	—	—
1.6	—	—	—	—	—	—	—	—	—	—
1.7	—	—	—	—	—	—	—	—	—	—
1.8	—	—	—	—	—	—	—	—	—	—
1.9	—	—	—	—	—	—	—	—	—	—
2	—	—	—	—	—	—	—	—	—	—
2.1	—	—	—	—	—	—	—	—	—	—
2.2	—	—	—	—	—	—	—	—	—	—
2.3	—	—	—	—	—	—	—	—	—	—
2.4	—	—	—	—	—	—	—	—	—	—
2.5	—	—	—	—	—	—	—	—	—	—
2.6	—	—	—	—	—	—	—	—	—	—
2.7	—	—	—	—	—	—	—	—	—	—
2.8	—	—	—	—	—	—	—	—	—	—
2.9	—	—	—	—	—	—	—	—	—	—
3	—	—	—	—	—	—	—	—	—	—
3.5	—	—	—	—	—	—	—	—	—	—
4	—	—	—	—	—	—	—	—	—	—
4.5	—	—	—	—	—	—	—	—	—	—
5	—	—	—	—	—	—	—	—	—	—
6	—	—	—	—	—	—	—	—	—	—

D (mm)	Schnitttiefen (a _p) und Zustellung (a _e) Profondeurs de passes (a _p) et déplacement (a _e) Depths of cut (a _p) and width of cut (a _e)									
	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)
≤ 0.2	—	—	—	—	—	—	—	—	—	—
≤ 0.3	—	—	—	—	—	—	—	—	—	—
≤ 0.4	—	—	—	—	—	—	—	—	—	—
≤ 0.5	—	—	—	—	—	—	—	—	—	—
≤ 0.6	—	—	—	—	—	—	—	—	—	—
≤ 0.7	—	—	—	—	—	—	—	—	—	—
≤ 0.8	—	—	—	—	—	—	—	—	—	—
≤ 0.9	—	—	—	—	—	—	—	—	—	—
≤ 1	—	—	—	—	—	—	—	—	—	—
≤ 1.2	—	—	—	—	—	—	—	—	—	—
≤ 1.5	—	—	—	—	—	—	—	—	—	—
≤ 2	—	—	—	—	—	—	—	—	—	—
≤ 2.5	—	—	—	—	—	—	—	—	—	—

Seitenfräsen Typ 04 | Contours Type 04 | Edge cutting Typ 04

UHM 10	Titan Titane Titanium	(IV)	Aluminium Aluminium Aluminium	(VII)	Messing Laiton Brass	(VIII)	Kunststoff/Harz Matière synthétique/résine Synthetics/resin	
	Drehzahlen (n) und Vorschübe (v _f) Nombre de tours (n) et avances (v _f) Speeds (n) and feeds (v _f)							
D (mm)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)
0.2	25'600	221-295	32'000	300-450	32'000	270-360	32'000	500-800
0.3	25'600	221-295	32'000	300-450	32'000	270-360	32'000	500-900
0.4	25'600	221-328	32'000	300-500	32'000	270-400	32'000	600-900
0.5	25'600	258-394	32'000	350-600	32'000	315-480	30'000	600-1000
0.6	25'600	258-524	32'000	350-800	32'000	315-640	28'000	600-1000
0.7	25'600	258-558	32'000	350-850	32'000	315-680	25'500	500-900
0.8	22'400	295-524	28'000	400-800	28'000	360-640	23'000	500-800
0.9	22'400	295-524	28'000	400-800	28'000	360-640	20'250	450-800
1	20'000	295-589	25'000	400-900	25'000	360-720	17'500	400-800
1.1	18'400	315-622	23'000	430-950	23'000	387-760	15'250	400-800
1.2	16'800	331-655	21'000	450-1000	21'000	405-800	13'000	400-800
1.3	15'200	331-655	19'000	450-1000	19'000	405-800	12'000	400-800
1.4	13'600	331-655	17'000	450-1000	17'000	405-800	11'500	400-800
1.5	12'800	331-655	16'000	450-1000	16'000	405-800	11'000	400-600
1.6	12'000	331-655	15'000	450-1000	15'000	405-800	10'400	400-600
1.7	11'200	331-655	14'000	450-1000	14'000	405-800	10'000	400-600
1.8	10'400	369-655	13'000	500-1000	13'000	450-800	9'400	300-500
1.9	10'000	369-655	12'500	500-1000	12'500	450-800	8'800	300-500
2	9'600	369-655	12'000	500-1000	12'000	450-800	8'300	200-400
2.1	9'200	369-655	11'500	500-1000	11'500	450-800	7'800	200-400
2.2	8'800	369-655	11'000	500-1000	11'000	450-800	7'500	200-400
2.3	8'400	369-655	10'500	500-1000	10'500	450-800	7'000	200-400
2.4	8'000	369-655	10'000	500-1000	10'000	450-800	6'800	200-400
2.5	7'600	369-655	9'500	500-1000	9'500	450-800	6'600	200-400
2.6	7'360	369-655	9'200	500-1000	9'200	450-800	6'300	150-400
2.7	7'120	369-655	8'900	500-1000	8'900	450-800	6'000	150-400
2.8	6'800	369-655	8'500	500-1000	8'500	450-800	5'800	150-400
2.9	6'560	369-655	8'200	500-1000	8'200	450-800	5'600	150-400
3	6'400	369-655	8'000	500-1000	8'000	450-800	5'500	150-400
3.5	5'440	331-589	6'800	450-900	6'800	405-720	4'850	120-350
4	4'800	295-524	6'000	400-800	6'000	360-640	4'200	100-300
4.5	4'240	295-524	5'300	400-800	5'300	360-640	3'850	100-300
5	3'840	295-524	4'800	400-800	4'800	360-640	3'500	100-300
6	3'200	295-524	4'000	400-800	4'000	360-640	2'900	100-300

D (mm)	Schnitttiefen (a _p) und Zustellung (a _e) Profondeurs de passes (a _p) et déplacement (a _e) Depths of cut (a _p) and width of cut (a _e)							
	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)
≤ 0.2	0.002-0.01	0.05-1 × D	0.002-0.01	0.05-1 × D	0.002-0.01	0.05-1 × D	0.05-0.1	0.05-1 × D
≤ 0.4	0.003-0.01	0.05-1 × D	0.003-0.01	0.05-1 × D	0.003-0.01	0.05-1 × D	0.05-0.2	0.05-1 × D
≤ 0.5	0.005-0.015	0.1-1 × D	0.005-0.015	0.1-1 × D	0.005-0.015	0.1-1 × D	0.05-0.2	0.1-1 × D
≤ 0.6	0.005-0.02	0.1-1 × D	0.005-0.02	0.1-1 × D	0.005-0.02	0.1-1 × D	0.1-0.3	0.1-1 × D
≤ 0.8	0.006-0.05	0.1-1 × D	0.006-0.05	0.1-1 × D	0.006-0.05	0.1-1 × D	0.12-0.4	0.1-1 × D
≤ 1	0.006-0.08	0.1-1 × D	0.006-0.08	0.1-1 × D	0.006-0.08	0.1-1 × D	0.15-0.5	0.1-1 × D
≤ 1.2	0.01-0.1	0.1-1 × D	0.01-0.1	0.1-1 × D	0.01-0.1	0.1-1 × D	0.2-0.6	0.1-1 × D
≤ 1.5	0.02-0.12	0.1-1 × D	0.02-0.12	0.1-1 × D	0.02-0.12	0.1-1 × D	0.25-0.75	0.1-1 × D
≤ 2	0.03-0.2	0.1-1 × D	0.03-0.2	0.1-1 × D	0.03-0.2	0.1-1 × D	0.35-1	0.1-1 × D
≤ 3	0.05-0.25	0.1-1 × D	0.05-0.25	0.1-1 × D	0.05-0.25	0.1-1 × D	0.5-1.5	0.1-1 × D
≤ 4	0.1-0.3	0.1-1 × D	0.1-0.3	0.1-1 × D	0.1-0.3	0.1-1 × D	0.6-2	0.1-1 × D
≤ 5	0.15-0.3	0.1-1 × D	0.15-0.3	0.1-1 × D	0.15-0.3	0.1-1 × D	0.8-2.5	0.1-1 × D
≤ 6	0.2-0.4	0.1-1 × D	0.2-0.4	0.1-1 × D	0.2-0.4	0.1-1 × D	1-3	0.1-1 × D

Seitenfräsen Typ 04 beschichtet | Contours Type 04 revêtus | Edge cutting Typ 04 coated

UHM 10 HX	Stahl unlegiert Acier non allié Steel unalloyed (I)		Stahl niedriglegiert Acier faibl. allié Steel low alloyed (II)		Stahl hochlegiert Acier fortem. allié Steel high alloyed (III)		Rostfreier Stahl Acier inoxydable Stainless steel (V)		Rostfreier Stahl Acier inoxydable Stainless steel (VI)	
▼▼	Drehzahlen (n) und Vorschübe (v _f) Nombre de tours (n) et avances (v _f) Speeds (n) and feeds (v _f)									
D (mm)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)
0.2	44'296	383-612	40'269	348-556	—	—	36'608	316-505	29'286	221-354
0.3	44'296	383-612	40'269	348-556	—	—	36'608	316-505	29'286	253-404
0.4	44'296	383-680	40'269	348-618	—	—	36'608	316-562	29'286	253-450
0.5	44'296	447-818	40'269	406-744	—	—	36'608	369-676	29'286	295-541
0.6	44'296	447-1088	40'269	406-989	—	—	36'608	369-899	29'286	295-719
0.7	44'296	447-1157	40'269	406-1052	—	—	36'608	369-956	29'286	295-765
0.8	38'759	509-1088	35'235	463-989	—	—	32'032	421-899	25'626	337-719
0.9	38'759	509-1088	35'235	463-989	—	—	32'032	421-899	25'626	337-719
1	34'606	509-1222	31'460	463-1111	—	—	28'600	421-1010	22'880	337-808
1.1	31'838	545-1291	28'943	495-1174	—	—	26'312	450-1067	21'050	360-854
1.2	29'069	572-1359	26'426	520-1235	—	—	24'024	473-1123	19'219	378-898
1.3	26'301	572-1359	23'910	520-1235	—	—	21'736	473-1123	17'389	378-898
1.4	23'532	572-1359	21'393	520-1235	—	—	19'448	473-1123	15'558	378-898
1.5	22'148	572-1359	20'134	520-1235	—	—	18'304	473-1123	14'643	378-898
1.6	20'764	572-1359	18'876	520-1235	—	—	17'160	473-1123	13'728	378-898
1.7	19'379	572-1359	17'618	520-1235	—	—	16'016	473-1123	12'813	378-898
1.8	17'995	638-1359	16'359	580-1235	—	—	14'872	527-1123	11'898	422-898
1.9	17'303	638-1359	15'730	580-1235	—	—	14'300	527-1123	11'440	422-898
2	16'611	638-1359	15'101	580-1235	—	—	13'728	527-1123	10'982	422-898
2.1	15'919	638-1359	14'472	580-1235	—	—	13'156	527-1123	10'525	422-898
2.2	15'227	638-1359	13'842	580-1235	—	—	12'584	527-1123	10'067	422-898
2.3	14'535	638-1359	13'213	580-1235	—	—	12'012	527-1123	9'610	422-898
2.4	13'842	638-1359	12'584	580-1235	—	—	11'440	527-1123	9'152	422-898
2.5	13'150	638-1359	11'955	580-1235	—	—	10'868	527-1123	8'694	422-898
2.6	12'735	638-1359	11'577	580-1235	—	—	10'525	527-1123	8'420	422-898
2.7	12'320	638-1359	11'200	580-1235	—	—	10'182	527-1123	8'145	422-898
2.8	11'766	638-1359	10'696	580-1235	—	—	9'724	527-1123	7'779	422-898
2.9	11'351	638-1359	10'319	580-1235	—	—	9'381	527-1123	7'505	422-898
3	11'074	638-1359	10'067	580-1235	—	—	9'152	527-1123	7'322	422-898
3.5	9'413	572-1222	8'557	520-1111	—	—	7'779	473-1010	6'223	378-808
4	8'305	509-1088	7'550	463-989	—	—	6'864	421-899	5'491	337-719
4.5	7'336	509-1088	6'670	463-989	—	—	6'063	421-899	4'851	337-719
5	6'644	509-1088	6'040	463-989	—	—	5'491	421-899	4'393	337-719
6	5'537	509-1088	5'034	463-989	—	—	4'576	421-899	3'661	337-719

D (mm)	Schnitttiefen (a _p) und Zustellung (a _e) Profondeurs de passes (a _p) et déplacement (a _e) Depths of cut (a _p) and width of cut (a _e)									
	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)
≤ 0.2	0.002-0.01	0.05-1 × D	0.002-0.01	0.05-1 × D	—	—	0.002-0.01	0.05-1 × D	0.002-0.01	0.05-1 × D
≤ 0.4	0.003-0.01	0.05-1 × D	0.003-0.01	0.05-1 × D	—	—	0.003-0.01	0.05-1 × D	0.003-0.01	0.05-1 × D
≤ 0.5	0.005-0.015	0.1-1 × D	0.005-0.015	0.1-1 × D	—	—	0.005-0.015	0.1-1 × D	0.005-0.015	0.1-1 × D
≤ 0.6	0.005-0.02	0.1-1 × D	0.005-0.02	0.1-1 × D	—	—	0.005-0.02	0.1-1 × D	0.005-0.02	0.1-1 × D
≤ 0.8	0.006-0.05	0.1-1 × D	0.006-0.05	0.1-1 × D	—	—	0.006-0.05	0.1-1 × D	0.006-0.05	0.1-1 × D
≤ 1	0.006-0.08	0.1-1 × D	0.006-0.08	0.1-1 × D	—	—	0.006-0.08	0.1-1 × D	0.006-0.08	0.1-1 × D
≤ 1.2	0.01-0.1	0.1-1 × D	0.01-0.1	0.1-1 × D	—	—	0.01-0.1	0.1-1 × D	0.01-0.1	0.1-1 × D
≤ 1.5	0.02-0.12	0.1-1 × D	0.02-0.12	0.1-1 × D	—	—	0.02-0.12	0.1-1 × D	0.02-0.12	0.1-1 × D
≤ 2	0.03-0.2	0.1-1 × D	0.03-0.2	0.1-1 × D	—	—	0.03-0.2	0.1-1 × D	0.03-0.2	0.1-1 × D
≤ 3	0.05-0.25	0.1-1 × D	0.05-0.25	0.1-1 × D	—	—	0.05-0.25	0.1-1 × D	0.05-0.25	0.1-1 × D
≤ 4	0.1-0.3	0.1-1 × D	0.1-0.3	0.1-1 × D	—	—	0.1-0.3	0.1-1 × D	0.1-0.3	0.1-1 × D
≤ 5	0.15-0.3	0.1-1 × D	0.15-0.3	0.1-1 × D	—	—	0.15-0.3	0.1-1 × D	0.15-0.3	0.1-1 × D
≤ 6	0.2-0.4	0.1-1 × D	0.2-0.4	0.1-1 × D	—	—	0.2-0.4	0.1-1 × D	0.2-0.4	0.1-1 × D

Seitenfräsen Typ 04 beschichtet | Contours Type 04 revêtus | Edge cutting Typ 04 coated

UHM 10 HX	Titan Titane Titanium		Aluminium Aluminium Aluminium		Messing Laiton Brass		Kunststoff/Harz Matière synthétique/résine Synthetics/resin	
	Drehzahlen (n) und Vorschübe (v _f) Nombre de tours (n) et avances (v _f) Speeds (n) and feeds (v _f)							
D (mm)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)
0.2	33'280	316-421	41'600	390-585	41'600	351-468	41'600	750-1200
0.3	33'280	316-421	41'600	390-585	41'600	351-468	41'600	750-1350
0.4	33'280	316-468	41'600	390-650	41'600	351-520	41'600	900-1350
0.5	33'280	369-563	41'600	455-780	41'600	410-625	39'000	900-1500
0.6	33'280	369-749	41'600	455-1040	41'600	410-832	36'400	900-1500
0.7	33'280	369-797	41'600	455-1105	41'600	410-885	33'150	750-1350
0.8	29'120	421-749	36'400	520-1040	36'400	468-832	29'900	750-1200
0.9	29'120	421-749	36'400	520-1040	36'400	468-832	26'325	675-1200
1	26'000	421-842	32'500	520-1170	32'500	468-936	22'750	600-1200
1.1	23'920	450-889	29'900	559-1235	29'900	500-988	19'825	600-1200
1.2	21'840	473-936	27'300	585-1300	27'300	525-1040	16'900	600-1200
1.3	19'760	473-936	24'700	585-1300	24'700	525-1040	15'600	600-1200
1.4	17'680	473-936	22'100	585-1300	22'100	525-1040	14'950	600-1200
1.5	16'640	473-936	20'800	585-1300	20'800	525-1040	14'300	600-900
1.6	15'600	473-936	19'500	585-1300	19'500	525-1040	13'520	600-900
1.7	14'560	473-936	18'200	585-1300	18'200	525-1040	13'000	600-900
1.8	13'520	527-936	16'900	650-1300	16'900	585-1040	12'220	450-750
1.9	13'000	527-936	16'250	650-1300	16'250	585-1040	11'440	450-750
2	12'480	527-936	15'600	650-1300	15'600	585-1040	10'790	300-600
2.1	11'960	527-936	14'950	650-1300	14'950	585-1040	10'140	300-600
2.2	11'440	527-936	14'300	650-1300	14'300	585-1040	9'750	300-600
2.3	10'920	527-936	13'650	650-1300	13'650	585-1040	9'100	300-600
2.4	10'400	527-936	13'000	650-1300	13'000	585-1040	8'840	300-600
2.5	9'880	527-936	12'350	650-1300	12'350	585-1040	8'580	300-600
2.6	9'568	527-936	11'960	650-1300	11'960	585-1040	8'190	225-600
2.7	9'256	527-936	11'570	650-1300	11'570	585-1040	7'800	225-600
2.8	8'840	527-936	11'050	650-1300	11'050	585-1040	7'540	225-600
2.9	8'528	527-936	10'660	650-1300	10'660	585-1040	7'280	225-600
3	8'320	527-936	10'400	650-1300	10'400	585-1040	7'150	225-600
3.5	7'072	473-842	8'840	585-1170	8'840	525-936	6'305	180-525
4	6'240	421-749	7'800	520-1040	7'800	468-832	5'460	150-450
4.5	5'512	421-749	6'890	520-1040	6'890	468-832	5'005	150-450
5	4'992	421-749	6'240	520-1040	6'240	468-832	4'550	150-450
6	4'160	421-749	5'200	520-1040	5'200	468-832	3'770	150-450

D (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)
≤ 0.2	0.002-0.01	0.05-1 × D	0.002-0.01	0.05-1 × D	0.002-0.01	0.05-1 × D	0.05-0.1	0.05-1 × D
≤ 0.4	0.003-0.01	0.05-1 × D	0.003-0.01	0.05-1 × D	0.003-0.01	0.05-1 × D	0.05-0.2	0.05-1 × D
≤ 0.5	0.005-0.015	0.1-1 × D	0.005-0.015	0.1-1 × D	0.005-0.015	0.1-1 × D	0.05-0.2	0.1-1 × D
≤ 0.6	0.005-0.02	0.1-1 × D	0.005-0.02	0.1-1 × D	0.005-0.02	0.1-1 × D	0.1-0.3	0.1-1 × D
≤ 0.8	0.006-0.05	0.1-1 × D	0.006-0.05	0.1-1 × D	0.006-0.05	0.1-1 × D	0.12-0.4	0.1-1 × D
≤ 1	0.006-0.08	0.1-1 × D	0.006-0.08	0.1-1 × D	0.006-0.08	0.1-1 × D	0.15-0.5	0.1-1 × D
≤ 1.2	0.01-0.1	0.1-1 × D	0.01-0.1	0.1-1 × D	0.01-0.1	0.1-1 × D	0.2-0.6	0.1-1 × D
≤ 1.5	0.02-0.12	0.1-1 × D	0.02-0.12	0.1-1 × D	0.02-0.12	0.1-1 × D	0.25-0.75	0.1-1 × D
≤ 2	0.03-0.2	0.1-1 × D	0.03-0.2	0.1-1 × D	0.03-0.2	0.1-1 × D	0.35-1	0.1-1 × D
≤ 3	0.05-0.25	0.1-1 × D	0.05-0.25	0.1-1 × D	0.05-0.25	0.1-1 × D	0.5-1.5	0.1-1 × D
≤ 4	0.1-0.3	0.1-1 × D	0.1-0.3	0.1-1 × D	0.1-0.3	0.1-1 × D	0.6-2	0.1-1 × D
≤ 5	0.15-0.3	0.1-1 × D	0.15-0.3	0.1-1 × D	0.15-0.3	0.1-1 × D	0.8-2.5	0.1-1 × D
≤ 6	0.2-0.4	0.1-1 × D	0.2-0.4	0.1-1 × D	0.2-0.4	0.1-1 × D	1-3	0.1-1 × D

Nutenfräsen Typ 05 | Rainures Type 05 | Slotting Typ 05

UHM 20 ▼▼	Stahl unlegiert Acier non allié Steel unalloyed (I)		Stahl niedriglegiert Acier faibl. allié Steel low alloyed (II)		Stahl hochlegiert Acier fortem. allié Steel high alloyed (III)		Rostfreier Stahl Acier inoxydable Stainless steel (V)		Rostfreier Stahl Acier inoxydable Stainless steel (VI)	
	Drehzahlen (n) und Vorschübe (v _f) Nombre de tours (n) et avances (v _f) Speeds (n) and feeds (v _f)									
D (mm)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)
1	11'200	70	8'890	67	—	—	—	—	—	—
1.1	10'150	70	8'050	67	—	—	—	—	—	—
1.2	9'240	70	7'350	67	—	—	—	—	—	—
1.3	8'540	70	6'860	67	—	—	—	—	—	—
1.4	7'910	70	6'300	67	—	—	—	—	—	—
1.5	7'350	70	5'950	67	—	—	—	—	—	—
1.6	7'000	70	5'600	70	—	—	—	—	—	—
1.7	6'510	70	5'250	70	—	—	—	—	—	—
1.8	6'160	70	4'900	74	—	—	—	—	—	—
1.9	5'880	70	4'690	74	—	—	—	—	—	—
2	5'600	95	4'410	77	—	—	—	—	—	—
2.1	5'250	95	4'200	77	—	—	—	—	—	—
2.2	5'040	98	4'060	81	—	—	—	—	—	—
2.3	4'830	102	3'850	81	—	—	—	—	—	—
2.4	4'620	102	3'710	84	—	—	—	—	—	—
2.5	4'410	105	3'570	84	—	—	—	—	—	—
2.6	4'270	109	3'430	84	—	—	—	—	—	—
2.7	4'130	112	3'290	88	—	—	—	—	—	—
2.8	3'990	112	3'150	88	—	—	—	—	—	—
2.9	3'850	116	3'080	88	—	—	—	—	—	—
3	3'710	119	2'940	88	—	—	—	—	—	—

D (mm)	Schnitttiefen (a _p) und Zustellung (a _e) Profondeurs de passes (a _p) et déplacement (a _e) Depths of cut (a _p) and width of cut (a _e)									
	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)
≥ 1	0.3 × D	1 × D	0.3 × D	1 × D	—	—	—	—	—	—

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Nutenfräsen Typ 05 beschichtet | Rainures Type 05 revêtus | Slotting Typ 05 coated

UHM 20 HX ▼▼	Stahl unlegiert Acier non allié Steel unalloyed (I)		Stahl niedriglegiert Acier faibl. allié Steel low alloyed (II)		Stahl hochlegiert Acier fortem. allié Steel high alloyed (III)		Rostfreier Stahl Acier inoxydable Stainless steel (V)		Rostfreier Stahl Acier inoxydable Stainless steel (VI)	
	Drehzahlen (n) und Vorschübe (v _f) Nombre de tours (n) et avances (v _f) Speeds (n) and feeds (v _f)									
D (mm)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)
1	16'000	100	12'700	95	9'500	50	7'600	45	6'080	32
1.1	14'500	100	11'500	95	8'600	55	6'880	50	5'504	35
1.2	13'200	100	10'500	95	7'900	55	6'320	50	5'056	35
1.3	12'200	100	9'800	95	7'300	55	5'840	50	4'672	35
1.4	11'300	100	9'000	95	6'800	55	5'440	50	4'352	35
1.5	10'500	100	8'500	95	6'300	55	5'040	50	4'032	35
1.6	10'000	100	8'000	100	5'900	55	4'720	50	3'776	35
1.7	9'300	100	7'500	100	5'600	55	4'480	50	3'584	35
1.8	8'800	100	7'000	105	5'300	55	4'240	50	3'392	35
1.9	8'400	100	6'700	105	5'000	55	4'000	50	3'200	35
2	8'000	135	6'300	110	4'700	55	3'760	50	3'008	35
2.1	7'500	135	6'000	110	4'500	55	3'600	50	2'880	35
2.2	7'200	140	5'800	115	4'300	55	3'440	50	2'752	35
2.3	6'900	145	5'500	115	4'100	55	3'280	50	2'624	35
2.4	6'600	145	5'300	120	3'900	55	3'120	50	2'496	35
2.5	6'300	150	5'100	120	3'800	55	3'040	50	2'432	35
2.6	6'100	155	4'900	120	3'600	55	2'880	50	2'304	35
2.7	5'900	160	4'700	125	3'500	55	2'800	50	2'240	35
2.8	5'700	160	4'500	125	3'400	55	2'720	50	2'176	35
2.9	5'500	165	4'400	125	3'300	55	2'640	50	2'112	35
3	5'300	170	4'200	125	3'200	55	2'560	50	2'048	35

D (mm)	Schnitttiefen (a _p) und Zustellung (a _e) Profondeurs de passes (a _p) et déplacement (a _e) Depths of cut (a _p) and width of cut (a _e)									
	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)
≥ 1	0.3 × D	1 × D	0.3 × D	1 × D	0.3 × D	1 × D	0.3 × D	1 × D	0.3 × D	1 × D

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Seitenfräsen Typ 05 | Contours Type 05 | Edge cutting Typ 05

UHM 20 ▼▼	Stahl unlegiert Acier non allié Steel unalloyed (I)		Stahl niedriglegiert Acier faibl. allié Steel low alloyed (II)		Stahl hochlegiert Acier fortem. allié Steel high alloyed (III)		Rostfreier Stahl Acier inoxydable Stainless steel (V)		Rostfreier Stahl Acier inoxydable Stainless steel (VI)	
	Drehzahlen (n) und Vorschübe (v _f) Nombre de tours (n) et avances (v _f) Speeds (n) and feeds (v _f)									
D (mm)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)
0.2	32'000	65	32'000	45	—	—	—	—	—	—
0.3	32'000	75	29'200	50	—	—	—	—	—	—
0.4	27'400	95	22'000	50	—	—	—	—	—	—
0.5	26'300	100	21'900	55	—	—	—	—	—	—
0.6	21'900	105	18'500	60	—	—	—	—	—	—
0.7	19'200	105	15'000	60	—	—	—	—	—	—
0.8	16'500	105	11'500	60	—	—	—	—	—	—
0.9	14'750	105	10'500	60	—	—	—	—	—	—
1	13'000	105	9'500	60	—	—	—	—	—	—
1.1	12'000	105	8'725	63	—	—	—	—	—	—
1.2	11'000	105	7'950	65	—	—	—	—	—	—
1.3	10'250	108	7'375	65	—	—	—	—	—	—
1.4	9'500	110	6'800	65	—	—	—	—	—	—
1.5	8'925	113	6'375	68	—	—	—	—	—	—
1.6	8'350	115	5'950	70	—	—	—	—	—	—
1.7	7'875	115	5'625	73	—	—	—	—	—	—
1.8	7'400	115	5'300	75	—	—	—	—	—	—
1.9	7'025	115	5'025	78	—	—	—	—	—	—
2	6'650	115	4'750	80	—	—	—	—	—	—
2.1	6'350	118	4'525	83	—	—	—	—	—	—
2.2	6'050	120	4'300	85	—	—	—	—	—	—
2.3	5'800	120	4'125	85	—	—	—	—	—	—
2.4	5'550	120	3'950	85	—	—	—	—	—	—
2.5	5'325	120	3'800	85	—	—	—	—	—	—
2.6	5'100	120	3'650	85	—	—	—	—	—	—
2.7	4'925	123	3'525	88	—	—	—	—	—	—
2.8	4'750	125	3'400	90	—	—	—	—	—	—
2.9	4'600	128	3'275	90	—	—	—	—	—	—
3	4'450	130	3'150	90	—	—	—	—	—	—

D (mm)	Schnitttiefen (a _p) und Zustellung (a _e) Profondeurs de passes (a _p) et déplacement (a _e) Depths of cut (a _p) and width of cut (a _e)									
	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)
< 1	0.05-0.4 × D	0.1-0.2 × D	0.05-0.4 × D	0.1-0.2 × D	—	—	—	—	—	—
≥ 1	0.1-1.5 × D	0.1-0.2 × D	0.1-1.5 × D	0.1-0.2 × D	—	—	—	—	—	—

Seitenfräsen Typ 05 beschichtet | Contours Type 05 revêtus | Edge cutting Typ 05 coated

UHM 20 HX	Stahl unlegiert Acier non allié Steel unalloyed		Stahl niedriglegiert Acier faibl. allié Steel low alloyed		Stahl hochlegiert Acier fortem. allié Steel high alloyed		Rostfreier Stahl Acier inoxydable Stainless steel		Rostfreier Stahl Acier inoxydable Stainless steel	
	(I)		(II)		(III)		(V)		(VI)	
	Drehzahlen (n) und Vorschübe (v _f) Nombre de tours (n) et avances (v _f) Speeds (n) and feeds (v _f)									
D (mm)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)
0.2	38'400	78	48'000	90	43'800	45	35'040	41	28'032	28
0.3	38'400	90	43'800	100	29'250	60	23'400	54	18'720	38
0.4	32'880	114	33'000	100	22'500	60	18'000	54	14'400	38
0.5	29'500	115	29'500	115	25'000	80	20'000	72	16'000	50
0.6	24'500	115	24'500	115	21'000	85	16'800	77	13'440	54
0.7	24'500	115	24'500	115	21'000	85	16'800	77	13'440	54
0.8	18'500	115	18'500	115	15'500	90	12'400	81	9'920	57
0.9	16'500	115	16'500	115	14'000	90	11'200	81	8'960	57
1	14'100	143	14'100	143	12'150	113	9'720	101	7'776	71
1.1	13'000	143	13'000	143	11'300	113	9'040	101	7'232	71
1.2	12'200	143	12'200	143	10'300	113	8'240	101	6'592	71
1.3	11'500	143	11'500	143	9'800	113	7'840	101	6'272	71
1.4	10'900	143	10'900	143	9'300	113	7'440	101	5'952	71
1.5	10'500	143	10'500	143	8'900	113	7'120	101	5'696	71
1.6	9'900	143	9'900	143	8'300	113	6'640	101	5'312	71
1.7	9'300	143	9'300	143	8'000	113	6'400	101	5'120	71
1.8	9'000	143	9'000	143	7'600	113	6'080	101	4'864	71
1.9	8'700	143	8'700	143	7'400	113	5'920	101	4'736	71
2	8'400	150	8'400	150	7'000	113	5'600	101	4'480	71
2.1	8'200	150	8'200	150	6'800	113	5'440	101	4'352	71
2.2	7'900	150	7'900	150	6'600	113	5'280	101	4'224	71
2.3	7'700	150	7'700	150	6'500	113	5'200	101	4'160	71
2.4	7'500	150	7'500	150	6'400	113	5'120	101	4'096	71
2.5	7'400	165	7'400	165	6'200	123	4'960	110	3'968	77
2.6	7'100	165	7'100	165	6'000	123	4'800	110	3'840	77
2.7	6'800	165	6'800	165	5'800	123	4'640	110	3'712	77
2.8	6'700	165	6'700	165	5'700	123	4'560	110	3'648	77
2.9	6'500	165	6'500	165	5'500	123	4'400	110	3'520	77
3	6'350	175	6'350	175	5'300	130	4'240	117	3'392	82

D (mm)	Schnitttiefen (a _p) und Zustellung (a _e) Profondeurs de passes (a _p) et déplacement (a _e) Depths of cut (a _p) and width of cut (a _e)									
	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)
< 1	0.05-0.4 × D	0.1-0.2 × D	0.05-0.4 × D	0.1-0.2 × D	—	—	—	—	—	—
≥ 1	0.1-1.5 × D	0.1-0.2 × D	0.1-1.5 × D	0.1-0.2 × D	—	—	—	—	—	—

Nutenfräsen Typ 06 beschichtet | Rainures Type 06 revêtus | Slotting Typ 06 coated

UHM 20 HX ▼▼	Stahl unlegiert Acier non allié Steel unalloyed (I)		Stahl niedriglegiert Acier faibl. allié Steel low alloyed (II)		Stahl hochlegiert Acier fortem. allié Steel high alloyed (III)		Rostfreier Stahl Acier inoxydable Stainless steel (V)		Rostfreier Stahl Acier inoxydable Stainless steel (VI)	
	Drehzahlen (n) und Vorschübe (v _f) Nombre de tours (n) et avances (v _f) Speeds (n) and feeds (v _f)									
D (mm)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)
6	3'800	300	3'040	240	2'300	190	1'950	155	1'560	109
8	2'850	325	2'280	260	1'700	170	1'450	155	1'160	109
10	2'200	280	1'760	224	1'350	135	1'150	135	920	95
12	1'850	240	1'480	192	1'150	110	950	110	760	77
14	1'700	215	1'360	172	1'050	100	850	100	680	70
16	1'500	185	1'200	148	950	95	700	95	560	67
18	1'325	165	1'060	132	825	83	625	83	500	58
20	1'150	145	920	116	700	70	550	70	440	49

D (mm)	Schnitttiefen (a _p) und Zustellung (a _e) Profondeurs de passes (a _p) et déplacement (a _e) Depths of cut (a _p) and width of cut (a _e)									
	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)
	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)
≥ 6	0.5 × D	1 × D	0.5 × D	1 × D	0.5 × D	1 × D	0.5 × D	1 × D	0.5 × D	1 × D

Nutenfräsen Typ 06 MMV | Rainures Type 06 MMV | Slotting Typ 06 MMV

UHM 20 ▼▼	Stahl unlegiert Acier non allié Steel unalloyed (I)		Stahl niedriglegiert Acier faibl. allié Steel low alloyed (II)		Stahl hochlegiert Acier fortem. allié Steel high alloyed (III)		Rostfreier Stahl Acier inoxydable Stainless steel (V)		Rostfreier Stahl Acier inoxydable Stainless steel (VI)	
	Drehzahlen (n) und Vorschübe (v _f) Nombre de tours (n) et avances (v _f) Speeds (n) and feeds (v _f)									
D (mm)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)
6	3'000	60	2'000	30	—	—	—	—	—	—
8	2'300	65	1'540	35	—	—	—	—	—	—
10	2'000	65	1'300	35	—	—	—	—	—	—
12	1'760	65	1'000	40	—	—	—	—	—	—
14	1'580	65	950	40	—	—	—	—	—	—
16	1'400	65	900	40	—	—	—	—	—	—
18	1'250	65	800	40	—	—	—	—	—	—
20	1'100	65	700	40	—	—	—	—	—	—

D (mm)	Schnitttiefen (a _p) und Zustellung (a _e) Profondeurs de passes (a _p) et déplacement (a _e) Depths of cut (a _p) and width of cut (a _e)									
	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)
< 8	0.5 × D	1 × D	0.5 × D	1 × D	—	—	—	—	—	—
≥ 8	0.3 × D	1 × D	0.3 × D	1 × D	—	—	—	—	—	—

Nutenfräsen Typ 06 MMV beschichtet | Rainures Type 06 MMV revêtus | Slotting Typ 06 MMV coated

UHM 20 HX	Stahl unlegiert Acier non allié Steel unalloyed		Stahl niedriglegiert Acier faibl. allié Steel low alloyed		Stahl hochlegiert Acier fortem. allié Steel high alloyed		Rostfreier Stahl Acier inoxydable Stainless steel		Rostfreier Stahl Acier inoxydable Stainless steel	
	(I)		(II)		(III)		(V)		(VI)	
	Drehzahlen (n) und Vorschübe (v _f) Nombre de tours (n) et avances (v _f) Speeds (n) and feeds (v _f)									
D (mm)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)
6	3'900	72	3'000	42	2'340	36	1'820	24	1'456	17
8	2'990	78	2'310	49	1'690	42	1'430	24	1'144	17
10	2'600	78	1'950	49	1'560	42	1'300	24	1'040	17
12	2'288	78	1'500	56	1'300	42	1'092	24	874	17
14	2'054	78	1'425	56	1'151	42	975	24	780	17
16	1'820	78	1'350	56	1'001	42	858	24	686	17
18	1'625	78	1'200	56	891	42	715	24	572	17
20	1'430	78	1'050	56	780	42	572	24	458	17

D (mm)	Schnitttiefen (a _p) und Zustellung (a _e) Profondeurs de passes (a _p) et déplacement (a _e) Depths of cut (a _p) and width of cut (a _e)									
	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)
< 8	0.5 × D	1 × D	0.5 × D	1 × D	0.5 × D	1 × D	0.5 × D	1 × D	0.5 × D	1 × D
≥ 8	0.3 × D	1 × D	0.3 × D	1 × D	0.3 × D	1 × D	0.3 × D	1 × D	0.3 × D	1 × D

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Seitenfräsen Typ 06 beschichtet | Contours Type 06 revêtus | Edge cutting Typ 06 coated

UHM 20 HX ▼▼	Stahl unlegiert Acier non allié Steel unalloyed (I)		Stahl niedriglegiert Acier faibl. allié Steel low alloyed (II)		Stahl hochlegiert Acier fortem. allié Steel high alloyed (III)		Rostfreier Stahl Acier inoxydable Stainless steel (V)		Rostfreier Stahl Acier inoxydable Stainless steel (VI)	
	Drehzahlen (n) und Vorschübe (v _f) Nombre de tours (n) et avances (v _f) Speeds (n) and feeds (v _f)									
D (mm)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)
6	4'750	560	3'800	448	2'850	350	2'400	280	1'920	196
8	3'550	605	2'840	484	2'150	325	1'800	300	1'440	210
10	2'750	520	2'200	416	1'700	255	1'450	255	1'160	179
12	2'350	440	1'880	352	1'450	215	1'150	205	920	144
14	2'100	395	1'680	316	1'300	195	1'050	190	840	133
16	1'850	350	1'480	280	1'150	170	950	170	760	119
18	1'650	310	1'320	248	1'025	153	825	150	660	105
20	1'450	270	1'160	216	900	135	700	130	560	91

D (mm)	Schnitttiefen (a _p) und Zustellung (a _e) Profondeurs de passes (a _p) et déplacement (a _e) Depths of cut (a _p) and width of cut (a _e)									
	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)
< 8	0.1-1 × D	0.1-0.2 × D	0.1-1 × D	0.1-0.2 × D	0.1-1 × D	0.1-0.2 × D	0.1-1 × D	0.1-0.2 × D	0.1-1 × D	0.1-0.2 × D
≥ 8	0.1-1 × D	0.2-0.3 × D	0.1-1 × D	0.2-0.3 × D	0.1-1 × D	0.2-0.3 × D	0.1-1 × D	0.2-0.3 × D	0.1-1 × D	0.2-0.3 × D

Seitenfräsen Typ 06 MMV | Contours Type 06 MMV | Edge cutting Typ 06 MMV

UHM 20	Stahl unlegiert Acier non allié Steel unalloyed (I)		Stahl niedriglegiert Acier faibl. allié Steel low alloyed (II)		Stahl hochlegiert Acier fortem. allié Steel high alloyed (III)		Rostfreier Stahl Acier inoxydable Stainless steel (V)		Rostfreier Stahl Acier inoxydable Stainless steel (VI)	
	Drehzahlen (n) und Vorschübe (v _f) Nombre de tours (n) et avances (v _f) Speeds (n) and feeds (v _f)									
D (mm)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)
6	3'900	72	2'000	70	—	—	—	—	—	—
8	2'990	78	1'540	75	—	—	—	—	—	—
10	2'600	78	1'300	80	—	—	—	—	—	—
12	2'288	78	1'100	90	—	—	—	—	—	—
14	2'054	78	1'000	90	—	—	—	—	—	—
16	1'820	78	900	90	—	—	—	—	—	—
18	1'625	78	800	90	—	—	—	—	—	—
20	1'430	78	700	90	—	—	—	—	—	—

D (mm)	Schnitttiefen (a _p) und Zustellung (a _e) Profondeurs de passes (a _p) et déplacement (a _e) Depths of cut (a _p) and width of cut (a _e)									
	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)
< 8	1 × D	0.1-0.5 × D	1 × D	0.1-0.5 × D	—	—	—	—	—	—
≥ 8	1 × D	0.1-0.5 × D	1 × D	0.1-0.5 × D	—	—	—	—	—	—

Seitenfräsen Typ 06 MMV beschichtet | Contours Type 06 MMV revêtus | Edge cutting Typ 06 MMV coated

UHM 20 HX	Stahl unlegiert Acier non allié Steel unalloyed		Stahl niedriglegiert Acier faibl. allié Steel low alloyed		Stahl hochlegiert Acier fortem. allié Steel high alloyed		Rostfreier Stahl Acier inoxydable Stainless steel		Rostfreier Stahl Acier inoxydable Stainless steel	
	(I)		(II)		(III)		(V)		(VI)	
	Drehzahlen (n) und Vorschübe (v _f) Nombre de tours (n) et avances (v _f) Speeds (n) and feeds (v _f)									
D (mm)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)	n (min ⁻¹)	v _f (mm/min)
6	3'900	143	3'000	98	2'340	78	1'820	65	1'456	46
8	2'990	150	2'310	105	1'690	85	1'430	72	1'144	50
10	2'600	156	1'950	112	1'560	85	1'300	72	1'040	50
12	2'288	169	1'650	126	1'300	91	1'092	78	874	55
14	1'989	176	1'500	126	1'151	91	975	78	780	55
16	1'690	182	1'350	126	1'001	91	858	78	686	55
18	1'560	182	1'200	126	891	91	715	78	572	55
20	1'430	182	1'050	126	780	91	572	78	458	55

D (mm)	Schnitttiefen (a _p) und Zustellung (a _e) Profondeurs de passes (a _p) et déplacement (a _e) Depths of cut (a _p) and width of cut (a _e)									
	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)	a _p (mm)	a _e (mm)
< 8	1 × D	0.1-0.5 × D	1 × D	0.1-0.5 × D	1 × D	0.1-0.5 × D	1 × D	0.1-0.5 × D	1 × D	0.1-0.5 × D
≥ 8	1 × D	0.1-0.5 × D	1 × D	0.1-0.5 × D	1 × D	0.1-0.5 × D	1 × D	0.1-0.5 × D	1 × D	0.1-0.5 × D

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Schnittgeschwindigkeit (v_c)
Vitesse de coupe (v_c)
Cutting speed (v_c)

$$v_c = \frac{D \cdot \pi \cdot n}{1000} \text{ [m/min]}$$

Umdrehungen pro Minute (n)
Nombre de tours par minute (n)
Revolution per minute (n)

$$n = \frac{v_c \cdot 1000}{D \cdot \pi} \text{ [min}^{-1}\text{]}$$

Vorschubgeschwindigkeit (v_f)
Avance (v_f)
Feedrate (v_f)

$$v_f = f_z \cdot n \cdot z \text{ [mm/min]}$$

Vorschub pro Zahn (f_z)
Avance par dent (f_z)
Feed per tooth (f_z)

$$f_z = \frac{v_f}{n \cdot z} \text{ [mm/min]}$$

Vorschub pro Umdrehung (f)
Avance (f)
Feed per revolution (f)

$$f = f_z \cdot z \text{ [mm]}$$

Zeitspanvolumen (Q)
Volume de copeaux (Q)
Capacity per time (Q)

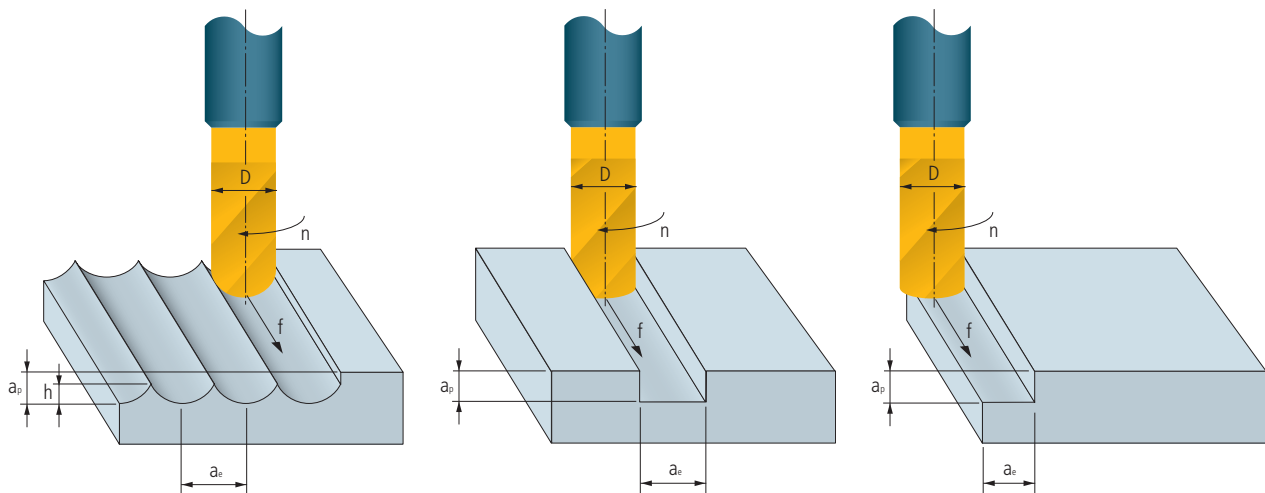
$$Q = \frac{a_p \cdot a_e \cdot v_f}{1000} \text{ [cm}^3\text{/min]}$$

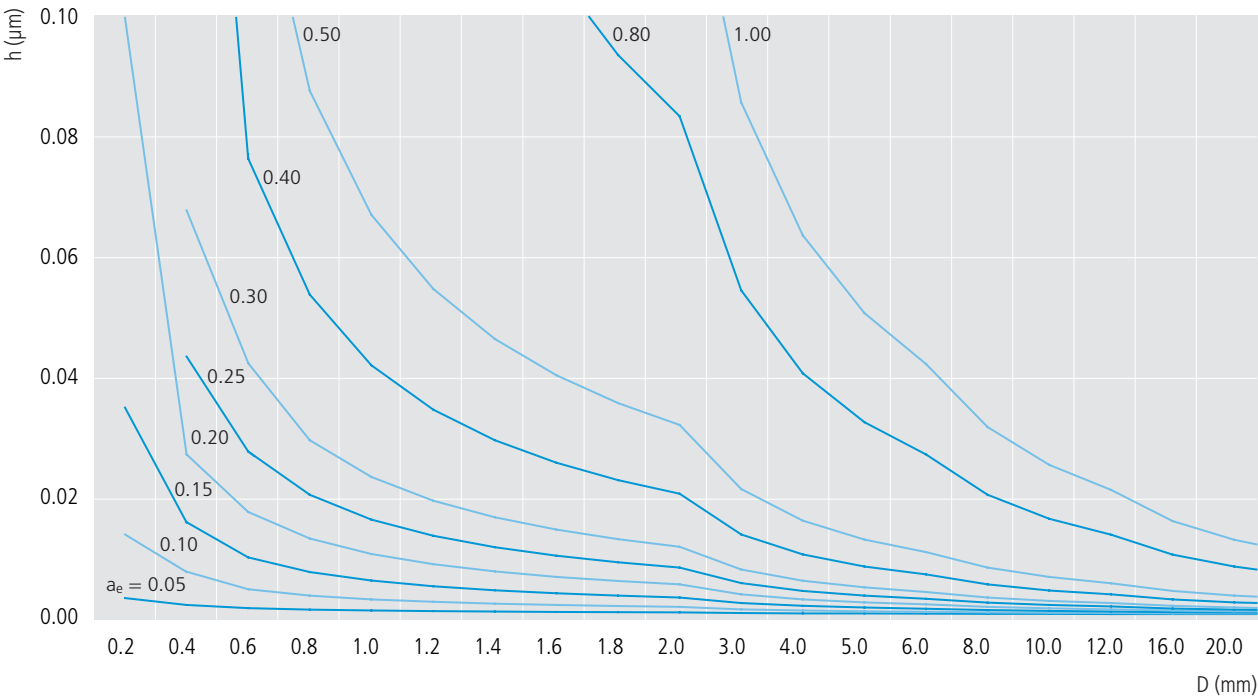
Höhe des Fräsprofils (h)
Hauteur du profile fraisé (h)
Height of the milled profile (h)

$$h \approx \frac{a_e^2}{8 \cdot R} \text{ [}\mu\text{m]}$$

Radiale Seitenzustellung (a_e)
Déplacement latéral (a_e)
Lateral Positioning (a_e)

$$a_e \approx \sqrt{8 \cdot R \cdot h} \text{ [mm]}$$





Sorte Nuance Grade	Normbezeichnung Norme Norm	Zähigkeit des Schneidstoffs Tenacité du matériau de coupe Toughness of cutting grades													Werkstoffe (Kategorie) Matières (Catégorie) Materials (Category)								
		Härte (HB) Dureté (HB) Hardness value (HB)													125 – 300	180 – 250	200 – 350		180 – 220	220 – 330	60 – 130		
		01	05	10	15	20	25	30	35	40	45	50	Stahl unlegiert Acier non allié Steel non-alloyed (I)	Stahl niedrig legiert Acier faibl. allié Steel low alloyed (II)	Stahl hochlegiert Acier fortem. allié Steel high alloyed (III)	Titan Titane Titanium (IV)	Rostfreier Stahl Acier inoxydable Stainless steel (V)	Rostfreier Stahl Acier inoxydable Stainless steel (VI)	Aluminium Aluminium Aluminium (VII)	Messing Laiton Brass (VIII)	Kunststoff/ Harz Matière synthétique/résine Synthetics/resin		
Hartmetall Carbure Carbide																							
UHM 10	K 10/M 10												●	○	●	○	●	○	●	○	●		
UHM 10 HX	K 10/M 10												●	○	●	○	●	○	●	○	●		
UHM 20	K 20/M 20												●	○	●	○	●	○	●	○	●		
UHM 20 HX	K 20/M 20												●	○	●	○	●	○	●	○	●		

MULTIDEC®-DRILL

Kurzbeschreibung Gamme de produits Product line	333

Bohrer Forets Drills		334

Schnittdaten Données de coupe Cutting specification	Spindel U/min Spindle RPM Spindle speed (RPM) Empfehlung Recommandation Recommendation Bohrleistung Productivité Drilling rate	Best analyzed	Best low alloy	Best high alloy	Stainless
		125–200	180–250	200–250	–
		1	2	3	4
		***	***	***	***
		***	***	***	***

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Anwendungsbereiche der Schneidstoffsorten Domaines d'applications des matériaux de coupe Application range of cutting grades	352

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Multidec®-Drill bietet ein breites Angebot an hochpräzisen VHM-Bohrern.

Das komplette Programm umfasst den Bereich von Ø 0.3–20 mm. Multidec®-Drill zeichnet sich durch seine hohe Stabilität und Genauigkeit aus. Die exzellente Positionierbarkeit und die Eigenschaft der Selbstzentrierung tragen massgeblich zur hohen erreichbaren Qualität bei und erleichtert die Arbeit. Das Design ermöglicht zusätzlich eine gute Spanabfuhr.

Durch die Beschichtung TiAlN (HX) wird die Standzeit erheblich verbessert. Je nach Anwendung sind ab Ø 1 mm die Spiralbohrer mit oder ohne Innenkühlung (IC) lieferbar. Die Bohrer ab Ø 3 mm sind in Werkstoffen bis zu 60 HRC problemlos einsetzbar und können auf Kundenwunsch mit Weldon- oder Whistle-Notch-Schaft geliefert sowie in Zwischenmassen angefertigt werden.

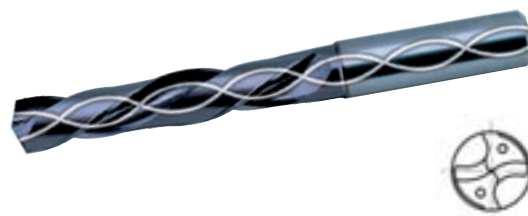
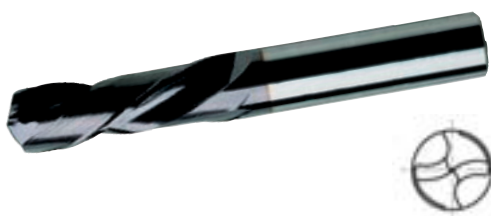
Multidec®-Drill offre un vaste programme de forets carbure de haute précision.

La plage des dimensions des forets débute de Ø 0.3 mm jusqu'à Ø 20 mm inclus. Multidec®-Drill se distingue par sa grande stabilité d'arête et sa grande précision d'usinage. Le positionnement exact et les caractéristiques d'affûtage de la pointe du foret, diminuent considérablement les efforts de coupe. De plus, la forme optimale des goujures favorise une grande évacuation des copeaux.

Le revêtement TiAlN (HX) permet une durée de vie supérieure des arêtes de coupe. En fonction de vos besoins, depuis les Ø de 1 mm, les forets sont disponibles avec ou sans lubrification central (IC). Les forets de Ø 3 mm et supérieur, sont utilisables dans les matériaux d'une dureté jusqu'à 60 HRC sans aucune préparation. Sur demande ils peuvent être livrés avec queue Weldon ou Whistle-Notch et également en diamètres intermédiaires.

Multidec®-Drill provides a very wide range of high precision solid carbide drills.

The complete program contains the Ø 0.3–20 mm. Multidec®-Drill distinguish themselves by high stability and high precision. The excellent positioning and self centering contribute to reach a high quality and makes it easy to work. Additionally the design allows a very good chip removal. The coating TiAlN (HX) improves the operating life considerably. Depending on the application, drills beginning from Ø 1 mm are available with or without internal cooling (IC). Drills bigger than Ø 3 mm can be used for materials up to 60 HRC easily and on customers demand Weldon and Whistle-Notch shank and intermediate sizes of drilling diameter can be produced.



Vorteile:

- Hohe Genauigkeit und Stabilität
- Selbstzentrierend
- Exzellente Positionierbarkeit
- Gute Spanabfuhr (kein Räumen notwendig)
- Komplettes Programm an VHM-Spiralbohrern von Ø 0.3–20 mm
- Ø 0.3–3 mm in Schritten von 0.01 mm
- Ab Ø 1 mm wahlweise mit/ohne Innenkühlung (IC) erhältlich
- Beschichtung TiAlN (HX) für höhere Standzeiten
- Ab Ø 3 mm problemlos in Werkstoffen bis zu einer Härte von 60 HRC einsetzbar
- Ab Ø 3 mm Zwischengrößen möglich

Auf Anfrage:

- Zwischenmasse
- Zylinderschaft mit Weldon oder Whistle Notch

Avantages:

- Haute précision et stabilité
- Auto centrant
- Positionnement excellente
- Évacuation supérieure des copeaux
- Gamme complète dès Ø 0.3–20 mm
- Dès Ø 0.3–3 mm livrable tous les 0.01
- Dès Ø 1 mm livrable avec ou sans lubrification central (IC)
- Revêtement TiAlN (HX) pour rendement supérieur
- Dès Ø 3 mm utilisable sans autre jusqu'à la dureté de 60 HRC
- Dès Ø 3 mm livrable avec tous les diamètres intermédiaires

Sur demande:

- Grandeur intermédiaire
- Queue du cylindre avec Weldon ou Whistle Notch

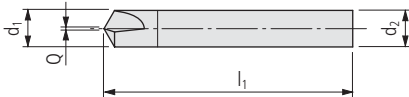
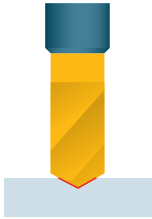
Advantages:

- High precision and stability
- Self centering
- Excellent positioning
- Good chip removal (reaming not required)
- Wide range of solid carbide drill from Ø 0.3–20 mm
- Ø 0.3–3 mm in 0.01-steps
- Bigger than Ø 1 mm with or without internal cooling (IC) available
- Coating TiAlN (HX) for improvement of operating life
- From Ø 3 mm materials up to 60 HRC machinable easily
- From Ø 3 mm intermediate sizes of drilling diameter possible

On request:

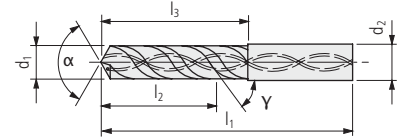
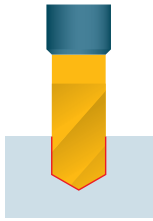
- Intermediate sizes
- Cylinder shank with Weldon or Whistle Notch

Zentrierbohren | Centrage | Center drilling



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide 		Dimensionen Dimensions Dimensions										Bemerkung Remarque Comment
				d ₁	d ₂	l ₁	Q							
DRP ...														
														
														
Ohne Innenkühlung Sans lubrification central Without internal cooling	Mit Innenkühlung Avec lubrification central With internal cooling (... IC)	UHM 10 ...	UHM 10 HX ...											
DRP 338 090 R				3	3	38	0.04							
DRP 338 120 R				3	3	38	0.04							
DRP 338 140 R				3	3	38	0.04							
DRP 442 090 R				4	4	42	0.05							
DRP 442 120 R				4	4	42	0.05							
DRP 442 140 R				4	4	42	0.05							
DRP 650 090 R				6	6	50	0.06							
DRP 650 120 R				6	6	50	0.06							
DRP 650 140 R				6	6	50	0.06							

Bohren | Perçage | Drilling



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide 		Dimensionen Dimensions Dimensions										Bemerkung Remarque Comment
MD ...				d ₁	Tol.	l ₂	d ₂	l ₃	z	α	γ	DIN	l ₁	
Ohne Innenkühlung Sans lubrification central Without internal cooling	Mit Innenkühlung Avec lubrification central With internal cooling (... IC)													
		UHM 10	UHM 10 HX											
MD 25030		■		0.3	h6	3.6	0.3	4	2	118°	25°		30	Micro 1)
MD 25040		■		0.4	h6	4.5	0.4	5	2	118°	25°		30	Micro 1)
MD 25050		■		0.5	h6	5.4	0.5	6	2	118°	25°		30	Micro 1)
MD 25060		■		0.6	h6	5.3	0.6	6	2	118°	25°		30	Micro 1)
MD 25070		■		0.7	h6	11.2	0.7	12	2	118°	25°		40	Micro 1)
MD 25075		■		0.75	h6	11.2	0.75	12	2	118°	25°		40	Micro 1)
MD 2030080			■	0.8	k6	2.4	3	4	2	140°	30°	6537	44	3xD
MD 2050080			■	0.8	k6	4	3	5.6	2	140°	30°	6537	46	5xD
MD 3050080		■		0.8	k6	4	3	5.6	3	130°	30°	6537	46	5xD 3)
MD 2070080			■	0.8	k6	5.6	3	7	2	140°	30°		49	7xD
MD 25080		■		0.8	h6	11.1	0.8	12	2	118°	25°		40	Micro 1)
MD 25085		■		0.85	h6	11.1	0.85	12	2	118°	25°		40	Micro 1)
MD 2030090			■	0.9	k6	2.7	3	5	2	140°	30°	6537	44	3xD
MD 2050090			■	0.9	k6	4.5	3	7	2	140°	30°	6537	46	5xD
MD 3050090		■		0.9	k6	4.5	3	7	3	130°	30°	6537	46	5xD 3)
MD 2070090			■	0.9	k6	6.3	3	8	2	140°	30°		49	7xD
MD 25090		■		0.9	h6	11	0.9	12	2	118°	25°		40	Micro 1)
MD 25095		■		0.95	h6	11	0.95	12	2	118°	25°		40	Micro 1)
MD 2030100			■	1	k6	3	3	5	2	140°	30°	6537	44	3xD
	MD 408010 IC		■	1	m7	5	8	3	2	140°	30°	6537	55	5xD
MD 2050100			■	1	k6	5	3	7	2	140°	30°	6537	46	5xD
MD 3050100		■		1	k6	5	3	7	3	130°	30°	6537	46	5xD 3)
MD 2070100			■	1	k6	7	3	9	2	140°	30°		49	7xD
	MD 2090100 IC		■	1	m7	9	3	13	2	140°	30°		55	9xD
	MD 2120100 IC		■	1	m7	12	3	16	2	140°	30°		55	12xD
MD 25100		■		1	h6	13.9	1	15	2	118°	25°		40	Micro 1)
	MD 2150100 IC		■	1	m7	15	3	19	2	140°	30°		65	15xD
MD 2030110			■	1.1	k6	3.3	3	6	2	140°	30°	6537	44	3xD
	MD 408011 IC		■	1.1	m7	5.5	12	3	2	140°	30°	6537	55	5xD
MD 2050110			■	1.1	k6	5.5	3	8.5	2	140°	30°	6537	46	5xD
MD 3050110		■		1.1	k6	5.5	3	8.5	3	130°	30°	6537	46	5xD 3)
MD 2070110			■	1.1	k6	7.7	3	9	2	140°	30°		49	7xD
MD 25110		■		1.1	h6	13.8	1.1	15	2	118°	25°		40	Micro 1)
MD 2030120			■	1.2	k6	3.6	3	6	2	140°	30°	6537	44	3xD
	MD 408012 IC		■	1.2	m7	6	12	3	2	140°	30°	6537	55	5xD
MD 2050120			■	1.2	k6	6	3	8.5	2	140°	30°	6537	46	5xD
MD 3050120		■		1.2	k6	6	3	8.5	3	130°	30°	6537	46	5xD 3)
MD 2070120			■	1.2	k6	8.4	3	12	2	140°	30°		49	7xD
MD 25120		■		1.2	h6	13.7	1.2	15	2	118°	25°		40	Micro 1)
MD 25125		■		1.25	h6	13.7	1.25	15	2	118°	25°		40	Micro 1)

1) Lieferbar in 0.01-Schritten | Livrable de 1/100 en 1/100 | Available in 0.01-steps

Mindestbestellmenge 10 Stück | Commande minimale de 10 pièces | Minimum order quantity 10 pieces

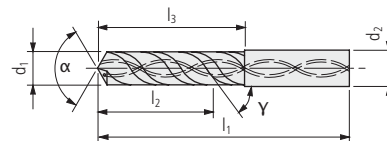
2) Extra kurz | Extra court | Extra short

3) Für Aluminium | Pour aluminium | For aluminium

Legende | Légende | Legend 

Bohren | Perçage | Drilling

Fortsetzung | Suite | Continuation



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide		Dimensionen Dimensions Dimensions										Bemerkung Remarque Comment
		ISO 352		d ₁	Tol.	l ₂	d ₂	l ₃	z	α	γ	DIN	l ₁	
														
MD ...														
														
							h6							
Ohne Innenkühlung Sans lubrification central Without internal cooling	Mit Innenkühlung Avec lubrification central With internal cooling (... IC)	... UHM 10	... UHM 10 HX											
MD 2030130			■	1.3	k6	3.9	3	7	2	140°	30°	6537	44	3xD
	MD 408013 IC		■	1.3	m7	6.5	12	3	2	140°	30°	6537	55	5xD
MD 2050130			■	1.3	k6	6.5	3	10	2	140°	30°	6537	46	5xD
MD 3050130		■		1.3	k6	6.5	3	10	3	130°	30°	6537	46	5xD 3)
MD 2070130			■	1.3	k6	9.1	3	12	2	140°	30°		49	7xD
MD 25130		■		1.3	h6	14.6	1.3	16	2	118°	25°		40	Micro 1)
MD 2030140			■	1.4	k6	4.2	3	7	2	140°	30°	6537	47	3xD
	MD 408014 IC		■	1.4	m7	7	12	3	2	140°	30°	6537	55	5xD
MD 2050140			■	1.4	k6	7	3	10	2	140°	30°	6537	50	5xD
MD 3050140		■		1.4	k6	7	3	10	3	130°	30°	6537	50	5xD 3)
MD 2070140			■	1.4	k6	9.8	3	13	2	140°	30°		53	7xD
MD 25140		■		1.4	h6	14.5	1.4	16	2	118°	25°		40	Micro 1)
MD 25145		■		1.45	h6	14.5	1.45	16	2	118°	25°		40	Micro 1)
MD 2030150			■	1.5	k6	4.5	3	8	2	140°	30°	6537	47	3xD
	MD 408015 IC		■	1.5	m7	7.5	16	3	2	140°	30°	6537	55	5xD
MD 2050150			■	1.5	k6	7.5	3	11	2	140°	30°	6537	50	5xD
MD 3050150		■		1.5	k6	7.5	3	11	3	130°	30°	6537	50	5xD 3)
MD 2070150			■	1.5	k6	10.5	3	15	2	140°	30°		53	7xD
	MD 2090150 IC		■	1.5	m7	13.5	3	20	2	140°	30°		55	9xD
MD 25150		■		1.5	h6	14.4	1.5	16	2	118°	25°		40	Micro 1)
	MD 2120150 IC		■	1.5	m7	18	3	24	2	140°	30°		55	12xD
	MD 2150150 IC		■	1.5	m7	22.5	3	29	2	140°	30°		65	15xD
MD 2030160			■	1.6	k6	4.8	3	8	2	140°	30°	6537	47	3xD
	MD 408016 IC		■	1.6	m7	8	16	3	2	140°	30°	6537	55	5xD
MD 2050160			■	1.6	k6	8	3	11	2	140°	30°	6537	50	5xD
MD 3050160		■		1.6	k6	8	3	11	3	130°	30°	6537	50	5xD 3)
MD 2070160			■	1.6	k6	11.2	3	15	2	140°	30°		53	7xD
MD 25160		■		1.6	h6	16.3	1.6	18	2	118°	25°		40	Micro 1)
MD 2030170			■	1.7	k6	5.1	3	9	2	140°	30°	6537	47	3xD
	MD 408017 IC		■	1.7	m7	8.5	16	3	2	140°	30°	6537	55	5xD
MD 2050170			■	1.7	k6	8.5	3	12.5	2	140°	30°	6537	50	5xD
MD 3050170		■		1.7	k6	8.5	3	12.5	3	130°	30°	6537	50	5xD 3)
MD 2070170			■	1.7	k6	11.9	3	16	2	140°	30°		53	7xD
MD 25170		■		1.7	h6	16.2	1.7	18	2	118°	25°		40	Micro 1)
MD 25175		■		1.75	h6	16.2	1.75	18	2	118°	25°		40	Micro 1)
MD 2030180			■	1.8	k6	5.4	3	9	2	140°	30°	6537	47	3xD
	MD 408018 IC		■	1.8	m7	9	16	3	2	140°	30°	6537	55	5xD
MD 2050180			■	1.8	k6	9	3	12.5	2	140°	30°	6537	50	5xD
MD 3050180		■		1.8	k6	9	3	12.5	3	130°	30°	6537	50	5xD 3)
MD 2070180			■	1.8	k6	12.6	3	16	2	140°	30°		53	7xD
MD 25180		■		1.8	h6	16.1	1.8	18	2	118°	25°		40	Micro 1)
MD 2030190			■	1.9	k6	5.7	3	10	2	140°	30°	6537	47	3xD
	MD 408019 IC		■	1.9	m7	9.5	16	3	2	140°	30°	6537	55	5xD
MD 2050190			■	1.9	k6	9.5	3	14	2	140°	30°	6537	50	5xD
MD 3050190		■		1.9	k6	9.5	3	14	3	130°	30°	6537	50	5xD 3)
MD 2070190			■	1.9	k6	13.3	3	18	2	140°	30°		53	7xD
MD 25190		■		1.9	h6	16	1.9	18	2	118°	25°		40	Micro 1)
MD 2030200			■	2	k6	6	4	10	2	140°	30°	6537	54	3xD

1) Lieferbar in 0.01-Schritten | Livrable de 1/100 en 1/100 | Available in 0.01-steps

Mindestbestellmenge 10 Stück | Commande minimale de 10 pièces | Minimum order quantity 10 pieces

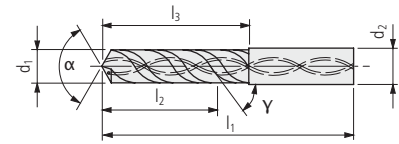
2) Extra kurz | Extra court | Extra short

3) Für Aluminium | Pour aluminium | For aluminium

Legende | Légende | Legend

Bohren | Perçage | Drilling

Fortsetzung | Suite | Continuation



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide 		Dimensionen Dimensions Dimensions										Bemerkung Remarque Comment
				d ₁	Tol.	l ₂	d ₂	l ₃	z	α	γ	DIN	l ₁	
							h ₆							
MD ...														
Ohne Innenkühlung Sans lubrification central Without internal cooling	Mit Innenkühlung Avec lubrification central With internal cooling (... IC)	... UHM 10	... UHM 10 HX											
	MD 408020 IC			2	m7	10	21	4	2	140°	30°	6537	57	5xD
MD 2050200				2	k6	10	4	14	2	140°	30°	6537	56	5xD
MD 3050200				2	k6	10	4	14	3	130°	30°	6537	56	5xD 3)
MD 2070200				2	k6	14	4	18	2	140°	30°		59	7xD
MD 25200				2	h6	15.9	2	18	2	118°	25°		40	Micro 1)
	MD 2090200 IC			2	m7	18	4	26	2	140°	30°		65	9xD
	MD 2120200 IC			2	m7	24	4	32	2	140°	30°		75	12xD
	MD 2150200 IC			2	m7	30	4	38	2	140°	30°		75	15xD
MD 2030210				2.1	k6	6.3	4	11	2	140°	30°	6537	54	3xD
	MD 408021 IC			2.1	m7	10.5	21	4	2	140°	30°	6537	57	5xD
MD 2050210				2.1	k6	10.5	4	15.5	2	140°	30°	6537	56	5xD
MD 3050210				2.1	k6	10.5	4	15.5	3	130°	30°	6537	56	5xD 3)
MD 2070210				2.1	k6	14.7	4	20	2	140°	30°		59	7xD
MD 25210				2.1	h6	17.8	2.1	20	2	118°	25°		40	Micro 1)
MD 2030220				2.2	k6	6.6	4	11	2	140°	30°	6537	54	3xD
	MD 408022 IC			2.2	m7	11	21	4	2	140°	30°	6537	57	5xD
MD 2050220				2.2	k6	11	4	15.5	2	140°	30°	6537	56	5xD
MD 3050220				2.2	k6	11	4	15.5	3	130°	30°	6537	56	5xD 3)
MD 2070220				2.2	k6	15.4	4	20	2	140°	30°		59	7xD
MD 25220				2.2	h6	17.7	2.2	20	2	118°	25°		40	Micro 1)
MD 2030230				2.3	k6	6.9	4	12	2	140°	30°	6537	54	3xD
	MD 408023 IC			2.3	m7	11.5	21	4	2	140°	30°	6537	57	5xD
MD 2050230				2.3	k6	11.5	4	17	2	140°	30°	6537	56	5xD
MD 3050230				2.3	k6	11.5	4	17	3	130°	30°	6537	56	5xD 3)
MD 2070230				2.3	k6	16.1	4	22	2	140°	30°		59	7xD
MD 25230				2.3	h6	17.6	2.3	20	2	118°	25°		40	Micro 1)
MD 2030240				2.4	k6	7.2	4	12	2	140°	30°	6537	54	3xD
	MD 408024 IC			2.4	m7	12	21	4	2	140°	30°	6537	57	5xD
MD 2050240				2.4	k6	12	4	17	2	140°	30°	6537	56	5xD
MD 3050240				2.4	k6	12	4	17	3	130°	30°	6537	56	5xD 3)
MD 2070240				2.4	k6	16.8	4	22	2	140°	30°		59	7xD
MD 25240				2.4	h6	17.5	2.4	20	2	118°	25°		40	Micro 1)
MD 2030250				2.5	k6	7.5	4	13	2	140°	30°	6537	54	3xD
	MD 408025 IC			2.5	m7	12.5	21	4	2	140°	30°	6537	57	5xD
MD 2050250				2.5	k6	12.5	4	18	2	140°	30°	6537	56	5xD
MD 3050250				2.5	k6	12.5	4	18	3	130°	30°	6537	56	5xD 3)
MD 25250				2.5	h6	17.4	2.5	20	2	118°	25°		40	Micro 1)
MD 2070250				2.5	k6	17.5	4	24	2	140°	30°		64	7xD
	MD 2090250 IC			2.5	m7	22.5	4	33	2	140°	30°		70	9xD
	MD 2120250 IC			2.5	m7	30	4	40	2	140°	30°		75	12xD
	MD 2150250 IC			2.5	m7	37.5	4	47	2	140°	30°		85	15xD
MD 2030260				2.6	k6	7.8	4	13	2	140°	30°	6537	56	3xD
	MD 408026 IC			2.6	m7	13	21	4	2	140°	30°	6537	57	5xD
MD 2050260				2.6	k6	13	4	18	2	140°	30°	6537	59	5xD
MD 3050260				2.6	k6	13	4	18	3	130°	30°	6537	59	5xD 3)
MD 25260				2.6	h6	17.3	2.6	20	2	118°	25°		45	Micro 1)
MD 2070260				2.6	k6	18.2	4	24	2	140°	30°		64	7xD
MD 2030270				2.7	k6	8.1	4	14	2	140°	30°	6537	56	3xD

1) Lieferbar in 0.01-Schritten | Livrable de 1/100 en 1/100 | Available in 0.01-steps

Mindestbestellmenge 10 Stück | Commande minimale de 10 pièces | Minimum order quantity 10 pieces

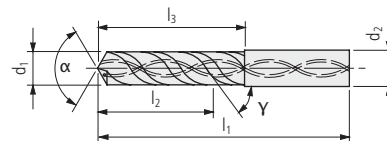
2) Extra kurz | Extra court | Extra short

3) Für Aluminium | Pour aluminium | For aluminium

Legende | Légende | Legend 

Bohren | Perçage | Drilling

Fortsetzung | Suite | Continuation



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide		Dimensionen Dimensions Dimensions										Bemerkung Remarque Comment
				d1	Tol.	l2	d2	l3	z	α	γ	DIN	l1	
MD ...														
Ohne Innenkühlung Sans lubrification central Without internal cooling	Mit Innenkühlung Avec lubrification central With internal cooling (... IC)	...	...											
	MD 408027 IC			2.7	m7	13.5	21	4	2	140°	30°	6537	57	5xD
MD 2050270				2.7	k6	13.5	4	19.5	2	140°	30°	6537	59	5xD
MD 3050270				2.7	k6	13.5	4	19.5	3	130°	30°	6537	59	5xD 3)
MD 25270				2.7	h6	17.2	2.7	20	2	118°	25°		45	Micro 1)
MD 2070270				2.7	k6	18.9	4	25	2	140°	30°		64	7xD
MD 2030280				2.8	k6	8.4	4	14	2	140°	30°	6537	56	3xD
	MD 408028 IC			2.8	m7	14	21	4	2	140°	30°	6537	57	5xD
MD 2050280				2.8	k6	14	4	19.5	2	140°	30°	6537	59	5xD
MD 3050280				2.8	k6	14	4	19.5	3	130°	30°	6537	59	5xD 3)
MD 25280				2.8	h6	17.1	2.8	20	2	118°	25°		45	Micro 1)
MD 2070280				2.8	k6	19.6	4	25	2	140°	30°		64	7xD
MD 2030290				2.9	k6	8.7	4	15	2	140°	30°	6537	56	3xD
	MD 408029 IC			2.9	m7	14.5	21	4	2	140°	30°	6537	57	5xD
MD 2050290				2.9	k6	14.5	4	21	2	140°	30°	6537	59	5xD
MD 3050290				2.9	k6	14.5	4	21	3	130°	30°	6537	59	5xD 3)
MD 25290				2.9	h6	17	2.9	20	2	118°	25°		45	Micro 1)
MD 2070290				2.9	k6	20.3	4	27	2	140°	30°		64	7xD
MD 404030				3	h7	9	3	16	2	140°	30°	6539	46	3xD 2)
MD 423030	MD 406030 IC			3	m7	9	6	20	2	140°	30°	6537	62	3xD
MD 3050300				3	k6	15	4	21	3	130°	30°	6537	59	5xD 3)
MD 424030	MD 408030 IC			3	m7	15	6	28	2	140°	30°	6537	66	5xD
MD 2070300				3	k6	21	4	27	2	140°	30°		64	7xD
	MD 421030 IC			3	m7	24	6	34	2	140°	30°	6537	72	8xD
	MD 2090300 IC			3	m7	27	4	39	2	140°	30°		80	9xD
	MD 2120300 IC			3	m7	36	4	48	2	140°	30°		90	12xD
	MD 2150300 IC			3	m7	45	4	57	2	140°	30°		95	15xD
MD 404031				3.1	h7	9.3	3.1	18	2	140°	30°	6539	49	3xD 2)
MD 423031	MD 406031 IC			3.1	m7	9.3	6	20	2	140°	30°	6537	62	3xD
MD 3050310				3.1	k6	15.5	6	24	3	130°	30°	6537	66	5xD 3)
MD 424031	MD 408031 IC			3.1	m7	15.5	6	28	2	140°	30°	6537	66	5xD
MD 2070310				3.1	m6	21.7	6	30	2	140°	30°		72	7xD
	MD 421031 IC			3.1	m7	24.8	6	34	2	140°	30°	6537	72	8xD
MD 404032				3.2	h7	9.6	3.2	18	2	140°	30°	6539	49	3xD 2)
MD 423032	MD 406032 IC			3.2	m7	9.6	6	20	2	140°	30°	6537	62	3xD
MD 3050320				3.2	k6	16	6	24	3	130°	30°	6537	66	5xD 3)
MD 424032	MD 408032 IC			3.2	m7	16	6	28	2	140°	30°	6537	66	5xD
MD 2070320				3.2	m6	22.4	6	30	2	140°	30°		72	7xD
	MD 421032 IC			3.2	m7	25.6	6	34	2	140°	30°	6537	72	8xD
MD 404033				3.3	h7	9.9	3.3	18	2	140°	30°	6539	49	3xD 2)
MD 423033	MD 406033 IC			3.3	m7	9.9	6	20	2	140°	30°	6537	62	3xD
MD 3050330				3.3	k6	16.5	6	24	3	130°	30°	6537	66	5xD 3)
MD 424033	MD 408033 IC			3.3	m7	16.5	6	28	2	140°	30°	6537	66	5xD
MD 2070330				3.3	m6	23.1	6	30	2	140°	30°		72	7xD
	MD 421033 IC			3.3	m7	26.4	6	34	2	140°	30°	6537	72	8xD
MD 404034				3.4	h7	10.2	3.4	20	2	140°	30°	6539	52	3xD 2)
MD 423034	MD 406034 IC			3.4	m7	10.2	6	20	2	140°	30°	6537	62	3xD
MD 3050340				3.4	k6	17	6	24	3	130°	30°	6537	66	5xD 3)
MD 424034	MD 408034 IC			3.4	m7	17	6	28	2	140°	30°	6537	66	5xD

1) Lieferbar in 0.01-Schritten | Livrable de 1/100 en 1/100 | Available in 0.01-steps

Mindestbestellmenge 10 Stück | Commande minimale de 10 pièces | Minimum order quantity 10 pieces

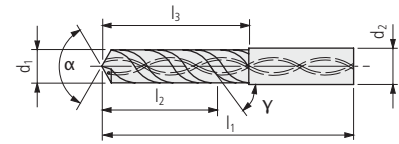
2) Extra kurz | Extra court | Extra short

3) Für Aluminium | Pour aluminium | For aluminium

Legende | Légende | Legend

Bohren | Perçage | Drilling

Fortsetzung | Suite | Continuation



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide 		Dimensionen Dimensions Dimensions										Bemerkung Remarque Comment
				d1	Tol.	l2	d2	l3	z	α	γ	DIN	l1	
MD ...														
														
														
Ohne Innenkühlung Sans lubrification central Without internal cooling	Mit Innenkühlung Avec lubrification central With internal cooling (... IC)	...	UHM 10 HX											
MD 2070340			■	3.4	m6	23.8	6	34	2	140°	30°		72	7xD
	MD 421034 IC		■	3.4	m7	27.2	6	34	2	140°	30°	6537	72	8xD
MD 404035			■	3.5	h7	10.5	3.5	20	2	140°	30°	6539	52	3xD 2)
MD 423035	MD 406035 IC		■	3.5	m7	10.5	6	20	2	140°	30°	6537	62	3xD
MD 3050350		■		3.5	k6	17.5	6	26	3	130°	30°	6537	66	5xD 3)
MD 424035	MD 408035 IC		■	3.5	m7	17.5	6	28	2	140°	30°	6537	66	5xD
MD 2070350			■	3.5	m6	24.5	6	34	2	140°	30°		72	7xD
	MD 421035 IC		■	3.5	m7	28	6	34	2	140°	30°	6537	72	8xD
	MD 2090350 IC		■	3.5	m7	31.5	4	46	2	140°	30°		80	9xD
	MD 2120350 IC		■	3.5	m7	42	4	56	2	140°	30°		95	12xD
	MD 2150350 IC		■	3.5	m7	52.5	4	66	2	140°	30°		105	15xD
MD 404036			■	3.6	h7	10.8	3.6	20	2	140°	30°	6539	52	3xD 2)
MD 423036	MD 406036 IC		■	3.6	m7	10.8	6	20	2	140°	30°	6537	62	3xD
MD 3050360		■		3.6	k6	18	6	26	3	130°	30°	6537	66	5xD 3)
MD 424036	MD 408036 IC		■	3.6	m7	18	6	28	2	140°	30°	6537	66	5xD
MD 2070360			■	3.6	m6	25.2	6	34	2	140°	30°		72	7xD
	MD 421036 IC		■	3.6	m7	28.8	6	34	2	140°	30°	6537	72	8xD
MD 404037			■	3.7	h7	11.1	3.7	20	2	140°	30°	6539	52	3xD 2)
MD 423037	MD 406037 IC		■	3.7	m7	11.1	6	20	2	140°	30°	6537	62	3xD
MD 3050370		■		3.7	k6	18.5	6	26	3	130°	30°	6537	66	5xD 3)
MD 424037	MD 408037 IC		■	3.7	m7	18.5	6	28	2	140°	30°	6537	66	5xD
MD 2070370			■	3.7	m6	25.9	6	34	2	140°	30°		72	7xD
	MD 421037 IC		■	3.7	m7	29.6	6	34	2	140°	30°	6537	72	8xD
MD 404038			■	3.8	h7	11.4	3.8	22	2	140°	30°	6539	55	3xD 2)
MD 423038	MD 406038 IC		■	3.8	m7	11.4	6	24	2	140°	30°	6537	66	3xD
MD 3050380		■		3.8	k6	19	6	28	3	130°	30°	6537	74	5xD 3)
MD 424038	MD 408038 IC		■	3.8	m7	19	6	36	2	140°	30°	6537	74	5xD
MD 2070380			■	3.8	m6	26.6	6	34	2	140°	30°		81	7xD
	MD 421038 IC		■	3.8	m7	30.4	6	43	2	140°	30°	6537	81	8xD
MD 404039			■	3.9	h7	11.7	3.9	22	2	140°	30°	6539	55	3xD 2)
MD 423039	MD 406039 IC		■	3.9	m7	11.7	6	24	2	140°	30°	6537	66	3xD
MD 3050390		■		3.9	k6	19.5	6	28	3	130°	30°	6537	74	5xD 3)
MD 424039	MD 408039 IC		■	3.9	m7	19.5	6	36	2	140°	30°	6537	74	5xD
MD 2070390			■	3.9	m6	27.3	6	38	2	140°	30°		81	7xD
	MD 421039 IC		■	3.9	m7	31.2	6	43	2	140°	30°	6537	81	8xD
MD 404040			■	4	h7	12	4	22	2	140°	30°	6539	55	3xD 2)
MD 423040	MD 406040 IC		■	4	m7	12	6	24	2	140°	30°	6537	66	3xD
MD 3050400		■		4	k6	20	6	28	3	130°	30°	6537	74	5xD 3)
MD 424040	MD 408040 IC		■	4	m7	20	6	36	2	140°	30°	6537	74	5xD
MD 2070400			■	4	m6	28	6	38	2	140°	30°		81	7xD
	MD 421040 IC		■	4	m7	32	6	43	2	140°	30°	6537	81	8xD
	MD 2090400 IC		■	4	m7	36	6	52	2	140°	30°		95	9xD
	MD 2120400 IC		■	4	m7	48	6	64	2	140°	30°		102	12xD
	MD 2150400 IC		■	4	m7	60	6	76	2	140°	30°		115	15xD
MD 404041			■	4.1	h7	12.3	4.1	22	2	140°	30°	6539	55	3xD 2)
MD 423041	MD 406041 IC		■	4.1	m7	12.3	6	24	2	140°	30°	6537	66	3xD
MD 3050410		■		4.1	k6	20.5	6	30	3	130°	30°	6537	74	5xD 3)
MD 424041	MD 408041 IC		■	4.1	m7	20.5	6	36	2	140°	30°	6537	74	5xD

1) Lieferbar in 0.01-Schritten | Livrable de 1/100 en 1/100 | Available in 0.01-steps

Mindestbestellmenge 10 Stück | Commande minimale de 10 pièces | Minimum order quantity 10 pieces

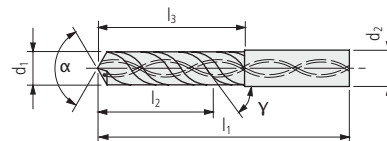
2) Extra kurz | Extra court | Extra short

3) Für Aluminium | Pour aluminium | For aluminium

Legende | Légende | Legend 

Bohren | Perçage | Drilling

Fortsetzung | Suite | Continuation



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide		Dimensionen Dimensions Dimensions										Bemerkung Remarque Comment	
				d ₁	Tol.	l ₂	d ₂	l ₃	z	α	γ	DIN	l ₁		
MD ...															
Ohne Innenkühlung Sans lubrification central Without internal cooling		Mit Innenkühlung Avec lubrification central With internal cooling (... IC)													
															
															
															
															
															
															
															
															
															
															
															
															
															
															
															
															
															
															
															
															
															
															
															
															
															
															
															
															
															
															
															
															
															
															
															
															
															
															
															
															
															
															
															
															
															
															
															
															
															

1) Lieferbar in 0.01-Schritten | Livrable de 1/100 en 1/100 | Available in 0.01-steps

Mindestbestellmenge 10 Stück | Commande minimale de 10 pièces | Minimum order quantity 10 pieces

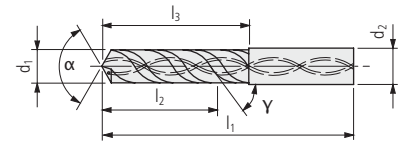
2) Extra kurz | Extra court | Extra short

3) Für Aluminium | Pour aluminium | For aluminium

Legende | Légende | Legend  4

Bohren | Perçage | Drilling

Fortsetzung | Suite | Continuation



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide 		Dimensionen Dimensions Dimensions										Bemerkung Remarque Comment
MD ...		   	   	d1	Tol.	l2	d2	l3	z	α	γ	DIN	l1	
Ohne Innenkühlung Sans lubrification central Without internal cooling	Mit Innenkühlung Avec lubrification central With internal cooling (... IC)	... UHM 10	... UHM 10 HX											
MD 423049	MD 406049 IC		■	4.9	m7	14.7	6	28	2	140°	30°	6537	66	3xD
MD 3050490		■		4.9	k6	24.5	6	36	3	130°	30°	6537	82	5xD 3)
MD 424049	MD 408049 IC		■	4.9	m7	24.5	6	44	2	140°	30°	6537	82	5xD
MD 2070490			■	4.9	m6	34.3	6	47	2	140°	30°		95	7xD
	MD 421049 IC		■	4.9	m7	39.2	6	57	2	140°	30°	6537	95	8xD
MD 404050			■	5	h7	15	5	26	2	140°	30°	6539	62	3xD 2)
MD 423050	MD 406050 IC		■	5	m7	15	6	28	2	140°	30°	6537	66	3xD
MD 3050500		■		5	k6	25	6	36	3	130°	30°	6537	82	5xD 3)
MD 424050	MD 408050 IC		■	5	m7	25	6	44	2	140°	30°	6537	82	5xD
MD 2070500			■	5	m6	35	6	47	2	140°	30°		95	7xD
	MD 421050 IC		■	5	m7	40	6	57	2	140°	30°	6537	95	8xD
	MD 2090500 IC		■	5	m7	45	6	65	2	140°	30°		102	9xD
	MD 2120500 IC		■	5	m7	60	6	80	2	140°	30°		125	12xD
	MD 2150500 IC		■	5	m7	75	6	96	2	140°	30°		140	15xD
MD 404051			■	5.1	h7	15.3	5.1	26	2	140°	30°	6539	62	3xD 2)
MD 423051	MD 406051 IC		■	5.1	m7	15.3	6	28	2	140°	30°	6537	66	3xD
MD 3050510		■		5.1	k6	25.5	6	36	3	130°	30°	6537	82	5xD 3)
MD 424051	MD 408051 IC		■	5.1	m7	25.5	6	44	2	140°	30°	6537	82	5xD
MD 2070510			■	5.1	m6	35.7	6	47	2	140°	30°		95	7xD
	MD 421051 IC		■	5.1	m7	40.8	6	57	2	140°	30°	6537	95	8xD
MD 404052			■	5.2	h7	15.6	5.2	26	2	140°	30°	6539	62	3xD 2)
MD 423052	MD 406052 IC		■	5.2	m7	15.6	6	28	2	140°	30°	6537	66	3xD
MD 3050520		■		5.2	k6	26	6	38	3	130°	30°	6537	82	5xD 3)
MD 424052	MD 408052 IC		■	5.2	m7	26	6	44	2	140°	30°	6537	82	5xD
MD 2070520			■	5.2	m6	36.4	6	47	2	140°	30°		95	7xD
	MD 421052 IC		■	5.2	m7	41.6	6	57	2	140°	30°	6537	95	8xD
MD 404053			■	5.3	h7	15.9	5.3	26	2	140°	30°	6539	62	3xD 2)
MD 423053	MD 406053 IC		■	5.3	m7	15.9	6	28	2	140°	30°	6537	66	3xD
MD 3050530		■		5.3	k6	26.5	6	38	3	130°	30°	6537	82	5xD 3)
MD 424053	MD 408053 IC		■	5.3	m7	26.5	6	44	2	140°	30°	6537	82	5xD
MD 2070530			■	5.3	m6	37.1	6	47	2	140°	30°		95	7xD
	MD 421053 IC		■	5.3	m7	42.4	6	57	2	140°	30°	6537	95	8xD
MD 404054			■	5.4	h7	16.2	5.4	28	2	140°	30°	6539	66	3xD 2)
MD 423054	MD 406054 IC		■	5.4	m7	16.2	6	28	2	140°	30°	6537	66	3xD
MD 3050540		■		5.4	k6	27	6	38	3	130°	30°	6537	82	5xD 3)
MD 424054	MD 408054 IC		■	5.4	m7	27	6	44	2	140°	30°	6537	82	5xD
MD 2070540			■	5.4	m6	37.8	6	52	2	140°	30°		95	7xD
	MD 421054 IC		■	5.4	m7	43.2	6	57	2	140°	30°	6537	95	8xD
MD 404055			■	5.5	h7	16.5	5.5	28	2	140°	30°	6539	66	3xD 2)
MD 423055	MD 406055 IC		■	5.5	m7	16.5	6	28	2	140°	30°	6537	66	3xD
MD 3050550		■		5.5	k6	27.5	6	40	3	130°	30°	6537	82	5xD 3)
MD 424055	MD 408055 IC		■	5.5	m7	27.5	6	44	2	140°	30°	6537	82	5xD
MD 2070550			■	5.5	m6	38.5	6	52	2	140°	30°		95	7xD
	MD 421055 IC		■	5.5	m7	44	6	57	2	140°	30°	6537	95	8xD
	MD 2090550 IC		■	5.5	m7	49.5	6	72	2	140°	30°		115	9xD
	MD 2120550 IC		■	5.5	m7	66	6	88	2	140°	30°		125	12xD
MD 404056			■	5.6	h7	16.8	5.6	28	2	140°	30°	6539	66	3xD 2)
MD 423056	MD 406056 IC		■	5.6	m7	16.8	6	28	2	140°	30°	6537	66	3xD

1) Lieferbar in 0.01-Schritten | Livrable de 1/100 en 1/100 | Available in 0.01-steps

Mindestbestellmenge 10 Stück | Commande minimale de 10 pièces | Minimum order quantity 10 pieces

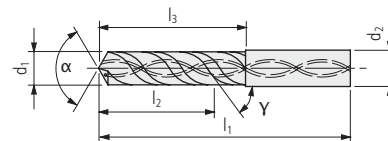
2) Extra kurz | Extra court | Extra short

3) Für Aluminium | Pour aluminium | For aluminium

Legende | Légende | Legend 

Bohren | Perçage | Drilling

Fortsetzung | Suite | Continuation



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide 		Dimensionen Dimensions Dimensions										Bemerkung Remarque Comment
				d1	Tol.	l2	d2	l3	z	α	γ	DIN	l1	
MD ...							h6							
Ohne Innenkühlung Sans lubrification central Without internal cooling	Mit Innenkühlung Avec lubrification central With internal cooling (... IC)	...	...											
MD 3050560		■	■	5.6	k6	28	6	40	3	130°	30°	6537	82	5xD 3)
MD 424056	MD 408056 IC		■	5.6	m7	28	6	44	2	140°	30°	6537	82	5xD
MD 2070560			■	5.6	m6	39.2	6	52	2	140°	30°		95	7xD
	MD 421056 IC		■	5.6	m7	44.8	6	57	2	140°	30°	6537	95	8xD
MD 404057			■	5.7	h7	17.1	5.7	28	2	140°	30°	6539	66	3xD 2)
MD 423057	MD 406057 IC		■	5.7	m7	17.1	6	28	2	140°	30°	6537	66	3xD
MD 3050570		■		5.7	k6	28.5	6	40	3	130°	30°	6537	82	5xD 3)
MD 424057	MD 408057 IC		■	5.7	m7	28.5	6	44	2	140°	30°	6537	82	5xD
MD 2070570			■	5.7	m6	39.9	6	52	2	140°	30°		95	7xD
	MD 421057 IC		■	5.7	m7	45.6	6	57	2	140°	30°	6537	95	8xD
MD 404058			■	5.8	h7	17.4	5.8	28	2	140°	30°	6539	66	3xD 2)
MD 423058	MD 406058 IC		■	5.8	m7	17.4	6	28	2	140°	30°	6537	66	3xD
MD 3050580		■		5.8	k6	29	6	42	3	130°	30°	6537	82	5xD 3)
MD 424058	MD 408058 IC		■	5.8	m7	29	6	44	2	140°	30°	6537	82	5xD
MD 2070580			■	5.8	m6	40.6	6	54	2	140°	30°		95	7xD
	MD 421058 IC		■	5.8	m7	46.4	6	57	2	140°	30°	6537	95	8xD
MD 404059			■	5.9	h7	17.7	5.9	28	2	140°	30°	6539	66	3xD 2)
MD 423059	MD 406059 IC		■	5.9	m7	17.7	6	28	2	140°	30°	6537	66	3xD
MD 3050590		■		5.9	k6	29.5	6	42	3	130°	30°	6537	82	5xD 3)
MD 424059	MD 408059 IC		■	5.9	m7	29.5	6	44	2	140°	30°	6537	82	5xD
MD 2070590			■	5.9	m6	41.3	6	54	2	140°	30°		95	7xD
	MD 421059 IC		■	5.9	m7	47.2	6	57	2	140°	30°	6537	95	8xD
MD 404060			■	6	h7	18	6	28	2	140°	30°	6539	66	3xD 2)
MD 423060	MD 406060 IC		■	6	m7	18	6	28	2	140°	30°	6537	66	3xD
MD 3050600		■		6	k6	30	6	42	3	130°	30°	6537	82	5xD 3)
MD 424060	MD 408060 IC		■	6	m7	30	6	44	2	140°	30°	6537	82	5xD
MD 2070600			■	6	m6	42	6	54	2	140°	30°		95	7xD
	MD 421060 IC		■	6	m7	48	6	57	2	140°	30°	6537	95	8xD
	MD 2090600 IC		■	6	m7	54	6	78	2	140°	30°		125	9xD
	MD 2120600 IC		■	6	m7	72	6	96	2	140°	30°		140	12xD
MD 404061			■	6.1	h7	18.3	6.1	31	2	140°	30°	6539	70	3xD 2)
MD 423061	MD 406061 IC		■	6.1	m7	18.3	8	34	2	140°	30°	6537	79	3xD
MD 424061	MD 408061 IC		■	6.1	m7	30.5	8	53	2	140°	30°	6537	91	5xD
	MD 421061 IC		■	6.1	m7	48.8	8	76	2	140°	30°	6537	114	8xD
MD 404062			■	6.2	h7	18.6	6.2	31	2	140°	30°	6539	70	3xD 2)
MD 423062	MD 406062 IC		■	6.2	m7	18.6	8	34	2	140°	30°	6537	79	3xD
MD 424062	MD 408062 IC		■	6.2	m7	31	8	53	2	140°	30°	6537	91	5xD
	MD 421062 IC		■	6.2	m7	49.6	8	76	2	140°	30°	6537	114	8xD
MD 404063			■	6.3	h7	18.9	6.3	31	2	140°	30°	6539	70	3xD 2)
MD 423063	MD 406063 IC		■	6.3	m7	18.9	8	34	2	140°	30°	6537	79	3xD
MD 424063	MD 408063 IC		■	6.3	m7	31.5	8	53	2	140°	30°	6537	91	5xD
	MD 421063 IC		■	6.3	m7	50.4	8	76	2	140°	30°	6537	114	8xD
MD 404064			■	6.4	h7	19.2	6.4	31	2	140°	30°	6539	70	3xD 2)
MD 423064	MD 406064 IC		■	6.4	m7	19.2	8	34	2	140°	30°	6537	79	3xD
MD 424064	MD 408064 IC		■	6.4	m7	32	8	53	2	140°	30°	6537	91	5xD
	MD 421064 IC		■	6.4	m7	51.2	8	76	2	140°	30°	6537	114	8xD
MD 404065			■	6.5	h7	19.5	6.5	31	2	140°	30°	6539	70	3xD 2)
MD 423065	MD 406065 IC		■	6.5	m7	19.5	8	34	2	140°	30°	6537	79	3xD

1) Lieferbar in 0.01-Schritten | Livrable de 1/100 en 1/100 | Available in 0.01-steps

Mindestbestellmenge 10 Stück | Commande minimale de 10 pièces | Minimum order quantity 10 pieces

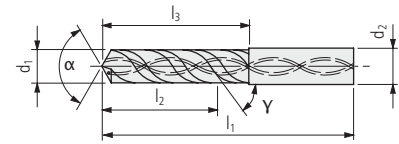
2) Extra kurz | Extra court | Extra short

3) Für Aluminium | Pour aluminium | For aluminium

Legende | Légende | Legend 

Bohren | Perçage | Drilling

Fortsetzung | Suite | Continuation



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide		Dimensionen Dimensions Dimensions										Bemerkung Remarque Comment	
		ISO 532		d ₁	Tol.	l ₂	d ₂	l ₃	z	α	γ	DIN	l ₁		
															
MD ...							h6								
Ohne Innenkühlung Sans lubrification central Without internal cooling	Mit Innenkühlung Avec lubrification central With internal cooling (... IC)	... UHM 10	... UHM 10 HX												
MD 424065	MD 408065 IC		■	6.5	m7	32.5	8	53	2	140°	30°	6537	91	5×D	2)
	MD 421065 IC		■	6.5	m7	52	8	76	2	140°	30°	6537	114	8×D	
MD 404066			■	6.6	h7	19.8	6.6	31	2	140°	30°	6539	70	3×D	
MD 423066	MD 406066 IC		■	6.6	m7	19.8	8	34	2	140°	30°	6537	79	3×D	
MD 424066	MD 408066 IC		■	6.6	m7	33	8	53	2	140°	30°	6537	91	5×D	
	MD 421066 IC		■	6.6	m7	52.8	8	76	2	140°	30°	6537	114	8×D	
MD 404067			■	6.7	h7	20.1	6.7	31	2	140°	30°	6539	70	3×D	2)
MD 423067	MD 406067 IC		■	6.7	m7	20.1	8	34	2	140°	30°	6537	79	3×D	
MD 424067	MD 408067 IC		■	6.7	m7	33.5	8	53	2	140°	30°	6537	91	5×D	
	MD 421067 IC		■	6.7	m7	53.6	8	76	2	140°	30°	6537	114	8×D	
MD 404068			■	6.8	h7	20.4	6.8	34	2	140°	30°	6539	74	3×D	2)
MD 423068	MD 406068 IC		■	6.8	m7	20.4	8	34	2	140°	30°	6537	79	3×D	
MD 424068	MD 408068 IC		■	6.8	m7	34	8	53	2	140°	30°	6537	91	5×D	
	MD 421068 IC		■	6.8	m7	54.4	8	76	2	140°	30°	6537	114	8×D	
MD 404069			■	6.9	h7	20.7	6.9	34	2	140°	30°	6539	74	3×D	2)
MD 423069	MD 406069 IC		■	6.9	m7	20.7	8	34	2	140°	30°	6537	79	3×D	
MD 424069	MD 408069 IC		■	6.9	m7	34.5	8	53	2	140°	30°	6537	91	5×D	
	MD 421069 IC		■	6.9	m7	55.2	8	76	2	140°	30°	6537	114	8×D	
MD 404070			■	7	h7	21	7	34	2	140°	30°	6539	74	3×D	2)
MD 423070	MD 406070 IC		■	7	m7	21	8	34	2	140°	30°	6537	79	3×D	
MD 424070	MD 408070 IC		■	7	m7	35	8	53	2	140°	30°	6537	91	5×D	
	MD 421070 IC		■	7	m7	56	8	76	2	140°	30°	6537	114	8×D	
MD 404071			■	7.1	h7	21.3	7.1	34	2	140°	30°	6539	74	3×D	2)
MD 423071	MD 406071 IC		■	7.1	m7	21.3	8	41	2	140°	30°	6537	79	3×D	
MD 424071	MD 408071 IC		■	7.1	m7	35.5	8	53	2	140°	30°	6537	91	5×D	
	MD 421071 IC		■	7.1	m7	56.8	8	76	2	140°	30°	6537	114	8×D	
MD 404072			■	7.2	h7	21.6	7.2	34	2	140°	30°	6539	74	3×D	2)
MD 423072	MD 406072 IC		■	7.2	m7	21.6	8	41	2	140°	30°	6537	79	3×D	
MD 424072	MD 408072 IC		■	7.2	m7	36	8	53	2	140°	30°	6537	91	5×D	
	MD 421072 IC		■	7.2	m7	57.6	8	76	2	140°	30°	6537	114	8×D	
MD 404073			■	7.3	h7	21.9	7.3	34	2	140°	30°	6539	74	3×D	2)
MD 423073	MD 406073 IC		■	7.3	m7	21.9	8	41	2	140°	30°	6537	79	3×D	
MD 424073	MD 408073 IC		■	7.3	m7	36.5	8	53	2	140°	30°	6537	91	5×D	
	MD 421073 IC		■	7.3	m7	58.4	8	76	2	140°	30°	6537	114	8×D	
MD 404074			■	7.4	h7	22.2	7.4	34	2	140°	30°	6539	74	3×D	2)
MD 423074	MD 406074 IC		■	7.4	m7	22.2	8	41	2	140°	30°	6537	79	3×D	
MD 424074	MD 408074 IC		■	7.4	m7	37	8	53	2	140°	30°	6537	91	5×D	
	MD 421074 IC		■	7.4	m7	59.2	8	76	2	140°	30°	6537	114	8×D	
MD 404075			■	7.5	h7	22.5	7.5	34	2	140°	30°	6539	74	3×D	2)
MD 423075	MD 406075 IC		■	7.5	m7	22.5	8	41	2	140°	30°	6537	79	3×D	
MD 424075	MD 408075 IC		■	7.5	m7	37.5	8	53	2	140°	30°	6537	91	5×D	
	MD 421075 IC		■	7.5	m7	60	8	76	2	140°	30°	6537	114	8×D	
MD 404076			■	7.6	h7	22.8	7.6	37	2	140°	30°	6539	79	3×D	2)
MD 423076	MD 406076 IC		■	7.6	m7	22.8	8	41	2	140°	30°	6537	79	3×D	
MD 424076	MD 408076 IC		■	7.6	m7	38	8	53	2	140°	30°	6537	91	5×D	
	MD 421076 IC		■	7.6	m7	60.8	8	76	2	140°	30°	6537	114	8×D	
MD 404077			■	7.7	h7	23.1	7.7	37	2	140°	30°	6539	79	3×D	2)
MD 423077	MD 406077 IC		■	7.7	m7	23.1	8	41	2	140°	30°	6537	79	3×D	

1) Lieferbar in 0.01-Schritten | Livrable de 1/100 en 1/100 | Available in 0.01-steps

Mindestbestellmenge 10 Stück | Commande minimale de 10 pièces | Minimum order quantity 10 pieces

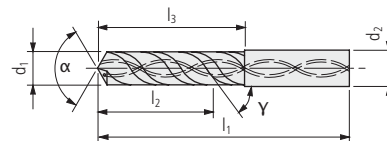
2) Extra kurz | Extra court | Extra short

3) Für Aluminium | Pour aluminium | For aluminium

Legende | Légende | Legend 

Bohren | Perçage | Drilling

Fortsetzung | Suite | Continuation



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide 		Dimensionen Dimensions Dimensions										Bemerkung Remarque Comment
				d1	Tol.	l2	d2	l3	z	α	γ	DIN	l1	
MD ...														
Ohne Innenkühlung Sans lubrification central Without internal cooling		... UHM 10												
Mit Innenkühlung Avec lubrification central With internal cooling (... IC)		... UHM 10 HX												
MD 424077	MD 408077 IC			7.7	m7	38.5	8	53	2	140°	30°	6537	91	5xD
	MD 421077 IC			7.7	m7	61.6	8	76	2	140°	30°	6537	114	8xD
MD 404078				7.8	h7	23.4	7.8	37	2	140°	30°	6539	79	3xD 2)
MD 423078	MD 406078 IC			7.8	m7	23.4	8	41	2	140°	30°	6537	79	3xD
MD 424078	MD 408078 IC			7.8	m7	39	8	53	2	140°	30°	6537	91	5xD
	MD 421078 IC			7.8	m7	62.4	8	76	2	140°	30°	6537	114	8xD
MD 404079				7.9	h7	23.7	7.9	37	2	140°	30°	6539	79	3xD 2)
MD 423079	MD 406079 IC			7.9	m7	23.7	8	41	2	140°	30°	6537	79	3xD
MD 424079	MD 408079 IC			7.9	m7	39.5	8	53	2	140°	30°	6537	91	5xD
	MD 421079 IC			7.9	m7	63.2	8	76	2	140°	30°	6537	114	8xD
MD 404080				8	h7	24	8	37	2	140°	30°	6539	79	3xD 2)
MD 423080	MD 406080 IC			8	m7	24	8	41	2	140°	30°	6537	79	3xD
MD 424080	MD 408080 IC			8	m7	40	8	53	2	140°	30°	6537	91	5xD
	MD 421080 IC			8	m7	64	8	76	2	140°	30°	6537	114	8xD
MD 404081				8.1	h7	24.3	8.1	37	2	140°	30°	6539	79	3xD 2)
MD 423081	MD 406081 IC			8.1	m7	24.3	10	47	2	140°	30°	6537	89	3xD
MD 424081	MD 408081 IC			8.1	m7	40.5	10	61	2	140°	30°	6537	103	5xD
	MD 421081 IC			8.1	m7	64.8	10	95	2	140°	30°	6537	142	8xD
MD 404082				8.2	h7	24.6	8.2	37	2	140°	30°	6539	79	3xD 2)
MD 423082	MD 406082 IC			8.2	m7	24.6	10	47	2	140°	30°	6537	89	3xD
MD 424082	MD 408082 IC			8.2	m7	41	10	61	2	140°	30°	6537	103	5xD
	MD 421082 IC			8.2	m7	65.6	10	95	2	140°	30°	6537	142	8xD
MD 404083				8.3	h7	24.9	8.3	37	2	140°	30°	6539	79	3xD 2)
MD 423083	MD 406083 IC			8.3	m7	24.9	10	47	2	140°	30°	6537	89	3xD
MD 424083	MD 408083 IC			8.3	m7	41.5	10	61	2	140°	30°	6537	103	5xD
	MD 421083 IC			8.3	m7	66.4	10	95	2	140°	30°	6537	142	8xD
MD 404084				8.4	h7	25.2	8.4	37	2	140°	30°	6539	79	3xD 2)
MD 423084	MD 406084 IC			8.4	m7	25.2	10	47	2	140°	30°	6537	89	3xD
MD 424084	MD 408084 IC			8.4	m7	42	10	61	2	140°	30°	6537	103	5xD
	MD 421084 IC			8.4	m7	67.2	10	95	2	140°	30°	6537	142	8xD
MD 404085				8.5	h7	25.5	8.5	37	2	140°	30°	6539	79	3xD 2)
MD 423085	MD 406085 IC			8.5	m7	25.5	10	47	2	140°	30°	6537	89	3xD
MD 424085	MD 408085 IC			8.5	m7	42.5	10	61	2	140°	30°	6537	103	5xD
	MD 421085 IC			8.5	m7	68	10	95	2	140°	30°	6537	142	8xD
MD 404086				8.6	h7	25.8	8.6	40	2	140°	30°	6539	84	3xD 2)
MD 423086	MD 406086 IC			8.6	m7	25.8	10	47	2	140°	30°	6537	89	3xD
MD 424086	MD 408086 IC			8.6	m7	43	10	61	2	140°	30°	6537	103	5xD
	MD 421086 IC			8.6	m7	68.8	10	95	2	140°	30°	6537	142	8xD
MD 404087				8.7	h7	26.1	8.7	40	2	140°	30°	6539	84	3xD 2)
MD 423087	MD 406087 IC			8.7	m7	26.1	10	47	2	140°	30°	6537	89	3xD
MD 424087	MD 408087 IC			8.7	m7	43.5	10	61	2	140°	30°	6537	103	5xD
	MD 421087 IC			8.7	m7	69.6	10	95	2	140°	30°	6537	142	8xD
MD 404088				8.8	h7	26.4	8.8	40	2	140°	30°	6539	84	3xD 2)
MD 423088	MD 406088 IC			8.8	m7	26.4	10	47	2	140°	30°	6537	89	3xD
MD 424088	MD 408088 IC			8.8	m7	44	10	61	2	140°	30°	6537	103	5xD
	MD 421088 IC			8.8	m7	70.4	10	95	2	140°	30°	6537	142	8xD
MD 404089				8.9	h7	26.7	8.9	40	2	140°	30°	6539	84	3xD 2)
MD 423089	MD 406089 IC			8.9	m7	26.7	10	47	2	140°	30°	6537	89	3xD

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Mindestbestellmenge 10 Stück | Commande minimale de 10 pièces | Minimum order quantity 10 pieces

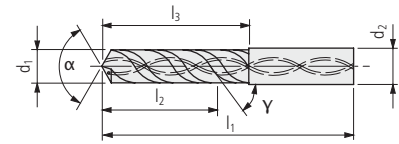
2) Extra kurz | Extra court | Extra short

3) Für Aluminium | Pour aluminium | For aluminium

Legende | Légende | Legend 

Bohren | Perçage | Drilling

Fortsetzung | Suite | Continuation



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide 		Dimensionen Dimensions Dimensions										Bemerkung Remarque Comment
				d ₁	Tol.	l ₂	d ₂	l ₃	z	α	γ	DIN	l ₁	
														
MD ...														
														
Ohne Innenkühlung Sans lubrification central Without internal cooling	Mit Innenkühlung Avec lubrification central With internal cooling (... IC)	... UHM 10	... UHM 10 HX											
MD 424089	MD 408089 IC		■	8.9	m7	44.5	10	61	2	140°	30°	6537	103	5×D
	MD 421089 IC		■	8.9	m7	71.2	10	95	2	140°	30°	6537	142	8×D
MD 404090			■	9	h7	27	9	40	2	140°	30°	6539	84	3×D 2)
MD 423090	MD 406090 IC		■	9	m7	27	10	47	2	140°	30°	6537	89	3×D
MD 424090	MD 408090 IC		■	9	m7	45	10	61	2	140°	30°	6537	103	5×D
	MD 421090 IC		■	9	m7	72	10	95	2	140°	30°	6537	142	8×D
MD 404091			■	9.1	h7	27.3	9.1	40	2	140°	30°	6539	84	3×D 2)
MD 423091	MD 406091 IC		■	9.1	m7	27.3	10	47	2	140°	30°	6537	89	3×D
MD 424091	MD 408091 IC		■	9.1	m7	45.5	10	61	2	140°	30°	6537	103	5×D
	MD 421091 IC		■	9.1	m7	72.8	10	95	2	140°	30°	6537	142	8×D
MD 404092			■	9.2	h7	27.6	9.2	40	2	140°	30°	6539	84	3×D 2)
MD 423092	MD 406092 IC		■	9.2	m7	27.6	10	47	2	140°	30°	6537	89	3×D
MD 424092	MD 408092 IC		■	9.2	m7	46	10	61	2	140°	30°	6537	103	5×D
	MD 421092 IC		■	9.2	m7	73.6	10	95	2	140°	30°	6537	142	8×D
MD 404093			■	9.3	h7	27.9	9.3	40	2	140°	30°	6539	84	3×D 2)
MD 423093	MD 406093 IC		■	9.3	m7	27.9	10	47	2	140°	30°	6537	89	3×D
MD 424093	MD 408093 IC		■	9.3	m7	46.5	10	61	2	140°	30°	6537	103	5×D
	MD 421093 IC		■	9.3	m7	74.4	10	95	2	140°	30°	6537	142	8×D
MD 404094			■	9.4	h7	28.2	9.4	40	2	140°	30°	6539	84	3×D 2)
MD 423094	MD 406094 IC		■	9.4	m7	28.2	10	47	2	140°	30°	6537	89	3×D
MD 424094	MD 408094 IC		■	9.4	m7	47	10	61	2	140°	30°	6537	103	5×D
	MD 421094 IC		■	9.4	m7	75.2	10	95	2	140°	30°	6537	142	8×D
MD 404095			■	9.5	h7	28.5	9.5	40	2	140°	30°	6539	84	3×D 2)
MD 423095	MD 406095 IC		■	9.5	m7	28.5	10	47	2	140°	30°	6537	89	3×D
MD 424095	MD 408095 IC		■	9.5	m7	47.5	10	61	2	140°	30°	6537	103	5×D
	MD 421095 IC		■	9.5	m7	76	10	95	2	140°	30°	6537	142	8×D
MD 404096			■	9.6	h7	28.8	9.6	43	2	140°	30°	6539	89	3×D 2)
MD 423096	MD 406096 IC		■	9.6	m7	28.8	10	47	2	140°	30°	6537	89	3×D
MD 424096	MD 408096 IC		■	9.6	m7	48	10	61	2	140°	30°	6537	103	5×D
	MD 421096 IC		■	9.6	m7	76.8	10	95	2	140°	30°	6537	142	8×D
MD 404097			■	9.7	h7	29.1	9.7	43	2	140°	30°	6539	89	3×D 2)
MD 423097	MD 406097 IC		■	9.7	m7	29.1	10	47	2	140°	30°	6537	89	3×D
MD 424097	MD 408097 IC		■	9.7	m7	48.5	10	61	2	140°	30°	6537	103	5×D
	MD 421097 IC		■	9.7	m7	77.6	10	95	2	140°	30°	6537	142	8×D
MD 404098			■	9.8	h7	29.4	9.8	43	2	140°	30°	6539	89	3×D 2)
MD 423098	MD 406098 IC		■	9.8	m7	29.4	10	47	2	140°	30°	6537	89	3×D
MD 424098	MD 408098 IC		■	9.8	m7	49	10	61	2	140°	30°	6537	103	5×D
	MD 421098 IC		■	9.8	m7	78.4	10	95	2	140°	30°	6537	142	8×D
MD 404099			■	9.9	h7	29.7	9.9	43	2	140°	30°	6539	89	3×D 2)
MD 423099	MD 406099 IC		■	9.9	m7	29.7	10	47	2	140°	30°	6537	89	3×D
MD 424099	MD 408099 IC		■	9.9	m7	49.5	10	61	2	140°	30°	6537	103	5×D
	MD 421099 IC		■	9.9	m7	79.2	10	95	2	140°	30°	6537	142	8×D
MD 404100			■	10	h7	30	10	43	2	140°	30°	6539	89	3×D 2)
MD 423100	MD 406100 IC		■	10	m7	30	10	47	2	140°	30°	6537	89	3×D
MD 424100	MD 408100 IC		■	10	m7	50	10	61	2	140°	30°	6537	103	5×D
	MD 421100 IC		■	10	m7	80	10	95	2	140°	30°	6537	142	8×D
MD 423101	MD 406101 IC		■	10.1	m7	30.3	12	55	2	140°	30°	6537	102	3×D
MD 424101	MD 408101 IC		■	10.1	m7	50.5	12	71	2	140°	30°	6537	118	5×D

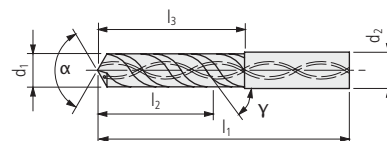
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Mindestbestellmenge 10 Stück | Commande minimale de 10 pièces | Minimum order quantity 10 pieces

2) Extra kurz | Extra court | Extra short

3) Für Aluminium | Pour aluminium | For aluminium

Legende | Légende | Legend 



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide 		Dimensionen Dimensions Dimensions										Bemerkung Remarque Comment
MD ...				d1	Tol.	l2	d2	l3	z	α	γ	DIN	l1	
Ohne Innenkühlung Sans lubrification central Without internal cooling	Mit Innenkühlung Avec lubrification central With internal cooling (... IC)													
		...	...											
	MD 421101 IC			10.1	m7	80.8	12	114	2	140°	30°	6537	162	8xD
MD 404102				10.2	h7	30.6	10.2	43	2	140°	30°	6539	89	3xD 2)
MD 423102	MD 406102 IC			10.2	m7	30.6	12	55	2	140°	30°	6537	102	3xD
MD 424102	MD 408102 IC			10.2	m7	51	12	71	2	140°	30°	6537	118	5xD
	MD 421102 IC			10.2	m7	81.6	12	114	2	140°	30°	6537	162	8xD
MD 423103	MD 406103 IC			10.3	m7	30.9	12	55	2	140°	30°	6537	102	3xD
MD 424103	MD 408103 IC			10.3	m7	51.5	12	71	2	140°	30°	6537	118	5xD
	MD 421103 IC			10.3	m7	82.4	12	114	2	140°	30°	6537	162	8xD
MD 423104	MD 406104 IC			10.4	m7	31.2	12	55	2	140°	30°	6537	102	3xD
MD 424104	MD 408104 IC			10.4	m7	52	12	71	2	140°	30°	6537	118	5xD
	MD 421104 IC			10.4	m7	83.2	12	114	2	140°	30°	6537	162	8xD
MD 404105				10.5	h7	31.5	10.5	43	2	140°	30°	6539	89	3xD 2)
MD 423105	MD 406105 IC			10.5	m7	31.5	12	55	2	140°	30°	6537	102	3xD
MD 424105	MD 408105 IC			10.5	m7	52.5	12	71	2	140°	30°	6537	118	5xD
	MD 421105 IC			10.5	m7	84	12	114	2	140°	30°	6537	162	8xD
MD 423106	MD 406106 IC			10.6	m7	31.8	12	55	2	140°	30°	6537	102	3xD
MD 424106	MD 408106 IC			10.6	m7	53	12	71	2	140°	30°	6537	118	5xD
	MD 421106 IC			10.6	m7	84.8	12	114	2	140°	30°	6537	162	8xD
MD 423107	MD 406107 IC			10.7	m7	32.1	12	55	2	140°	30°	6537	102	3xD
MD 424107	MD 408107 IC			10.7	m7	53.5	12	71	2	140°	30°	6537	118	5xD
	MD 421107 IC			10.7	m7	85.6	12	114	2	140°	30°	6537	162	8xD
MD 423108	MD 406108 IC			10.8	m7	32.4	12	55	2	140°	30°	6537	102	3xD
MD 424108	MD 408108 IC			10.8	m7	54	12	71	2	140°	30°	6537	118	5xD
	MD 421108 IC			10.8	m7	86.4	12	114	2	140°	30°	6537	162	8xD
MD 423109	MD 406109 IC			10.9	m7	32.7	12	55	2	140°	30°	6537	102	3xD
MD 424109	MD 408109 IC			10.9	m7	54.5	12	71	2	140°	30°	6537	118	5xD
	MD 421109 IC			10.9	m7	87.2	12	114	2	140°	30°	6537	162	8xD
MD 404110				11	h7	33	11	47	2	140°	30°	6539	95	3xD 2)
MD 423110	MD 406110 IC			11	m7	33	12	55	2	140°	30°	6537	102	3xD
MD 424110	MD 408110 IC			11	m7	55	12	71	2	140°	30°	6537	118	5xD
	MD 421110 IC			11	m7	88	12	114	2	140°	30°	6537	162	8xD
MD 423111	MD 406111 IC			11.1	m7	33.3	12	55	2	140°	30°	6537	102	3xD
MD 424111	MD 408111 IC			11.1	m7	55.5	12	71	2	140°	30°	6537	118	5xD
	MD 421111 IC			11.1	m7	88.8	12	114	2	140°	30°	6537	162	8xD
MD 423112	MD 406112 IC			11.2	m7	33.6	12	55	2	140°	30°	6537	102	3xD
MD 424112	MD 408112 IC			11.2	m7	56	12	71	2	140°	30°	6537	118	5xD
	MD 421112 IC			11.2	m7	89.6	12	114	2	140°	30°	6537	162	8xD
MD 423113	MD 406113 IC			11.3	m7	33.9	12	55	2	140°	30°	6537	102	3xD
MD 424113	MD 408113 IC			11.3	m7	56.5	12	71	2	140°	30°	6537	118	5xD
	MD 421113 IC			11.3	m7	90.4	12	114	2	140°	30°	6537	162	8xD
MD 423114	MD 406114 IC			11.4	m7	34.2	12	55	2	140°	30°	6537	102	3xD
MD 424114	MD 408114 IC			11.4	m7	57	12	71	2	140°	30°	6537	118	5xD
	MD 421114 IC			11.4	m7	91.2	12	114	2	140°	30°	6537	162	8xD
MD 404115				11.5	h7	34.5	11.5	47	2	140°	30°	6539	95	3xD 2)
MD 423115	MD 406115 IC			11.5	m7	34.5	12	55	2	140°	30°	6537	102	3xD
MD 424115	MD 408115 IC			11.5	m7	57.5	12	71	2	140°	30°	6537	118	5xD
	MD 421115 IC			11.5	m7	92	12	114	2	140°	30°	6537	162	8xD
MD 423116	MD 406116 IC			11.6	m7	34.8	12	55	2	140°	30°	6537	102	3xD

1) Lieferbar in 0.01-Schritten | Livrable de 1/100 en 1/100 | Available in 0.01-steps

Mindestbestellmenge 10 Stück | Commande minimale de 10 pièces | Minimum order quantity 10 pieces

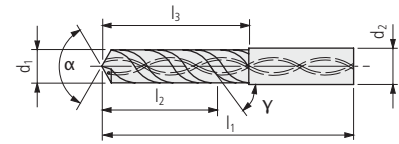
2) Extra kurz | Extra court | Extra short

3) Für Aluminium | Pour aluminium | For aluminium

Legende | Légende | Legend  4

Bohren | Perçage | Drilling

Fortsetzung | Suite | Continuation



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide 		Dimensionen Dimensions Dimensions										Bemerkung Remarque Comment
				d1	Tol.	l2	d2	l3	z	α	γ	DIN	l1	
MD ...														
							h6							
														
Ohne Innenkühlung Sans lubrification central Without internal cooling	Mit Innenkühlung Avec lubrification central With internal cooling (... IC)	... UHM 10	... UHM 10 HX											
MD 424116	MD 408116 IC		■	11.6	m7	58	12	71	2	140°	30°	6537	118	5xD
	MD 421116 IC		■	11.6	m7	92.8	12	114	2	140°	30°	6537	162	8xD
MD 423117	MD 406117 IC		■	11.7	m7	35.1	12	55	2	140°	30°	6537	102	3xD
MD 424117	MD 408117 IC		■	11.7	m7	58.5	12	71	2	140°	30°	6537	118	5xD
	MD 421117 IC		■	11.7	m7	93.6	12	114	2	140°	30°	6537	162	8xD
MD 423118	MD 406118 IC		■	11.8	m7	35.4	12	55	2	140°	30°	6537	102	3xD
MD 424118	MD 408118 IC		■	11.8	m7	59	12	71	2	140°	30°	6537	118	5xD
	MD 421118 IC		■	11.8	m7	94.4	12	114	2	140°	30°	6537	162	8xD
MD 423119	MD 406119 IC		■	11.9	m7	35.7	12	55	2	140°	30°	6537	102	3xD
MD 424119	MD 408119 IC		■	11.9	m7	59.5	12	71	2	140°	30°	6537	118	5xD
	MD 421119 IC		■	11.9	m7	95.2	12	114	2	140°	30°	6537	162	8xD
MD 404120			■	12	h7	36	12	51	2	140°	30°	6539	102	3xD 2)
MD 423120	MD 406120 IC		■	12	m7	36	12	55	2	140°	30°	6537	102	3xD
MD 424120	MD 408120 IC		■	12	m7	60	12	71	2	140°	30°	6537	118	5xD
	MD 421120 IC		■	12	m7	96	12	114	2	140°	30°	6537	162	8xD
MD 423123			■	12.3	m7	36.9	14	60	2	140°	30°	6537	107	3xD
MD 424123			■	12.3	m7	61.5	14	77	2	140°	30°	6537	124	5xD
MD 423125	MD 406125 IC		■	12.5	m7	37.5	14	60	2	140°	30°	6537	107	3xD
MD 424125	MD 408125 IC		■	12.5	m7	62.5	14	77	2	140°	30°	6537	124	5xD
MD 423128			■	12.8	m7	38.4	14	60	2	140°	30°	6537	109	3xD
MD 424128			■	12.8	m7	64	14	77	2	140°	30°	6537	124	5xD
MD 404130			■	13	h7	39	13	51	2	140°	30°	6539	102	3xD 2)
MD 423130	MD 406130 IC		■	13	m7	39	14	60	2	140°	30°	6537	107	3xD
MD 424130	MD 408130 IC		■	13	m7	65	14	77	2	140°	30°	6537	124	5xD
MD 404135			■	13.5	h7	40.5	13.5	54	2	140°	30°	6539	107	3xD 2)
MD 423135	MD 406135 IC		■	13.5	m7	40.5	14	60	2	140°	30°	6537	107	3xD
MD 424135	MD 408135 IC		■	13.5	m7	67.5	14	77	2	140°	30°	6537	124	5xD
MD 423138			■	13.8	m7	41.4	14	60	2	140°	30°	6537	107	3xD
MD 424138			■	13.8	m7	69	14	77	2	140°	30°	6537	124	5xD
MD 404140			■	14	h7	42	14	54	2	140°	30°	6539	107	3xD 2)
MD 423140	MD 406140 IC		■	14	m7	42	14	60	2	140°	30°	6537	107	3xD
MD 424140	MD 408140 IC		■	14	m7	70	14	77	2	140°	30°	6537	124	5xD
MD 404145			■	14.5	h7	43.5	14.5	56	2	140°	30°	6539	111	3xD 2)
MD 423145	MD 406145 IC		■	14.5	m7	43.5	16	65	2	140°	30°	6537	115	3xD
MD 424145	MD 408145 IC		■	14.5	m7	72.5	16	83	2	140°	30°	6537	133	5xD
MD 423148			■	14.8	m7	44.4	16	65	2	140°	30°	6537	115	3xD
MD 424148			■	14.8	m7	74	16	83	2	140°	30°	6537	133	5xD
MD 404150			■	15	h7	45	15	56	2	140°	30°	6539	111	3xD 2)
MD 423150	MD 406150 IC		■	15	m7	45	16	65	2	140°	30°	6537	115	3xD
MD 424150	MD 408150 IC		■	15	m7	75	16	83	2	140°	30°	6537	133	5xD
MD 404155			■	15.5	h7	46.5	15.5	58	2	140°	30°	6539	115	3xD 2)
MD 423155	MD 406155 IC		■	15.5	m7	46.5	16	65	2	140°	30°	6537	115	3xD
MD 424155	MD 408155 IC		■	15.5	m7	77.5	16	83	2	140°	30°	6537	133	5xD
MD 423158			■	15.8	m7	47.4	16	65	2	140°	30°	6537	115	3xD
MD 424158			■	15.8	m7	79	16	83	2	140°	30°	6537	133	5xD
MD 404160			■	16	h7	48	16	58	2	140°	30°	6539	115	3xD 2)
MD 423160	MD 406160 IC		■	16	m7	48	16	65	2	140°	30°	6537	115	3xD
MD 424160	MD 408160 IC		■	16	m7	80	16	83	2	140°	30°	6537	133	5xD

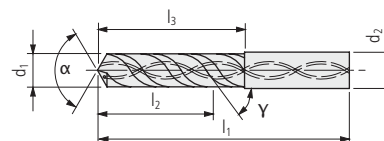
1) Lieferbar in 0.01-Schritten | Livrable de 1/100 en 1/100 | Available in 0.01-steps

Mindestbestellmenge 10 Stück | Commande minimale de 10 pièces | Minimum order quantity 10 pieces

2) Extra kurz | Extra court | Extra short

3) Für Aluminium | Pour aluminium | For aluminium

Legende | Légende | Legend 



Bezeichnung Désignation Designation		Hartmetall Carbure Carbide	352	Dimensionen Dimensions Dimensions										Bemerkung Remarque Comment
MD ...		●	●	d1	Tol.	l2	d2	l3	z	α	γ	DIN	l1	
Ohne Innenkühlung Sans lubrification central Without internal cooling		○	○				h6							
Mit Innenkühlung Avec lubrification central With internal cooling (... IC)		○	○											
MD ...		●	○											
UHM 10		...	UHM 10 HX											
MD 404165		■	■	16.5	h7	49.5	16.5	60	2	140°	30°	6539	119	3xD 2)
MD 423165	MD 406165 IC	■	■	16.5	m7	49.5	18	73	2	140°	30°	6537	123	3xD
MD 424165	MD 408165 IC	■	■	16.5	m7	82.5	18	93	2	140°	30°	6537	143	5xD
MD 423168		■	■	16.8	m7	50.4	18	73	2	140°	30°	6537	123	3xD
MD 424168		■	■	16.8	m7	84	18	93	2	140°	30°	6537	143	5xD
MD 404170		■	■	17	h7	51	17	60	2	140°	30°	6539	119	3xD 2)
MD 423170	MD 406170 IC	■	■	17	m7	51	18	73	2	140°	30°	6537	123	3xD
MD 424170	MD 408170 IC	■	■	17	m7	85	18	93	2	140°	30°	6537	143	5xD
MD 404175		■	■	17.5	h7	52.5	17.5	62	2	140°	30°	6539	123	3xD 2)
MD 423175	MD 406175 IC	■	■	17.5	m7	52.5	18	73	2	140°	30°	6537	123	3xD
MD 424175	MD 408175 IC	■	■	17.5	m7	87.5	18	93	2	140°	30°	6537	143	5xD
MD 423178		■	■	17.8	m7	53.4	18	73	2	140°	30°	6537	123	3xD
MD 424178		■	■	17.8	m7	89	18	93	2	140°	30°	6537	143	5xD
MD 404180		■	■	18	h7	54	18	62	2	140°	30°	6539	123	3xD 2)
MD 423180	MD 406180 IC	■	■	18	m7	54	18	73	2	140°	30°	6537	123	3xD
MD 424180	MD 408180 IC	■	■	18	m7	90	18	93	2	140°	30°	6537	143	5xD
MD 404185		■	■	18.5	h7	55.5	18.5	64	2	140°	30°	6539	127	3xD 2)
MD 423185	MD 406185 IC	■	■	18.5	m7	55.5	20	79	2	140°	30°	6537	131	3xD
MD 424185	MD 408185 IC	■	■	18.5	m7	92.5	20	101	2	140°	30°	6537	153	5xD
MD 404190		■	■	19	h7	57	19	64	2	140°	30°	6539	127	3xD 2)
MD 423190	MD 406190 IC	■	■	19	m7	57	20	79	2	140°	30°	6537	131	3xD
MD 424190	MD 408190 IC	■	■	19	m7	95	20	101	2	140°	30°	6537	153	5xD
MD 404195		■	■	19.5	h7	58.5	19.5	66	2	140°	30°	6539	131	3xD 2)
MD 423195	MD 406195 IC	■	■	19.5	m7	58.5	20	79	2	140°	30°	6537	131	3xD
MD 424195	MD 408195 IC	■	■	19.5	m7	97.5	20	101	2	140°	30°	6537	153	5xD
MD 423198		■	■	19.8	m7	59.4	20	79	2	140°	30°	6537	131	3xD
MD 424198		■	■	19.8	m7	99	20	101	2	140°	30°	6537	153	5xD
MD 404200		■	■	20	h7	60	20	66	2	140°	30°	6539	131	3xD 2)
MD 423200	MD 406200 IC	■	■	20	m7	60	20	79	2	140°	30°	6537	131	3xD
MD 424200	MD 408200 IC	■	■	20	m7	100	20	101	2	140°	30°	6537	153	5xD

1) Lieferbar in 0.01-Schritten | Livrable de 1/100 en 1/100 | Available in 0.01-steps

Mindestbestellmenge 10 Stück | Commande minimale de 10 pièces | Minimum order quantity 10 pieces

2) Extra kurz | Extra court | Extra short

3) Für Aluminium | Pour aluminium | For aluminium

Werkstoffe | Matières | Materials

	Stahl unlegiert Acier non allié Steel unalloyed	Stahl niedriglegiert Acier faibl. allié Steel low alloyed	Stahl hochlegiert Acier fortem. allié Steel high alloyed	Titan Titane Titanium
Härte (HB) Dureté (HB) Hardness value (HB)	125–300	180–250	200–350	–
Kategorie Catégorie Category	I	II	III	IV
Bearbeitung Usinage Machining method	▼▼	▼▼	▼▼	▼▼

Schnittgeschwindigkeiten (v_c) | Vitesses de coupe (v_c) | Cutting speeds (v_c)

	v _c (m/min)		v _c (m/min)		v _c (m/min)		v _c (m/min)	
MD 20...–42...								
Schneidstoff Hartmetall Matériaux de coupe carbure Cutting material carbide	MD 209... IC MD 212... IC MD 215... IC	alle anderen tous les autres all others	MD 209... IC MD 212... IC MD 215... IC	alle anderen tous les autres all others	MD 209... IC MD 212... IC MD 215... IC	alle anderen tous les autres all others	MD 209... IC MD 212... IC MD 215... IC	alle anderen tous les autres all others
UHM 10	–	70–120	–	60–80	–	30–50	–	40–60
UHM 10 HX	20–50	80–150	20–40	60–135	30–50	40–80	–	–

Werkstoffe | Matières | Materials

	Rostfreier Stahl Acier inoxydable Stainless steel	Rostfreier Stahl Acier inoxydable Stainless steel	Aluminium Aluminium Aluminium	Messing Laiton Brass
Härte (HB) Dureté (HB) Hardness value (HB)	180–220	220–330	60–130	–
Kategorie Catégorie Category	V	VI	VII	VIII
Bearbeitung Usinage Machining method	▼▼	▼▼	▼▼	▼▼

Schnittgeschwindigkeiten (v_c) | Vitesses de coupe (v_c) | Cutting speeds (v_c)

	v _c (m/min)		v _c (m/min)		v _c (m/min)		v _c (m/min)	
MD 20...–42...								
Schneidstoff Hartmetall Matériaux de coupe carbure Cutting material carbide	MD 209... IC MD 212... IC MD 215... IC	alle anderen tous les autres all others	MD 209... IC MD 212... IC MD 215... IC	alle anderen tous les autres all others	MD 209... IC MD 212... IC MD 215... IC	alle anderen tous les autres all others	MD 209... IC MD 212... IC MD 215... IC	alle anderen tous les autres all others
UHM 10	–	25–40	–	10–20	–	50–150	–	60–100
UHM 10 HX	20–40	30–60	10–30	15–30	–	–	–	–

Vorschübe (f) | Avances (f) | Feeds (f)

	Stahl unlegiert Acier non allié Steel unalloyed (I)		Stahl niedriglegiert Acier faibl. allié Steel low alloyed (II)		Stahl hochlegiert Acier fortem. allié Steel high alloyed (III)		Titan Titane Titanium (IV)	
MD 20...	f (mm/U mm/tr mm/rev)		f (mm/U mm/tr mm/rev)		f (mm/U mm/tr mm/rev)		f (mm/U mm/tr mm/rev)	
d (mm)	MD 203... MD 205... MD 207...	MD 209... IC MD 212... IC MD 215... IC	MD 203... MD 205... MD 207...	MD 209... IC MD 212... IC MD 215... IC	MD 203... MD 205... MD 207...	MD 209... IC MD 212... IC MD 215... IC	MD 203... MD 205... MD 207...	MD 209... IC MD 212... IC MD 215... IC
<1	0.01–0.08	–	0.01–0.08	–	0.005–0.06	–	–	–
1	0.08–0.12	<0.04	0.08–0.12	<0.04	0.07–0.08	<0.03	–	–
1.5	0.18–0.2	<0.05	0.23–0.25	<0.05	0.12–0.14	<0.04	–	–
2	0.23–0.25	<0.06	0.27–0.28	<0.05	0.18–0.2	<0.04	–	–
2.5	0.25–0.27	<0.08	0.27–0.3	<0.06	0.21–0.23	<0.05	–	–
3–3.5	0.32–0.35	<0.11	0.32–0.35	<0.08	0.23–0.25	<0.07	–	–
4–4.5	–	<0.14	–	<0.11	–	<0.1	–	–
5–6	–	<0.2	–	<0.16	–	<0.15	–	–

MD 25...	f (mm/U mm/tr mm/rev)		f (mm/U mm/tr mm/rev)		f (mm/U mm/tr mm/rev)		f (mm/U mm/tr mm/rev)	
d (mm)	MD 250... MD 251... MD 252...	–	MD 250... MD 251... MD 252...	–	MD 250... MD 251... MD 252...	–	MD 250... MD 251... MD 252...	–
<1	0.003–0.009	–	0.003–0.01	–	0.003–0.01	–	0.003–0.007	–
1	0.006–0.015	–	0.006–0.015	–	0.006–0.015	–	0.005–0.01	–
2	0.01–0.03	–	0.01–0.02	–	0.01–0.02	–	0.005–0.01	–
<3	0.01–0.03	–	0.01–0.02	–	0.01–0.02	–	0.005–0.01	–

MD 30...	f (mm/U mm/tr mm/rev)		f (mm/U mm/tr mm/rev)		f (mm/U mm/tr mm/rev)		f (mm/U mm/tr mm/rev)	
d (mm)	MD 305...	–	MD 305...	–	MD 305...	–	MD 305...	–
<1	–	–	–	–	–	–	–	–
1	–	–	–	–	–	–	–	–
1.5	–	–	–	–	–	–	–	–
2	–	–	–	–	–	–	–	–
2.5	–	–	–	–	–	–	–	–
3	–	–	–	–	–	–	–	–
4	–	–	–	–	–	–	–	–
5	–	–	–	–	–	–	–	–
6	–	–	–	–	–	–	–	–

MD 40.../42...	f (mm/U mm/tr mm/rev)		f (mm/U mm/tr mm/rev)		f (mm/U mm/tr mm/rev)		f (mm/U mm/tr mm/rev)	
d (mm)	MD 404... MD 423... MD 424...	MD 408... IC MD 406... IC MD 421... IC	MD 404... MD 423... MD 424...	MD 408... IC MD 406... IC MD 421... IC	MD 404... MD 423... MD 424...	MD 408... IC MD 406... IC MD 421... IC	MD 404... MD 423... MD 424...	MD 408... IC MD 406... IC MD 421... IC
1	–	0.05	–	0.05	–	–	–	–
2	–	0.07	–	0.07	–	–	–	–
3	0.13	0.16	0.13	0.16	–	–	–	–
4	0.14	0.17	0.14	0.17	–	–	–	–
5	0.15	0.18	0.15	0.18	–	–	–	–
6	0.17	0.20	0.17	0.20	–	–	–	–
7	0.19	0.22	0.19	0.22	–	–	–	–
8	0.21	0.24	0.21	0.24	–	–	–	–
9	0.23	0.27	0.23	0.27	–	–	–	–
10	0.25	0.30	0.25	0.30	–	–	–	–
12	0.27	0.33	0.27	0.33	–	–	–	–
14	0.29	0.36	0.29	0.36	–	–	–	–
16	0.31	0.39	0.31	0.39	–	–	–	–
18	0.33	0.42	0.33	0.42	–	–	–	–
20	0.35	0.45	0.35	0.45	–	–	–	–

Empfehlung: Vorschubverringering für MD408 und MD424 15% und MD421 30%.
Recommandation: Réduction de l'avance pour MD408 et MD424 15% et MD421 30%.
Recommendation: Feed reduction for MD408 and MD424 15% and MD421 30%.

Vorschübe (f) | Avances (f) | Feeds (f)

	Rostfreier Stahl Acier inoxydable Stainless steel (V)		Rostfreier Stahl Acier inoxydable Stainless steel (VI)		Aluminium Aluminium Aluminium (VII)		Messing Laiton Brass (VIII)	
MD 20...	f (mm/U mm/tr mm/rev)		f (mm/U mm/tr mm/rev)		f (mm/U mm/tr mm/rev)		f (mm/U mm/tr mm/rev)	
d (mm)	MD 203... MD 205... MD 207...	MD 209... IC MD 212... IC MD 215... IC	MD 203... MD 205... MD 207...	MD 209... IC MD 212... IC MD 215... IC	MD 203... MD 205... MD 207...	MD 209... IC MD 212... IC MD 215... IC	MD 203... MD 205... MD 207...	MD 209... IC MD 212... IC MD 215... IC
<1	0.006–0.07	–	0.006–0.07	–	–	–	–	–
1	0.08–0.11	<0.05	0.08–0.11	<0.03	–	–	–	–
1.5	0.18–0.2	<0.06	0.18–0.2	<0.03	–	–	–	–
2	0.23–0.25	<0.06	0.23–0.25	<0.03	–	–	–	–
2.5	0.25–0.28	<0.08	0.25–0.28	<0.05	–	–	–	–
3–3.5	0.27–0.3	<0.09	0.27–0.3	<0.07	–	–	–	–
4–4.5	–	<0.12	–	<0.1	–	–	–	–
5–6	–	<0.18	–	<0.15	–	–	–	–

	f (mm/U mm/tr mm/rev)		f (mm/U mm/tr mm/rev)		f (mm/U mm/tr mm/rev)		f (mm/U mm/tr mm/rev)	
MD 25...	f (mm/U mm/tr mm/rev)		f (mm/U mm/tr mm/rev)		f (mm/U mm/tr mm/rev)		f (mm/U mm/tr mm/rev)	
d (mm)	MD 250... MD 251... MD 252...	–	MD 250... MD 251... MD 252...	–	MD 250... MD 251... MD 252...	–	MD 250... MD 251... MD 252...	–
<1	0.003–0.01	–	0.003–0.01	–	0.01–0.04	–	0.03–0.06	–
1	0.006–0.015	–	0.006–0.015	–	0.01–0.05	–	0.03–0.06	–
2	0.01–0.02	–	0.01–0.02	–	0.01–0.1	–	0.03–0.06	–
<3	0.01–0.02	–	0.01–0.02	–	0.01–0.2	–	0.03–0.06	–

	f (mm/U mm/tr mm/rev)		f (mm/U mm/tr mm/rev)		f (mm/U mm/tr mm/rev)		f (mm/U mm/tr mm/rev)	
MD 30...	f (mm/U mm/tr mm/rev)		f (mm/U mm/tr mm/rev)		f (mm/U mm/tr mm/rev)		f (mm/U mm/tr mm/rev)	
d (mm)	MD 305...	–	MD 305...	–	MD 305... 1) 2)	–	MD 305...	–
<1	–	–	–	–	< 0.04 < 0.15	–	–	–
1	–	–	–	–	< 0.05 < 0.2	–	–	–
1.5	–	–	–	–	< 0.1 < 0.25	–	–	–
2	–	–	–	–	< 0.2 < 0.3	–	–	–
2.5	–	–	–	–	< 0.2 < 0.4	–	–	–
3	–	–	–	–	< 0.2 < 0.5	–	–	–
4	–	–	–	–	< 0.25 < 0.6	–	–	–
5	–	–	–	–	< 0.3 < 0.7	–	–	–
6	–	–	–	–	< 0.3 < 0.8	–	–	–

	f (mm/U mm/tr mm/rev)		f (mm/U mm/tr mm/rev)		f (mm/U mm/tr mm/rev)		f (mm/U mm/tr mm/rev)	
MD 40.../42...	f (mm/U mm/tr mm/rev)		f (mm/U mm/tr mm/rev)		f (mm/U mm/tr mm/rev)		f (mm/U mm/tr mm/rev)	
d (mm)	MD 404... MD 423... MD 424...	MD 408... IC MD 406... IC MD 421... IC	MD 404... MD 423... MD 424...	MD 408... IC MD 406... IC MD 421... IC	MD 404... MD 423... MD 424...	MD 408... IC MD 406... IC MD 421... IC	MD 404... MD 423... MD 424...	MD 408... IC MD 406... IC MD 421... IC
1	–	0.03	–	0.03	–	–	–	–
2	–	0.04	–	0.04	–	–	–	–
3	0.13	0.16	0.13	0.16	0.07	0.1	0.07	0.1
4	0.14	0.17	0.14	0.17	0.08	0.11	0.08	0.11
5	0.15	0.18	0.15	0.18	0.09	0.13	0.09	0.13
6	0.17	0.20	0.17	0.20	0.1	0.14	0.1	0.14
7	0.19	0.22	0.19	0.22	0.11	0.15	0.11	0.15
8	0.21	0.24	0.21	0.24	0.12	0.17	0.12	0.17
9	0.23	0.27	0.23	0.27	0.13	0.18	0.13	0.18
10	0.25	0.30	0.25	0.30	0.15	0.21	0.15	0.21
12	0.27	0.33	0.27	0.33	0.17	0.24	0.17	0.24
14	0.29	0.36	0.29	0.36	0.19	0.27	0.19	0.27
16	0.31	0.39	0.31	0.39	0.21	0.29	0.21	0.29
18	0.33	0.42	0.33	0.42	0.23	0.32	0.23	0.32
20	0.35	0.45	0.35	0.45	0.25	0.35	0.25	0.35

Empfehlung: Vorschubverringering für MD408 und MD424 15% und MD421 30%.
Recommandation: Réduction de l'avance pour MD408 et MD424 15% et MD421 30%.
Recommendation: Feed reduction for MD408 and MD424 15% and MD421 30%.

1) Legierung | Alliage | Alloy 2) Guss | Fonte | Casting

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MULTIDEC®-BACKTOOLS

Kurzbeschreibung Gamme de produits Product line		355
Aufbau Assemblage Mounting		356
Grundhalter Porte-outils de base Basic tool holders		357
Halter Porte-outils Holders		358
Spannzangen- und Werkzeughalter Porte-pinces et porte-outils Collet holders and tool holders		369
Zwischenplatten Intermédiaires Spacer		370
Ersatzteile Pièces de rechange Spare parts		371

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Multidec®-Backtools ist ein Produkteprogramm für die Rückseitenbearbeitung bei Langdrehautomaten mit Gegenspindel. Somit ist eine komplette Bearbeitung in einem Arbeitsgang möglich. Dieses System zeichnet sich durch seine Stabilität, Modularität und einzigartig durch seine einfache Feineinstellung der Spitzenhöhe aus.

La ligne Multidec®-Backtools est destinée à l'usinage des pièces de décolletage, en contre broche. Un usinage complet de la pièce est tout à fait réalisable grâce au système Backtools. Cet outillage se distingue par sa modularité, sa stabilité et par son réglage unique et précis du centrage de l'outil.

Multidec®-Backtools will be utilized for machining with counter spindle on automatic lathes. This tool makes it possible to machine a part completely within a single operation. The special tool distinguishes itself by stability, modularity and unique fixing system. Center height adjustment is made simple by employing the use of a simple excentric adjustment screw.



Vorteile

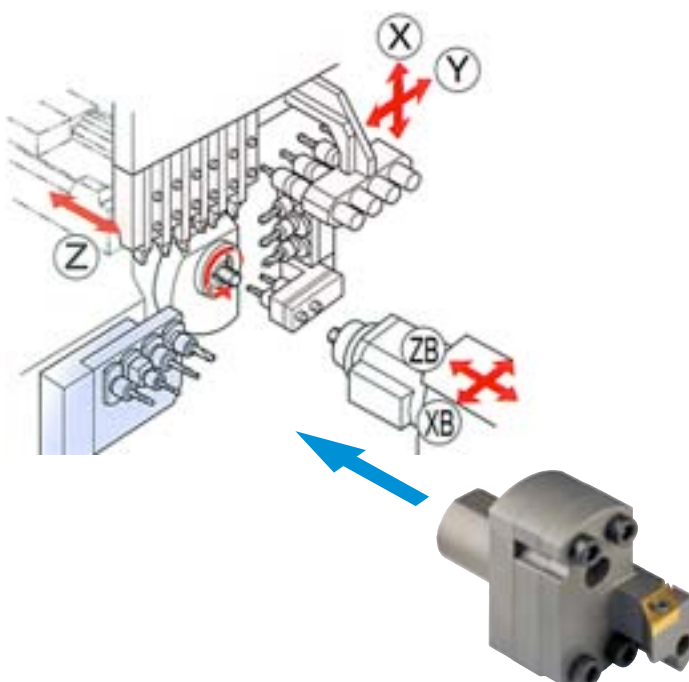
- Komplette Bearbeitung in einem Arbeitsgang möglich
- Hohe Stabilität
- Modularer Aufbau
 - Grundhalter
 - Zwischenplatte
 - Schneidenhalter
- Exakte und komfortable Feineinstellung der Spitzenhöhe mittels Exzentrerschraube (± 0.5 mm)
- Auch mit Innenkühlung erhältlich
- Grundhalter für alle gängigen Maschinen

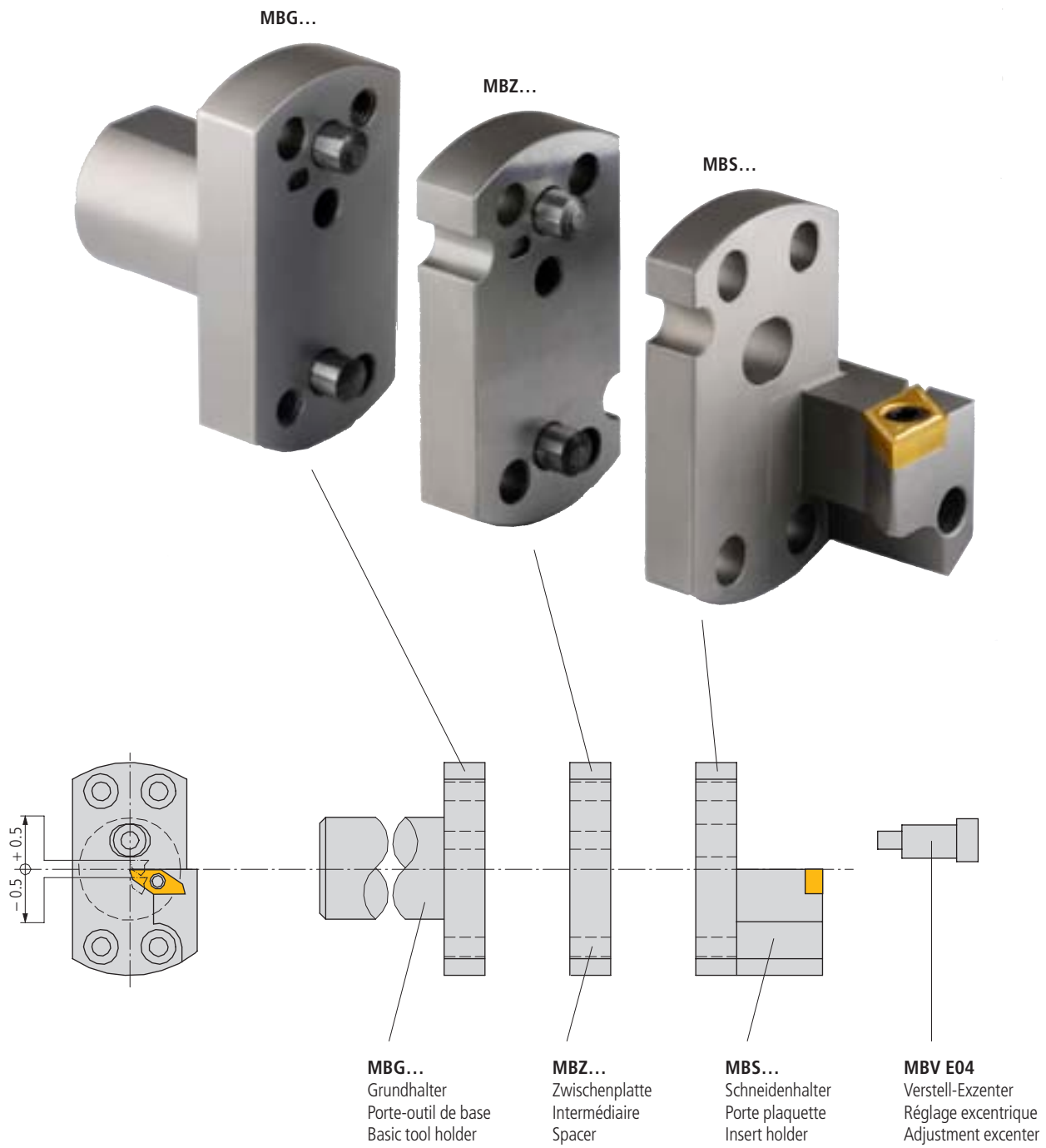
Avantages

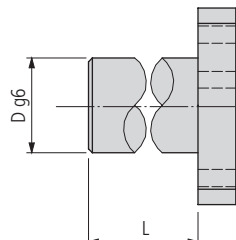
- Sortie pièce de la machine, entièrement terminée.
- Grande stabilité
- Montage modulaire
 - Embase
 - Entretoise
 - Porte plaquette
- Grande facilité de réglage fin du centrage de l'arête de coupe (± 0.5 mm)
- Disponible également avec la lubrification centrale intégrée
- Embase disponible pour toutes les marques de machines

Advantages

- Complete machining in a single operation is possible
- High stability
- Modular design
 - Basic tool holder
 - Spacer
 - Insert holder
- Exact and comfortable adjustment of height of center by excenter screw (± 0.5 mm)
- Internal cooling possible
- Basic tool holder for common machines

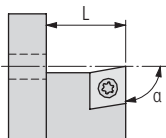
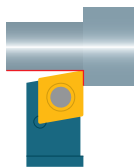




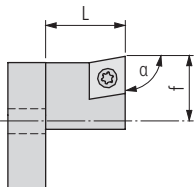


Maschinen-Typ Types de machines Type of machine		Form Forme Shape	Dimensionen Dimensions Dimensions		Bezeichnung Désignation Designation	Zwischenplatte Intermédiaire Spacer	Schneidenhalter Porte plaquette Insert holder
			D g6	L	MBG...	MBZ...	MBS...
CITIZEN	C16, L20, M16		¾" (19.05)	60	MBG 1905 060 B02	■	MBZ ST 02- ... MBS ... I02
	C32, L32, M32		1" (25.4)	70	MBG 2540 070 B02	■	MBZ ST 02- ... MBS ... I02
	K16		20	100	MBG 2000 100 B02	■	MBZ ST 02- ... MBS ... I02
HANWHA	SL12H		20	40	MBG 2200 040 B02	□	MBZ ST 02- ... MBS ... I02
	STL32/35H und J		25	60	MBG 2500 060 B02	□	MBZ ST 02- ... MBS ... I02
	SL26/35HPD		28	6	MBG 2800 006 B02	□	MBZ ST 02- ... MBS ... I02
	XD20/32 H und J		33	40	MBG 3300 040 B02	■	MBZ ST 02- ... MBS ... I02
	SL20/26/35HPH		34	44	MBG 3400 044 B02	□	MBZ ST 02- ... MBS ... I02
MAIER	ML12C, ML16C und D, ML20/26/32		34	30	MBG 3400 030 B04 IC	■	MBZ ST 02- ... MBS ... I02
MANURHIN	Swing 7-20/7-26		25	100	MBG 2500 100 B02	■	MBZ ST 02- ... MBS ... I02
STAR	SA16, SB16		22	70	MBG 2200 070 B02	■	MBZ ST 02- ... MBS ... I02
	SR10J		16	10	MBG 1600 010 B05	■	MBZ ST 05- ... MBS ... C05
	SR10J		22	15	MBG 2200 015 B06	■	MBZ ST 06- ... MBS ... C06
	SR10J, SR20R, ECAS 12/20, SR32J *		22	25	MBG 2200 025F B02	■	MBZ ST 02- ... MBS ... I02
	SR16, SR20		16	21	MBG 1600 021 B01	■	MBZ ST 02- ... MBS ... I02
	SR32, SR32J		22	25	MBG 2200 025 B03	■	MBZ ST 02- ... MBS ... I02
TORNOS	DECO (7, 10, 13, 20)		20	100	MBG 2000 100 B02	■	MBZ ST 02- ... MBS ... I02
	DECO (7, 10, 13, 20)		25	100	MBG 2500 100 B02	■	MBZ ST 02- ... MBS ... I02
TRAUB	TNL/C 12, TNL/C 12K		28	78	MBG 2800 078 B02	□	MBZ ST 02- ... MBS ... I02

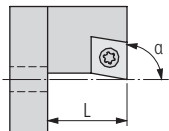
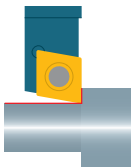
* Gültig ab Maschinennummer ...161 | Valable de no. de machine ...161 | Valid from machine number ...161



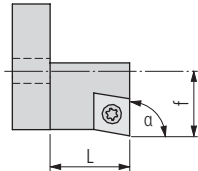
Ausführung Exécution Execution	Dimensionen Dimensions Dimensions			Bezeichnung Désignation Designation		Grundhalter Porte-outil de base Basic tool holder MBG...	Zwischenplatte Intermédiaire Spacer MBZ...	Schneiden Plaquettes Inserts
	α	f	L					
				MBS...				□ 108...
	90°	0	20	MBS 090-CC L 06 I02	■	MBG ... B02	MBZ ST 02- ...	CC.. 0602...
	90°	0	20	MBS 090-CC L 09 I02	■	MBG ... B02	MBZ ST 02- ...	CC.. 09T3...
	93°	0	20	MBS 093-CC L 09 I02	■	MBG ... B02	MBZ ST 02- ...	CC.. 09T3...



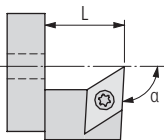
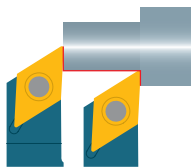
Ausführung Exécution Execution	Dimensionen Dimensions Dimensions			Bezeichnung Désignation Designation		Grundhalter Porte-outil de base Basic tool holder MBG...	Zwischenplatte Intermédiaire Spacer MBZ...	Schneiden Plaquettes Inserts
	α	f	L					
				MBS...				□ 108...
	95°	16	20	MBS 095-CC LA 09 I02	■	MBG ... B02	MBZ ST 02- ...	CC.. 09T3...



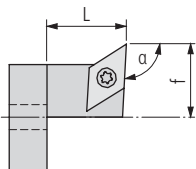
Ausführung Exécution Execution	Dimensionen Dimensions Dimensions			Bezeichnung Désignation Designation		Grundhalter Porte-outil de base Basic tool holder MBG...	Zwischenplatte Intermédiaire Spacer MBZ...	Schneiden Plaquettes Inserts □ 108...
	α	f	L					
	90°	0	20	MBS 090-CC R 06 I02	■	MBG ... B02	MBZ ST 02- ...	CC.. 0602...
	90°	0	20	MBS 090-CC R 09 I02	■	MBG ... B02	MBZ ST 02- ...	CC.. 09T3...
	93°	0	20	MBS 093-CC R 09 I02	■	MBG ... B02	MBZ ST 02- ...	CC.. 09T3...



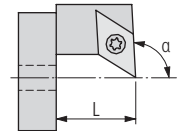
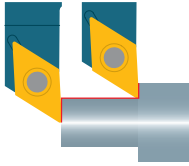
Ausführung Exécution Execution	Dimensionen Dimensions Dimensions			Bezeichnung Désignation Designation		Grundhalter Porte-outil de base Basic tool holder MBG...	Zwischenplatte Intermédiaire Spacer MBZ...	Schneiden Plaquettes Inserts □ 108...
	α	f	L					
	95°	18	20	MBS 095-CC RA 09 I02	■	MBG ... B02	MBZ ST 02- ...	CC.. 09T3...



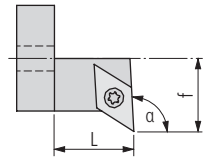
Ausführung Exécution Execution	Dimensionen Dimensions Dimensions			Bezeichnung Désignation Designation		Grundhalter Porte-outil de base Basic tool holder MBG...	Zwischenplatte Intermédiaire Spacer MBZ...	Schneiden Plaquettes Inserts □ 112...
	α	f	L					
	93°	0	20	MBS 093-DC L 07 I02	■	MBG ... B02	MBZ ST 02- ...	DC.. 0702...
	93°	0	20	MBS 093-DC L 11 I02	■	MBG ... B02	MBZ ST 02- ...	DC.. 11T3...



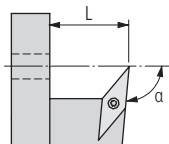
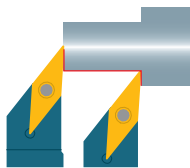
Ausführung Exécution Execution	Dimensionen Dimensions Dimensions			Bezeichnung Désignation Designation		Grundhalter Porte-outil de base Basic tool holder MBG...	Zwischenplatte Intermédiaire Spacer MBZ...	Schneiden Plaquettes Inserts □ 112...
	α	f	L					
	93°	16	20	MBS 093-DC LA 11 I02	■	MBG ... B02	MBZ ST 02- ...	DC.. 11T3...



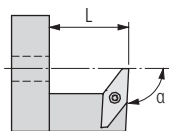
Ausführung Exécution Execution	Dimensionen Dimensions Dimensions			Bezeichnung Désignation Designation		Grundhalter Porte-outil de base Basic tool holder MBG...	Zwischenplatte Intermédiaire Spacer MBZ...	Schneiden Plaquettes Inserts □ 112...
	α	f	L					
	93°	0	20	MBS 093-DC R 07 I02	■	MBG ... B02	MBZ ST 02- ...	DC.. 0702...
	93°	0	20	MBS 093-DC R 11 I02	■	MBG ... B02	MBZ ST 02- ...	DC.. 11T3...



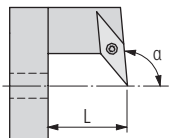
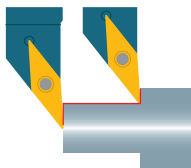
Ausführung Exécution Execution	Dimensionen Dimensions Dimensions			Bezeichnung Désignation Designation		Grundhalter Porte-outil de base Basic tool holder MBG...	Zwischenplatte Intermédiaire Spacer MBZ...	Schneiden Plaquettes Inserts □ 112...
	α	f	L					
	93°	18	20	MBS 093-DC RA 11 I02	■	MBG ... B02	MBZ ST 02- ...	DC.. 11T3...



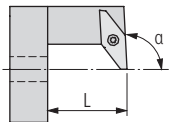
Ausführung Exécution Execution	Dimensionen Dimensions Dimensions			Bezeichnung Désignation Designation		Grundhalter Porte-outil de base Basic tool holder	Zwischenplatte Intermédiaire Spacer	Schneiden Plaquettes Inserts
	α	f	L					
				MBS...		MBG...	MBZ...	118...
	95°	0	20	MBS 095-VC L 11 I02	■	MBG ... B02	MBZ ST 02- ...	VC.. 1103...
	110°	0	20	MBS 110-VC L 11 I02	■	MBG ... B02	MBZ ST 02- ...	VC.. 1103...



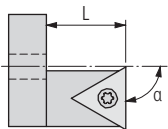
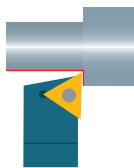
Ausführung Exécution Execution	Dimensionen Dimensions Dimensions			Bezeichnung Désignation Designation		Grundhalter Porte-outil de base Basic tool holder	Zwischenplatte Intermédiaire Spacer	Schneiden Plaquettes Inserts
	α	f	L					
				MBS...		MBG...	MBZ...	122...
	93°	0	20	MBS 093-VP L 10 I02	■	MBG ... B02	MBZ ST 02- ...	VP..1003...



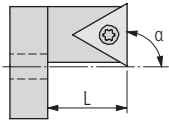
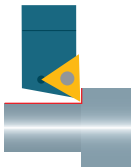
Ausführung Exécution Execution	Dimensionen Dimensions Dimensions			Bezeichnung Désignation Designation		Grundhalter Porte-outil de base Basic tool holder	Zwischenplatte Intermédiaire Spacer	Schneiden Plaquettes Inserts
	α	f	L					
				MBS...		MBG...	MBZ...	□ 118...
	95°	0	20	MBS 095-VC R 11 I02	■	MBG ... B02	MBZ ST 02- ...	VC.. 1103...
	110°	0	20	MBS 110-VC R 11 I02	■	MBG ... B02	MBZ ST 02- ...	VC.. 1103...



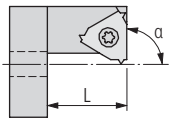
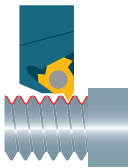
Ausführung Exécution Execution	Dimensionen Dimensions Dimensions			Bezeichnung Désignation Designation		Grundhalter Porte-outil de base Basic tool holder	Zwischenplatte Intermédiaire Spacer	Schneiden Plaquettes Inserts
	α	f	L					
				MBS...		MBG...	MBZ...	□ 122...
	93°	0	20	MBS 093-VP R 10 I02	■	MBG ... B02	MBZ ST 02- ...	VP..1003...



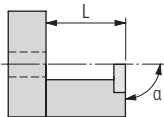
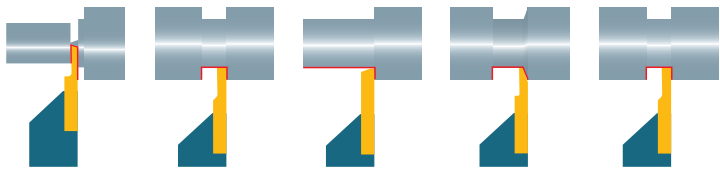
Ausführung Exécution Execution	Dimensionen Dimensions Dimensions			Bezeichnung Désignation Designation		Grundhalter Porte-outil de base Basic tool holder MBG...	Zwischenplatte Intermédiaire Spacer MBZ...	Schneiden Plaquettes Inserts
	α	f	L					
				MBS...				
	90°	0	20	MBS 090-TC L 11 I02	■	MBG ... B02	MBZ ST 02- ...	TC.. 1102...



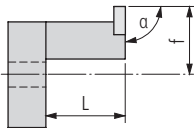
Ausführung Exécution Execution	Dimensionen Dimensions Dimensions			Bezeichnung Désignation Designation		Grundhalter Porte-outil de base Basic tool holder	Zwischenplatte Intermédiaire Spacer	Schneiden Plaquettes Inserts
	α	f	L					
	90°	0	20	MBS...		MBG...	MBZ...	
				MBS 090-TC R 11 I02	■	MBG ... B02	MBZ ST 02- ...	TC.. 1102...



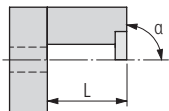
Ausführung Exécution Execution	Dimensionen Dimensions Dimensions			Bezeichnung Désignation Designation		Grundhalter Porte-outil de base Basic tool holder	Zwischenplatte Intermédiaire Spacer	Schneiden Plaquettes Inserts
	α	f	L					
	90°	0	20	MBS...		MBG...	MBZ...	
				MBS 090-16 ER I02	■	MBG ... B02	MBZ ST 02- ...	□ 34... 16ER



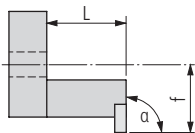
Ausführung Exécution Execution	Dimensionen Dimensions Dimensions			Bezeichnung Désignation Designation		Grundhalter Porte-outil de base Basic tool holder	Zwischenplatte Intermédiaire Spacer	Schneiden Plaquettes Inserts
	α	f	L					
				MBS...		MBG...	MBZ...	□ 36...
	90°	0	21	MBS 090-Cut L 16 I02	■	MBG ... B02	MBZ ST 02- ...	16...



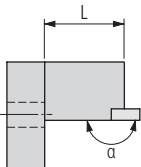
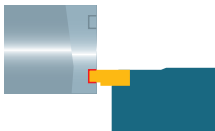
Ausführung Exécution Execution	Dimensionen Dimensions Dimensions			Bezeichnung Désignation Designation		Grundhalter Porte-outil de base Basic tool holder	Zwischenplatte Intermédiaire Spacer	Schneiden Plaquettes Inserts
	α	f	L					
				MBS...		MBG...	MBZ...	□ 36...
	90°	18	21	MBS 090-Cut LA 16 I02	■	MBG ... B02	MBZ ST 02- ...	16...



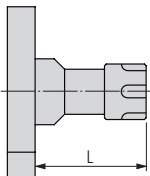
Ausführung Exécution Execution	Dimensionen Dimensions Dimensions			Bezeichnung Désignation Designation		Grundhalter Porte-outil de base Basic tool holder	Zwischenplatte Intermédiaire Spacer	Schneiden Plaquettes Inserts
	α	f	L					
				MBS...		MBG...	MBZ...	$\square$ 36...
	90°	0	21	MBS 090-Cut R 16 I02	■	MBG ... B02	MBZ ST 02- ...	16...



Ausführung Exécution Execution	Dimensionen Dimensions Dimensions			Bezeichnung Désignation Designation		Grundhalter Porte-outil de base Basic tool holder	Zwischenplatte Intermédiaire Spacer	Schneiden Plaquettes Inserts
	α	f	L					
				MBS...		MBG...	MBZ...	$\square$ 36...
	90°	18	21	MBS 090-Cut RA 16 I02	■	MBG ... B02	MBZ ST 02- ...	16...



Ausführung Exécution Execution	Dimensionen Dimensions Dimensions			Bezeichnung Désignation Designation		Grundhalter Porte-outil de base Basic tool holder	Zwischenplatte Intermédiaire Spacer	Schneiden Plaquettes Inserts
	α	f	L					
				MBS...		MBG...	MBZ...	□ 36...
	180°	0	21	MBS 180-Cut 16 I02	■	MBG ... B02	MBZ ST 02- ...	16...

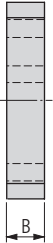


Ausführung Exécution Execution	Typ Type Type	Dimensionen Dimensions Dimensions		Bezeichnung Désignation Designation		Grundhalter Porte-outil de base Basic tool holder MBG...	Zwischenplatte Intermédiaire Spacer MBZ...
		f	L				
N				MBS...			
	ER11	0	43	MBS E11 043 C02	■	MBG ... B02	MBZ ST 02- ...
	ER11	0	43	MBS E11 043 C05	■	MBG ... B05	MBZ ST 05- ...
	ER11	0	43	MBS E11 043 C06	■	MBG ... B06	MBZ ST 06- ...
	ER16	0	43	MBS E16 043 C02	■	MBG ... B02	MBZ ST 02- ...
	ER16	0	43	MBS E16 043 C06	■	MBG ... B06	MBZ ST 06- ...
	ER20	0	43	MBS E20 043 C02	□	MBG ... B02	MBZ ST 02- ...

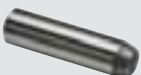
WERKZEUGHALTER
 PORTE-OUTIL
 TOOL HOLDERS



Ausführung Exécution Execution	Dimensionen Dimensions Dimensions		Bezeichnung Désignation Designation		Grundhalter Porte-outil de base Basic tool holder MBG...	Zwischenplatte Intermédiaire Spacer MBZ...	Halter-Typ Type de porte-outil Type of holder
	α	L					
L			MBS...				
	90°	22	MBS 090 1212 T02	■	MBG ... B02	MBZ ST 02- ...	12 × 12



Dimensionen Dimensions Dimensions	Bezeichnung Désignation Designation		Grundhalter Porte-outil de base Basic tool holder	Zwischenplatte Intermédiaire Spacer
B	MBZ...		MBG...	MBZ...
10	MBZ ST 02-10	■	MBG ... B02	MBS ... 02
20	MBZ ST 02-20	■	MBG ... B02	MBS ... 02
30	MBZ ST 02-30	■	MBG ... B02	MBS ... 02
10	MBZ ST 05-10	■	MBG ... B05	MBS ... 05
20	MBZ ST 05-20	■	MBG ... B05	MBS ... 05
10	MBZ ST 06-10	■	MBG ... B06	MBS ... 06
20	MBZ ST 06-20	■	MBG ... B06	MBS ... 06

Abbildung Illustration Illustration	Bezeichnung Désignation Designation	Dimensionen Dimensions Dimensions	Beschreibung Description Description	Schneiden Plaquettes Inserts
	MBV E04		Verstell-Exzenter Réglage excentrique Adjustment excenter	
	MSP A1010 T02	10 × 10	Einlagewinkel Equere compensatoire L-piece für pour for MBS 090 1212 T02	MBS 090 1212 T02
	MSP 25060 T08	M2.5 × 6T08	Torxschraube Vis torx Torx screw	CC06, DC07, TC11, VC11, VP10, 16..
	MSP 35110T15	M3.5 × 11T15		CC09, DC11
	MSP UNC 540070 T10		Schraube für Unterlegplatte Vis de cale Shim screw	16ER
	MSP UNC 540120 T10			16ER
	YE3		Unterlegplatte Cale Anvil 071681	16ER
	MSP M516	M5 × 16 DIN912	Innensechskantschraube Pans creux Allen head screw ohne Zwischenplatte sans intermédiaire without spacer	
	MSP M525	M5 × 25 DIN912	Innensechskantschraube Pans creux Allen head screw mit Zwischenplatte avec intermédiaire with spacer MBZ ST 02-10	
	MSP M535	M5 × 35 DIN912	Innensechskantschraube Pans creux Allen head screw mit Zwischenplatte avec intermédiaire with spacer MBZ ST 02-20	
	MSP M545	M5 × 45 DIN912	Innensechskantschraube Pans creux Allen head screw mit Zwischenplatte avec intermédiaire with spacer MBZ ST 02-30	
	MSP US-5	M5/5.3/9.2/0.45	Spannscheibe Rondelle élastique Elastic washer	
	MSP ZS612	ø6h6 × 12 DIN6325	Zylinderstift Goupille cylindrique Cylindrical pin ohne Zwischenplatte sans intermédiaire without spacer	
	MSP ZS625	ø6h6 × 25 DIN6325	Zylinderstift Goupille cylindrique Cylindrical pin für Zwischenplatte pour intermédiaire for spacer MBZ ST 02-10	
	MSP ZS635	ø6h6 × 35 DIN6325	Zylinderstift Goupille cylindrique Cylindrical pin für Zwischenplatte pour intermédiaire for spacer MBZ ST 02-20	
	MSP ZS645	ø6h6 × 45 DIN6325	Zylinderstift Goupille cylindrique Cylindrical pin für Zwischenplatte pour intermédiaire for spacer MBZ ST 02-30	

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MULTIDEC®-MODULINE

Kurzbeschreibung
Gamme de produits
Product line



375

Werkzeugplatten
Plaque porte-outils
Tool holder plate



376

Halter
Porte-outils
Holders



382

Zubehör
Accessoires
Accessories

393

Voreinstellgerät
Banc de préréglage
Presetting device



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Ersatzteile
Pièces de rechange
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Bearbeitungsmöglichkeiten
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Multidec®-Moduline ist ein vielseitiges, individuelles Werkzeugsystem für Langdrehautomaten verschiedener Maschinenhersteller.

Die längsverzahnte Auflage gewährleistet eine hervorragende Steifigkeit und eine präzise Positionierung. Die Längspositionierung wird durch einen (festen oder verstellbaren) Anschlag bestimmt, dessen Position über eine gefederte Kugel gewährleistet ist.

Die Originalplatte kann durch eine spezifische Moduline-Werkzeugplatte ersetzt werden. Dadurch entsteht ein wesentlicher Gewinn in Bezug auf die Zuverlässigkeit und Schnelligkeit beim Werkzeugwechsel.

Multidec®-Moduline est un système d'outillage modulaire avec une large disponibilité, adaptable aux différentes machines du marché.

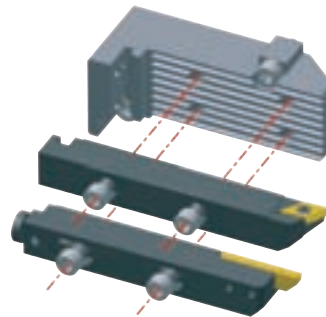
La base d'appui à dentures longitudinales assure une excellente rigidité, ainsi qu'un positionnement précis. Le positionnement en longueur est déterminée par une butée (fixe ou réglable) dont l'appui est garanti par la pression d'un élément bille-ressort.

Une plaque porte-outil Moduline spécifique peut remplacer la plaque originale. Le gain au niveau de la fiabilité et de la rapidité de changement des outils est alors très important.

Multidec®-Moduline is a modular tooling system with an optimum availability of options adapted to meet the different machines requirements on the market.

Grooves along the length of its base ensure excellent rigidity and precise positioning. Longitudinal positioning is fixed by a peg (fixed or adjustable) which is held in place under pressure by a sprung bearing.

A specific Moduline tool holder plate can replace the original one. This way, gains in reliability and tool changeover speed are very high.



Besonderheiten & Vorteile

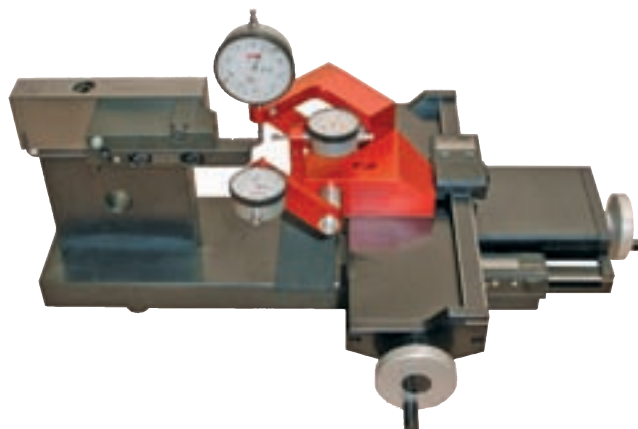
- höhere Anzahl Werkzeuge steigern die Produktivität signifikant
- einfacher und schneller Werkzeugwechsel, voreinstellbar auf feste oder einstellbare Länge
- stabiles und zuverlässiges Werkzeug-Spannsystem durch Längsverzahnung und grosser Halter-Querschnitt
- vielseitiges Werkzeugsystem, sehr einfacher Einsatz, Kombination mit Standard Werkzeugen und Kühlmittel-Zufuhr möglich
- grosse Auswahl von Haltern für ISO, TOP und CUT Wendepplatten
- kompatibel zu Applitec

Particularités et avantages

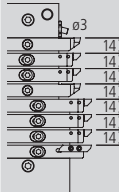
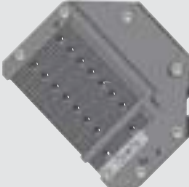
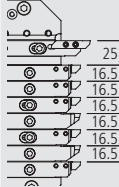
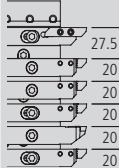
- plus d'outils, pour une augmentation de la productivité
- changement d'outil simple et rapide, possibilité de préréglage et de réglage de la longueur des outils
- système de fixation des porte-plaquettes fiable et rigide, avec rainures longitudinales et section d'outil importante
- système d'outils modulaire, utilisation simple, combinaison possible avec des outils standards ainsi que des modules d'arrosage
- grand choix d'outils pour plaquettes ISO, TOP et CUT
- compatible avec Applitec

Specialities & Advantage

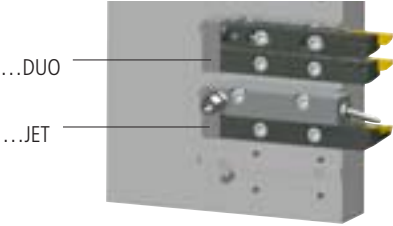
- more inserts increase productivity considerably
- easy and quick tool replacement, with presetting on fixed or adjustable length
- stable and reliable tool location system with longitudinal serrations and large square shanks
- versatile tooling system, easy to use, possible combination with standard tools and coolant supply devices
- wide range of holders for ISO, TOP and CUT inserts
- compatible to Applitec



...JET ...FIX

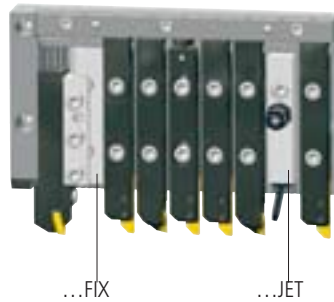
Maschinen-Typ Types de machines Type of machine	Werkzeugplatte (ohne Halter) Plaque porte-outils (sans porte-outil) Tool holder plate (without holder)	Bezeichnung Désignation Designation	Halter (max.) Porte-outil (max.) Holder (max.)	Zubehör Accessoires Accessoires	
C12 C16		UML12 CITIZEN C16 	UML12... (8)	UML12 FIX 12/14	UML12 JET 5/16
K12 K16 (type VII)		UML16 CITIZEN K16 	UML16... (8)	UML16 FIX 16/16,5	UML12 JET 7/16
L16 (type VII / VIII) L20 (type VII / VIII)		UML16 CITIZEN L20 	UML16... (7)	UML16 FIX 16/20	UML16 JET 7/16

MANURHIN



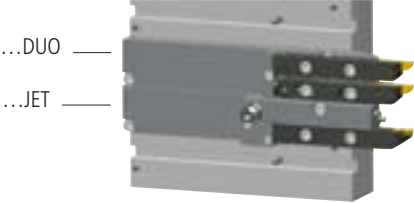
Maschinen-Typ Types de machines Type of machine	Grundhalter (ohne Halter) Bases porte-outils (sans porte-outil) Tool holder bases (without holder)	Bezeichnung Désignation Designation	Halter (max.) Porte-outil (max.) Holder (max.)	Kühlmittelzubehör Accessoires d'arrosage Coolant accessories
	Halter mit Kühlmittel-Zufuhr Porte-outil avec arrosage Holder with coolant supply	Doppel-Grundhalter Base porte-outil double Twin tool holder base	382...	393...
KMX 426 KMX 526 KMX 626 SWING 20-26		 	UML12... (1)	
		UML16 KMX26 JET	UML12... (2)	UML12 JET 5/16
		UML16 KMX26 DUO		

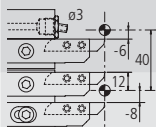
STAR



Maschinen-Typ Types de machines Type of machine	Werkzeugplatte (ohne Halter) Plaque porte-outils (sans porte-outil) Tool holder plate (without holder)	Bezeichnung Désignation Designation	Halter (max.) Porte-outil (max.) Holder (max.)	Zubehör Accessoires Accessoires	
			382...	Spannelement Module de serrage Clamping unit	393... Kühlmittelanschluss Raccord d'arrosage Coolant connection
SA-12 SA-16 SA-16R		UML16 STAR SA16 	UML16... (8)	UML16 FIX 16/16	UML16 JET 7/16
SB-16		UML16 STAR SB16 	UML16... (8)	UML16 FIX 16/17	UML16 JET 7/16
SR-10J		UML12 STAR SR10J 	UML12... (8)	UML12 FIX 12/14	UML12 JET 5/16
SR-16R SR-20R SR-20RII		UML16 STAR SR20R 	UML16... (9)	UML16 FIX 16/20	UML16 JET 7/16
SV12-20		UML16 STAR SV12-20 	UML16... (7)	UML16 FIX 16/20	UML16 JET 7/16

TORNOS

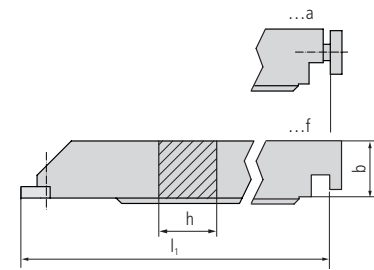
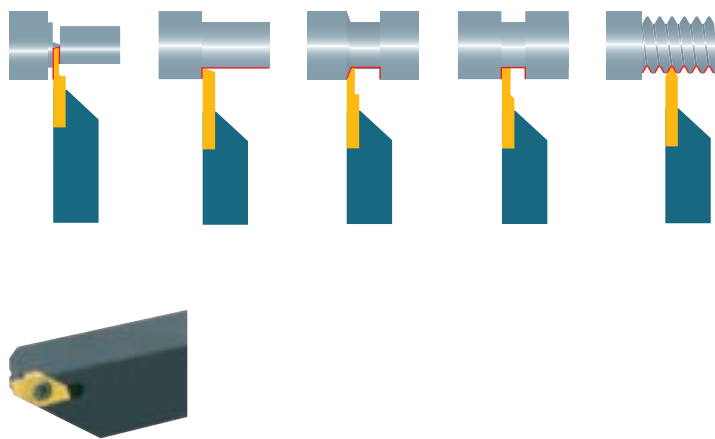


Maschinen-Typ Types de machines Type of machine	Grundhalter (ohne Halter) Bases porte-outils (sans porte-outil) Tool holder bases (without holder)		Bezeichnung Désignation Designation	Halter (max.) Porte-outil (max.) Holder (max.)	Kühlmittelzubehör Accessoires d'arrosage Coolant accessoires
	Halter mit Kühlmittel-Zufuhr Porte-outil avec arrosage Holder with coolant supply	Doppel-Grundhalter Base porte-outil double Twin tool holder base			
DECO SIGMA 20			UML16 S20 JET	UML16... (1)	
			 UML16 S20 DUO	UML16... (2)	UML16 JET 7/16
				382...	393...

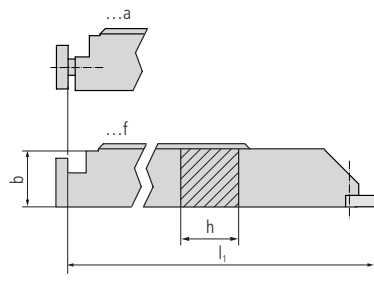
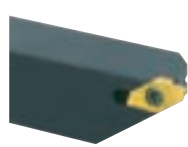
TORNOS



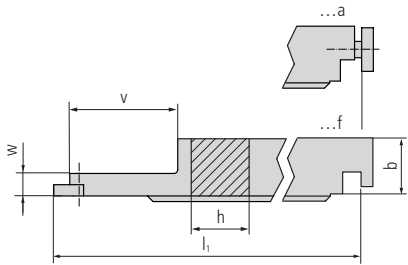
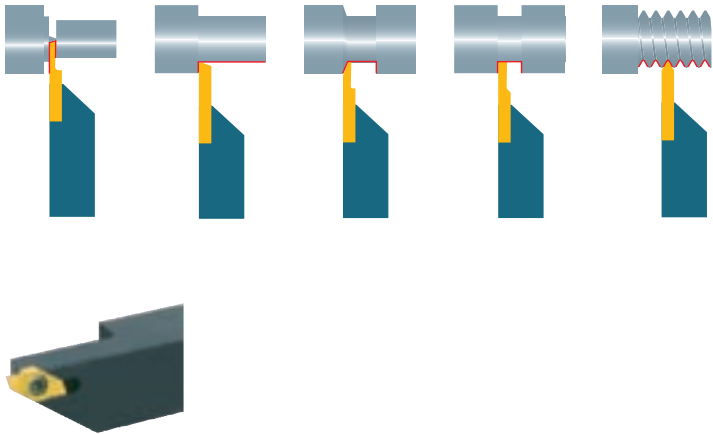
Maschinen-Typ Types de machines Type of machine	Werkzeugplatte (ohne Halter) Plaque porte-outils (sans porte-outil) Tool holder plate (without holder)	Bezeichnung Désignation Designation	Halter (max.) Porte-outil (max.) Holder (max.)	Zubehör Accessoires Accessoires	
			382...	Spannelement Module de serrage Clamping unit	393... Kühlmittelanschluss Raccord d'arrosage Coolant connection
MICRO 7		UML12 MICRO 7 	UML12... (6)		UML12 JET 5/16
MICRO 8		UML12 MICRO 8 	UML12... (7)		UML12 JET 7/16



Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁						
UML... 1600...												□ 34...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
		UML12a CUT 1600 R	■	15	12	110						16..
		UML12f CUT 1600 R	■	15	12	110						16..
		UML16a CUT 1600 R	■	16	16	118						16..
		UML16f CUT 1600 R	■	16	16	118						16..

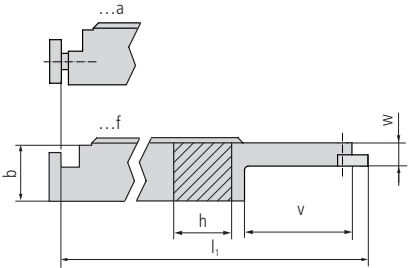


Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁						
UML... 1600... V												□ 34...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
		UML12a CUT 1600 LV	■	15	12	110						16..
		UML12f CUT 1600 LV	■	15	12	110						16..
		UML16a CUT 1600 LV	■	16	16	118						16..
		UML16f CUT 1600 LV	■	16	16	118						16..



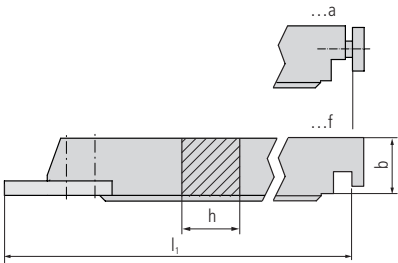
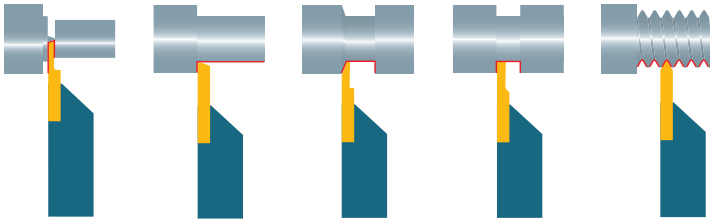
Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁	v	w				
UML... 1600... A												□ 34...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
			UML12a CUT 1600 RA	■	15	12	110	34	6			16..
			UML12f CUT 1600 RA	■	15	12	110	34	6			16..
			UML16a CUT 1600 RA	■	16	16	118	34	6			16..
			UML16f CUT 1600 RA	■	16	16	118	34	6			16..

Bearbeitungsmöglichkeiten | Variante d'usage | Machining methods □ 396

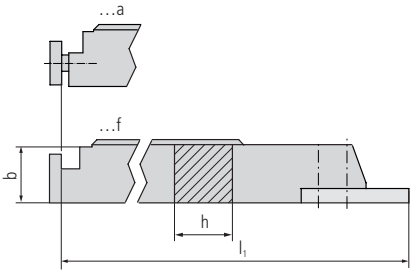


Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁	v	w				
UML... 1600... A V												□ 34...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
			UML12a CUT 1600 LA V	■	15	12	110	34	6			16..
			UML12f CUT 1600 LA V	■	15	12	110	34	6			16..
			UML16a CUT 1600 LA V	■	16	16	118	34	6			16..
			UML16f CUT 1600 LA V	■	16	16	118	34	6			16..

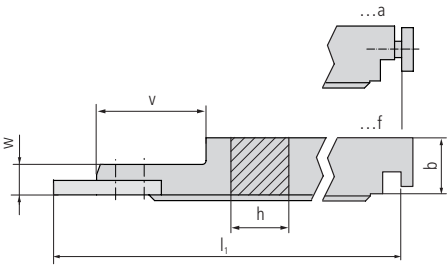
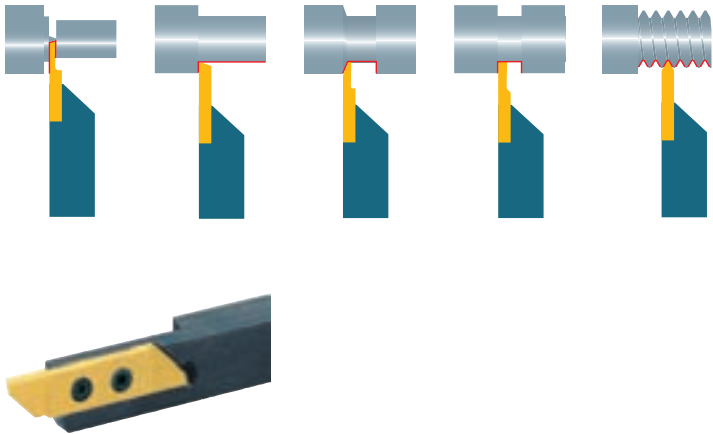
Bearbeitungsmöglichkeiten | Variante d'usage | Machining methods □ 396



Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁						
UML... 3000...												□ 34...
L	Linke Ausführung Exécution gauche Left execution			R	Rechte Ausführung Exécution droite Right execution							
			UML12a CUT 3000 R	■	15	12	110					30..
			UML12f CUT 3000 R	■	15	12	110					30..
			UML16a CUT 3000 R	■	16	16	118					30..
			UML16f CUT 3000 R	■	16	16	118					30..

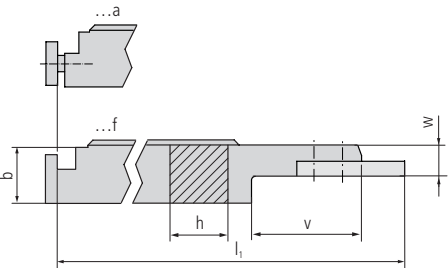


Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁						
UML... 3000... V												□ 34...
L	Linke Ausführung Exécution gauche Left execution			R	Rechte Ausführung Exécution droite Right execution							
			UML12a CUT 3000 LV	■	15	12	110					30..
			UML12f CUT 3000 LV	■	15	12	110					30..
			UML16a CUT 3000 LV	■	16	16	118					30..
			UML16f CUT 3000 LV	■	16	16	118					30..



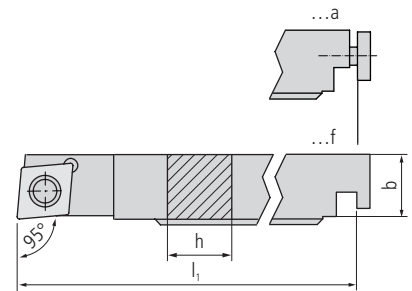
Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁	v	w				
UML... 3000... A												□ 34...
 Linke Ausführung Exécution gauche Left execution	 Rechte Ausführung Exécution droite Right execution											
		UML12a CUT 3000 RA	■	15	12	110	28	8				30..
		UML12f CUT 3000 RA	■	15	12	110	28	8				30..
		UML16a CUT 3000 RA	■	16	16	118	28	8				30..
		UML16f CUT 3000 RA	■	16	16	118	28	8				30..

Bearbeitungsmöglichkeiten | Variante d'usage | Machining methods □ 396

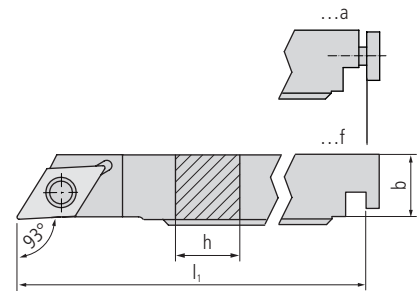
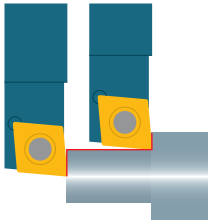


Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁	v	w				
UML... 3000... A V												□ 34...
 Linke Ausführung Exécution gauche Left execution	 Rechte Ausführung Exécution droite Right execution											
		UML12a CUT 3000 LA V	■	15	12	110	28	8				30..
		UML12f CUT 3000 LA V	■	15	12	110	28	8				30..
		UML16a CUT 3000 LA V	■	16	16	118	28	8				30..
		UML16f CUT 3000 LA V	■	16	16	118	28	8				30..

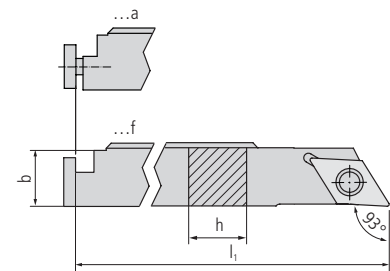
Bearbeitungsmöglichkeiten | Variante d'usage | Machining methods □ 396



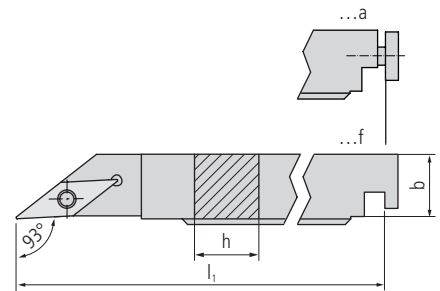
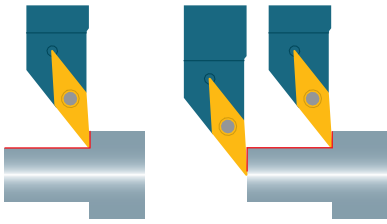
Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁						
UML... SCLC... (95°)												108...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
		UML12a SCLCR 09	■	15	12	110					CC..09T3..	
		UML12f SCLCR 09	■	15	12	110					CC..09T3..	
		UML16a SCLCR 09	■	16	16	118					CC..09T3..	
		UML16f SCLCR 09	■	16	16	118					CC..09T3..	



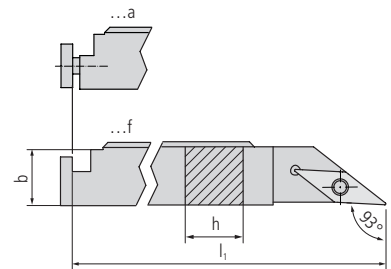
Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions										Schneiden Plaquettes Inserts
				b	h	l ₁								
UML... SDJC... (93°)														□ 112...
L	Linke Ausführung Exécution gauche Left execution			R	Rechte Ausführung Exécution droite Right execution									
				UML12a SDJCR 07	■	15	12	110						DC..0702..
				UML12f SDJCR 07	■	15	12	110						DC..0702..
				UML12a SDJCR 11	■	15	12	110						DC..11T3..
				UML12f SDJCR 11	■	15	12	110						DC..11T3..
				UML16a SDJCR 07	■	16	16	118						DC..0702..
				UML16f SDJCR 07	■	16	16	118						DC..0702..
				UML16a SDJCR 11	■	16	16	118						DC..11T3..
				UML16f SDJCR 11	■	16	16	118						DC..11T3..



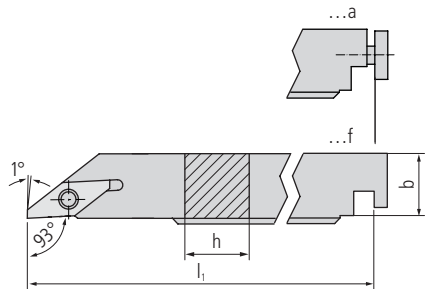
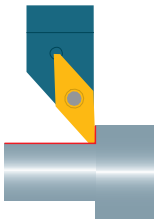
Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions										Schneiden Plaquettes Inserts
				b	h	l ₁								
UML... SDJC... V (93°)														□ 112...
L	Linke Ausführung Exécution gauche Left execution			R	Rechte Ausführung Exécution droite Right execution									
				UML12a SDJCL 11 V	■	15	12	110						DC..11T3..
				UML16a SDJCL 11 V	■	16	16	118						DC..11T3..



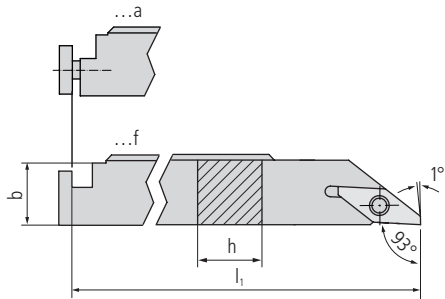
Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁						
UML... SVJC... (93°)												118...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
		UML12a SVJCR 11	■	15	12	110						VC..1103..
		UML12f SVJCR 11	■	15	12	110						VC..1103..
		UML16a SVJCR 11	■	16	16	118						VC..1103..
		UML16f SVJCR 11	■	16	16	118						VC..1103..



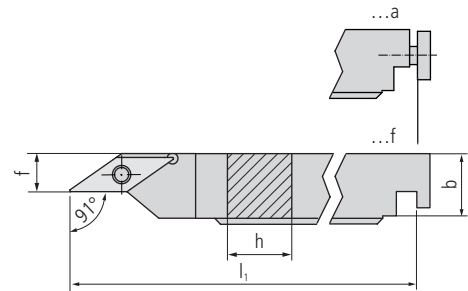
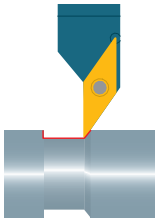
Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
UML... SVJC... V (93°)				b	h	l ₁						118...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
UML12a SVJCL 11 V	■			15	12	110						VC...1103..
UML16a SVJCL 11 V	■			16	16	118						VC...1103..



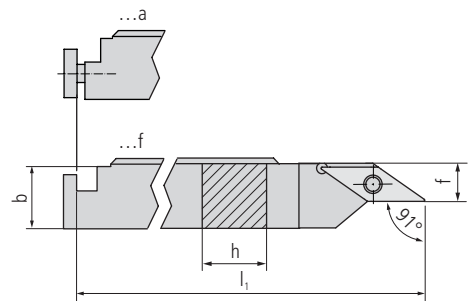
Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts	
UML... SVJP... (93°)				b	h	l ₁							□ 122...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution											
		UML12a SVJPR 10	■	15	12	110							VP..1003..
		UML12f SVJPR 10	■	15	12	110							VP..1003..
		UML16a SVJPR 10	■	16	16	118							VP..1003..
		UML16f SVJPR 10	■	16	16	118							VP..1003..



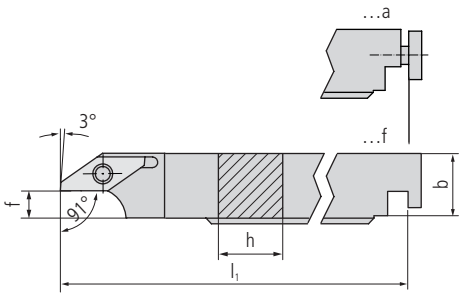
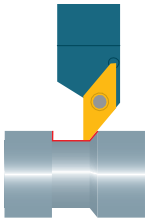
Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts	
UML... SVJP... V (93°)				b	h	l ₁							□ 122...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution											
UML12a SVJPL 10 V	■			15	12	110							VP..1003..
UML12f SVJPL 10 V	■			15	12	110							VP..1003..
UML16a SVJPL 10 V	■			16	16	118							VP..1003..
UML16f SVJPL 10 V	■			16	16	118							VP..1003..



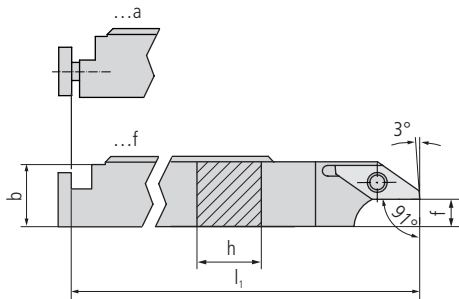
Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁			f			
UML... SVXC... (91°)												□ 118...
L Linke Ausführung Exécution gauche Left execution	R Rechte Ausführung Exécution droite Right execution											
			UML12a SVXCR 11	■	15	12	110			5.4		VC..1103..
			UML12f SVXCR 11	■	15	12	110			5.4		VC..1103..
			UML16a SVXCR 11	■	16	16	118			8.9		VC..1103..
			UML16f SVXCR 11	■	16	16	118			8.9		VC..1103..



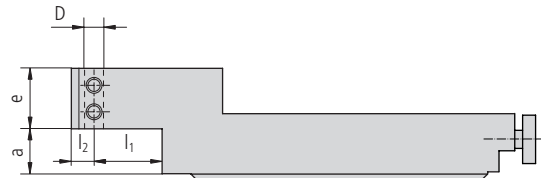
Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁			f			
UML... SVXC... V (91°)												□ 118...
L	Linke Ausführung Exécution gauche Left execution			R	Rechte Ausführung Exécution droite Right execution							
UML12a SVXCL 11 V	■			15	12	110			5.4		VC..1103..	
UML12f SVXCL 11 V	■			15	12	110			5.4		VC..1103..	
UML16a SVXCL 11 V	■			16	16	118			8.9		VC..1103..	
UML16f SVXCL 11 V	■			16	16	118			8.9		VC..1103..	



Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁				f		
UML... SVXP... (91°)												□ 122...
L	Linke Ausführung Exécution gauche Left execution			R	Rechte Ausführung Exécution droite Right execution							
				UML12a SVXPR 10	■	15	12	110		5		VC..1003..
				UML12f SVXPR 10	■	15	12	110		5		VC..1003..
				UML16a SVXPR 10	■	16	16	118		9		VC..1003..
				UML16f SVXPR 10	■	16	16	118		9		VC..1003..



Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				b	h	l ₁				f		
UML... SVXP... V (91°)												□ 122...
L	Linke Ausführung Exécution gauche Left execution			R	Rechte Ausführung Exécution droite Right execution							
				UML12a SVXPL 10 V	■	15	12	110		5		VC..1003..
				UML12f SVXPL 10 V	■	15	12	110		5		VC..1003..
				UML16a SVXPL 10 V	■	16	16	118		9		VC..1003..
				UML16f SVXPL 10 V	■	16	16	118		9		VC..1003..



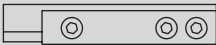
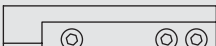
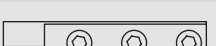
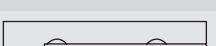
Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				a	e	l ₁	l ₂	D				
UML... 2440...												□ 164...
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
UML12a 2440 8 3	■			8	12	13	6	3				—
UML12a 2440 8 4	■			8	12	13	6	4				SD..4..
UML12a 2440 8 5	■			8	12	13	6	5				—
UML12a 2440 12 6	■			12	12	13	6	6				SD..6..
		UML16a 2440 12 3	■	12	16	18	6	3				—
		UML16a 2440 12 4	■	12	16	18	6	4				SD..4..
		UML16a 2440 12 5	■	12	16	18	6	5				—
		UML16a 2440 12 6	■	12	16	18	6	6				SD..6..
		UML16a 2440 12 8	■	18	16	18	6	8				SD..8..



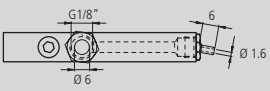
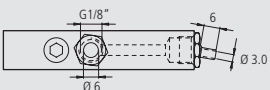
Bezeichnung Désignation Designation				Dimensionen Dimensions Dimensions								Schneiden Plaquettes Inserts
				a	b			D				
UML... 2402												
L Linke Ausführung Exécution gauche Left execution		R Rechte Ausführung Exécution droite Right execution										
UML12a 2402 44	■			4	8			4				*
		UML16a 2402 44	■	4	11			4				*

* Rändelräder | Molettes | Knurling wheels

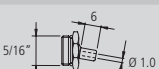
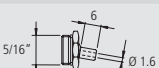
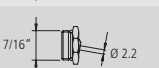
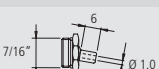
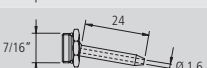
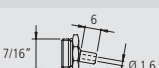
Spannelement | Module de serrage | Clamping unit

Abbildung Illustration Illustration	Bezeichnung Désignation Designation	Halter Porte-outil Holder
	UML12 FIX 12/14	12×12
	UML12 FIX 12/16	12×12
	UML16 FIX 16/16	16×16
	UML16 FIX 16/16.5	16×16
	UML16 FIX 16/17	16×16
	UML16 FIX 16/20	16×16

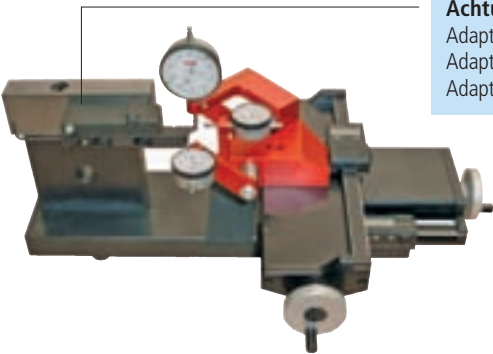
Kühlmittelanschluss | Modules d'arrosage | Coolant connection

Abbildung Illustration Illustration	Bezeichnung Désignation Designation	Kühlmittelrohr Optionen Raccords d'arrosage optionnels Coolant supply optionals
	UML12 JET 5/16	UML JET 5/16 Ø1.0×6 UML JET 5/16 Ø1.6×6
	UML16 JET 7/16	UML JET 7/16 Ø1.0×6 UML JET 7/16 Ø1.6×6 UML JET 7/16 Ø1.6×24 UML JET 7/16 Ø3.0×6

Kühlmittelrohr | Raccords d'arrosage | Coolant supply

Abbildung Illustration Illustration	Bezeichnung Désignation Designation	Anschluss Raccord Connection
	UML JET 5/16 Ø1.0×6	5/16"
	UML JET 5/16 Ø1.6×6	5/16"
	UML JET 5/16 Ø2.2×0	5/16"
	UML JET 7/16 Ø1.0×6	7/16"
	UML JET 7/16 Ø1.6×6	7/16"
	UML JET 7/16 Ø1.6×24	7/16"
	UML JET 7/16 Ø3.0×6	7/16"

UML PRESET 1



Achtung | Attention | Attention
Adapter und Einstell-Lehre müssen separat bestellt werden
Adaptateur et jauge d'étalonnage à commander séparément
Adaptor and master gauge must be ordered seperately

Adapter und Einstell-Lehre | Adaptateur et jauge d'étalonnage | Adaptor and master gauge

Maschinen-Typ Types de machines Type of machine	Adapter 1 Adaptateur 1 Adaptor 1	Adapter 2 Adaptateur 2 Adaptor 2	Einstell-Lehre Jauge d'étalonnage Master gauge
CITIZEN MANURHIN STAR UML12...	UML12 ADAPT		UML12 MASTER
CITIZEN STAR UML16...	UML16 ADAPT		UML16 MASTER
TORNOS DECO 10 MICRO 7 MICRO 8 UML12...	UML AD1 DECO10	UML12 AD2 DECO10	UML12 MASTER
TORNOS DECO 13 UML16...	UML AD1 DECO13	UML16 AD2 DECO13	UML16 MASTER
TORNOS DECO 20/26 UML16...	UML AD1 DECO20	UML16 AD2 DECO20	UML16 MASTER

UML... SC... (Klemmhalter | Porte-outils | Tool holders)

Abbildung Illustration Illustration	Bezeichnung Désignation Designation	Dimensionen Dimensions Dimensions	Beschreibung Description Description	Halter Porte-outil Holder
	MSP 35110 T15	M3.5 × 11 T15	Torxschraube Vis torx Torx scew	SC... 09
	MSP TX15	T15	Torxschlüssel Tournevis torx Torx screwdriver	SC... 09
	MSP TX15 D	T15 (3 Nm)	Drehmoment-Torxschlüssel Tournevis à serrage contrôlé Torquedriver	SC... 09

UML... SD... (Klemmhalter | Porte-outils | Tool holders)

Abbildung Illustration Illustration	Bezeichnung Désignation Designation	Dimensionen Dimensions Dimensions	Beschreibung Description Description	Halter Porte-outil Holder
	MSP 25060 T08	M2.5 × 6 T08	Torxschraube Vis torx Torx scew	SD... 07
	MSP 35110 T15	M3.5 × 11 T15		SD... 11
	MSP TX08	T08	Torxschlüssel Tournevis torx Torx screwdriver	SD... 07
	MSP TX15	T15		SD... 11
	MSP TX08 D	T08 (1.2 Nm)	Drehmoment-Torxschlüssel Tournevis à serrage contrôlé Torquedriver	SD... 07
	MSP TX15 D	T15 (3 Nm)		SD... 11

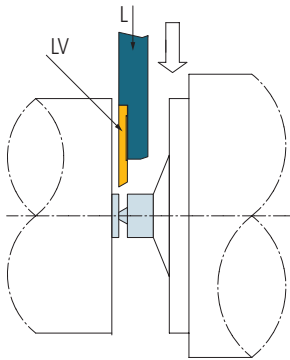
UML... SV... (Klemmhalter | Porte-outils | Tool holders)

Abbildung Illustration Illustration	Bezeichnung Désignation Designation	Dimensionen Dimensions Dimensions	Beschreibung Description Description	Halter Porte-outil Holder
	MSP 25060 T08	M2.5 × 6 T08	Torxschraube Vis torx Torx scew	SV... 11
	MSP TX08	T08	Torxschlüssel Tournevis torx Torx screwdriver	SV... 11
	MSP TX08 D	T08 (1.2 Nm)	Drehmoment-Torxschlüssel Tournevis à serrage contrôlé Torquedriver	SV... 11

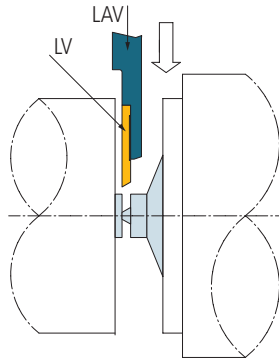
Durch eine andere Kombination von Halter und Wendeschneidplatte kann die Bearbeitung eines Werkstückes auch in schwierigen Bearbeitungssituationen fortgesetzt werden.

Il est possible de conserver la géométrie définie, tout en changeant de côté la plaquette, pour optimiser la coupe dans une situation difficile.

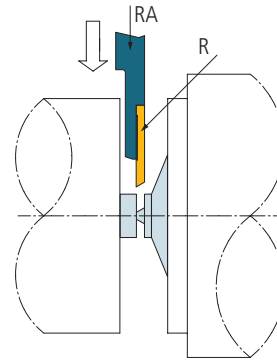
A different combination of holder and insert allows cutting even in difficult situations.



Abstechen mit Gegenspindel, kurze Bauteile
 Tronçonnage de courtes pièces avec contre broche
 Cut off with opposing spindle of short pieces



Abstechen mit Gegenspindel, kurze Bauteile
 Tronçonnage de courtes pièces avec contre broche
 Cut off with opposing spindle of short pieces



Abstechen mit Gegenspindel, lange Bauteile
 Tronçonnage de longues pièces avec contre broche
 Cut off with opposing spindle of long pieces

MULTIDEC®-HSK C32

Kurzbeschreibung
Gamme de produits
Product line



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Multidec®-HSK C32 ist ein Drehwerkzeug für hochpräzise Anwendungen, bestehend aus Wendeschneidplatten in der bekannten Utilis-Qualität und einem Halter mit der genormten HSK-Verbindung (DIN 69 893). Mit ihr wird die Steifigkeit bei der Bearbeitung deutlich erhöht. Das vermindert Vibrationen und führt zu einer überlegen präzisen Bearbeitung. Multidec®-HSK C32 ist auf allen Drehmaschinen mit fixem Spindelstock einsetzbar.

Für detailliertere Informationen bestellen Sie bitte den Utilis-Spezialprospekt Multidec®-HSK C32.

Multidec®-HSK C32 est un système d'attachement où les avantages résident essentiellement dans sa très grande rigidité et sa haute précision dans sa répétitivité. Son système cône/face au rapport 1:4 démontre ses aptitudes aux efforts de coupe transversaux. Ce programme d'outils est développé pour les centres de tournage où un haut rendement est demandé. Cet outillage est disponible en standard dans le programme Multidec® et correspond à la norme DIN 69 893.

Pour plus d'informations, n'hésitez pas à demander la documentation Multidec®-HSK C32.

The turning tool Multidec®-HSK C32 is ideal for high precision applications, consisting of the UTILIS known quality inserts and a standardized HSK connection (DIN 69 893). That's how the strength can be improved clearly. This causes a significant reduction of vibration and so cutting in superior style. Multidec®-HSK C32 is usable for all lathe machines with fixed headstock.

For detailed information please contact UTILIS and ask for the particular brochure of Multidec®-HSK C32.



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Kurzbeschreibung
Gamme de produits
Product line

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Schneiden
Jeux de couteaux
Inserts



404

Halter
Porte-outils
Holders



405

Ersatzteile
Pièces de rechange
Spare parts



406

Schnittdaten
Données de coupe
Cutting specification

	Schnittweg over high alloy over high alloy	Schnittweg over high alloy over high alloy	Schnittweg over high alloy over high alloy	Schnittweg over high alloy over high alloy	Schnittweg over high alloy over high alloy
Werkstoff Querschnitt Material (mm)	15-30	10-20	20-30	...	...
Kategorie Category	1	2	3	4	5
Werkstoff Material	...	...	...	...	...

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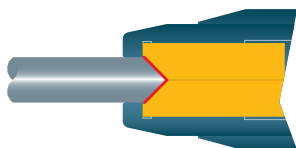


Multidec®-Endfix ist ein speziell für die Endenbearbeitung entwickeltes Werkzeug zum Anformen gerader und gebogener Stangen-, Draht- und Rohrenden. Die Form der im Grundkörper eingesetzten Messer kann frei (Kundenzeichnung erforderlich) oder nach dem bewährten Utilis-Standard gewählt werden. Die Messer aus unterschiedlichen Hartmetall- und HSS-Schneidstoffen werden dabei auf Wunsch bis ins Zentrum schneidend geschliffen und können nachgeschliffen werden.

Multidec®-Endfix a été développé spécialement pour le pointage des barres de décolletage ou similaires. Plusieurs types de formes de pointes, par exemple 60° ou 90°, sont disponibles en standard dans le programme. Sur demande d'autres formes peuvent être exécutées avec des outillages en HSS ou carbure. Le réaffûtage des couteaux est possible ce qui permet à l'outil d'être utilisé sur un long terme.

Multidec®-Endfix is made especially for end forming of straight and bent rods, wires and tubes. The design of the cutting form is produced according to UTILIS standard or to customer's specification (drawing by customer necessary). Upon request the different HSS or carbide inserts can be ground cutting to the centre.



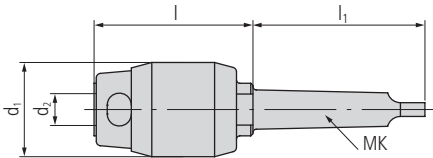
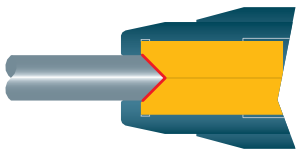


Bezeichnung Désignation Designation	Hartmetall Carbure Carbide	HSS Acier rapide HSS		Technische Zeichnung Design Drawing	Dimensionen Dimensions Dimensions					Halter Porte-outil Holder
		●	●		D max.	d	l	α	r	
MEM...	○	○	○							□ 405...
	UHM 20	...	HSS							
ME M 1 OF	■	■	□		10					D ≤ 10 ME H 1
ME M 2 OF	■	■	□		20					D ≤ 20 ME H 2
ME M 3 OF	■	■	□		30					D ≤ 30 ME H 3
ME M 1 A*	■	■	□		10					D ≤ 10 ME H 1
ME M 2 A*	■	■	□		20					D ≤ 20 ME H 2
ME M 3 A*	■	■	□		30					D ≤ 30 ME H 3
ME M 1 B*	□	■	□		10					D ≤ 10 ME H 1
ME M 2 B*	□	□	□		20					D ≤ 20 ME H 2
ME M 3 B*	□	□	□		30					D ≤ 30 ME H 3
ME M 1 C*	□	□	□		8					D ≤ 8 ME H 1
ME M 2 C*	□	□	□		16					D ≤ 16 ME H 2
ME M 3 C*	□	□	□		21					D ≤ 21 ME H 3
ME M 1 D	□	□	□		10	0-10		0-180°		D ≤ 10 ME H 1
ME M 2 D	□	□	□		20	0-20		0-180°		D ≤ 20 ME H 2
ME M 3 D	□	□	□		30	0-30		0-180°		D ≤ 30 ME H 3
ME M 1 E	□	□	□		10	0-10	max. 2/3 D			D ≤ 10 ME H 1
ME M 2 E	□	□	□		20	0-20	max. 2/3 D			D ≤ 20 ME H 2
ME M 3 E	□	□	□		30	0-30	max. 2/3 D			D ≤ 30 ME H 3
ME M 1 F	□	□	□		10				0.8 × D	D ≤ 10 ME H 1
ME M 2 F	□	□	□		20				0.8 × D	D ≤ 20 ME H 2
ME M 3 F	□	□	□		30				0.8 × D	D ≤ 30 ME H 3
ME M 1 G	□	□	□		10				r _{max} = 1/2 D	D ≤ 10 ME H 1
ME M 2 G	□	□	□		20				r _{max} = 1/2 D	D ≤ 20 ME H 2
ME M 3 G	□	□	□		30				r _{max} = 1/2 D	D ≤ 30 ME H 3
ME M 1 H	□	□	□		10		max. 9	0-180°		D ≤ 10 ME H 1
ME M 2 H	□	□	□		20		max. 16	0-180°		D ≤ 20 ME H 2
ME M 3 H	□	□	□		30		max. 20	0-180°		D ≤ 30 ME H 3
ME M 1 J	□	□	□		10		max. 9			D ≤ 10 ME H 1
ME M 2 J	□	□	□		20		max. 16			D ≤ 20 ME H 2
ME M 3 J	□	□	□		30		max. 20			D ≤ 30 ME H 3
ME M 1 K	□	□	□		10		max. 9	0-180°		D ≤ 10 ME H 1
ME M 2 K	□	□	□		20		max. 16	0-180°		D ≤ 20 ME H 2
ME M 3 K	□	□	□		30		max. 20	0-180°		D ≤ 30 ME H 3
ME M 1 L	□	□	□		10		max. 9			D ≤ 10 ME H 1
ME M 2 L	□	□	□		20		max. 16			D ≤ 20 ME H 2
ME M 3 L	□	□	□		30		max. 20			D ≤ 30 ME H 3
ME M 1 X	□	□	□	Sonderform nach Kundenzeichnung	10					D ≤ 10 ME H 1
ME M 2 X	□	□	□	Forme spéciale selon dessin	20					D ≤ 20 ME H 2
ME M 3 X	□	□	□	Special form according drawing	30					D ≤ 30 ME H 3

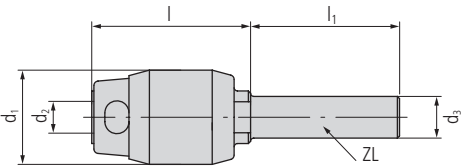
*Die Schneiden mit Standard-Form A/B/C sind für den gesamten Durchmesserbereich (0-D) verwendbar.

*Les jeux de couteaux avec forme standard A/B/C sont utilisables pour tout le diamètre de travail (0-D).

*The inserts form A/B/C are usable for the complete range (0-D).



Bezeichnung Désignation Designation		Dimensionen Dimensions Dimensions						Schneiden Plaquettes Inserts
		d ₁	d ₂	MK	l	l ₁		
Morsekonus Cone morse Mors taper								□ 404...
ME H 1 MK	■	25	1.5–10	1	52.3	65.5		D ≤ 10 ME M 1
ME H 2 MK	■	43	10–20	2	72.5	78.5		D ≤ 20 ME M 2
ME H 3 MK	■	62	20–30	3	92	98		D ≤ 30 ME M 3



Bezeichnung Désignation Designation		Dimensionen Dimensions Dimensions						Schneiden Plaquettes Inserts
		d ₁	d ₂	d ₃	l	l ₁		
Zylinderschaft Queue cylindrique Straight shank				^{h7}				□ 404...
ME H 1 ZL	■	25	1.5–10	10	52.3	30		D ≤ 10 ME M 1
ME H 2 ZL	■	43	10–20	16	72.5	69		D ≤ 20 ME M 2

Lieferumfang: Futter komplett ohne Schneiden und ohne Zentrierscheibe
Contenu de livraison: Porte-outil complet, mais sans jeu de couteaux et sans rondelle de centrage
Content of delivery: Holder complete without insert and without guide bushing

Abbildung Illustration Illustration	Bezeichnung Désignation Designation	Dimensionen Dimensions Dimensions	Beschreibung Description Description	Halter Porte-outil Holder
	ME SF 1 MK		Spannfutter Mandrin Chuck	ME H 1 MK
	ME SF 1 ZL			ME H 1 ZL
	ME SF 2 MK			ME H 2 MK
	ME SF 2 ZL			ME H 2 ZL
	ME SF 3 MK			ME H 3 MK
	ME MH 2 MK		Messerhalter Porte-outil Insert holder	ME H 2 MK
	ME MH 2 ZL			ME H 2 ZL
	ME MH 3 MK			ME H 3 MK
	ME DS 1 MK		Druckscheibe Rondelle de butée Thrust washer	ME H 1 MK
	ME DS 1 ZL			ME H 1 ZL
	ME DS 2 MK			ME H 2 MK
	ME DS 2 ZL			ME H 2 ZL
	ME VS 1 MK		Verdrehsicherung bombiert Vis de sécurité Crowned twisting locking device	ME H 1 MK
	ME VS 1 ZL			ME H 1 ZL
	ME VS 2 MK	M5 x 5	Verdrehsicherung bombiert Vis de sécurité Crowned twisting locking device	ME H 2 MK
	ME VS 2 ZL	M5 x 5		ME H 2 ZL
	ME VS 3 MK	M6 x 6		ME H 3 MK
	ME GS 2 MK	M5 x 5	Gewindestift Vis sans tête Adjusting screw	ME H 2 MK
	ME GS 2 ZL	M5 x 5		ME H 2 ZL
	ME GS 3 MK	M6 x 6		ME H 3 MK
	ME ES 2 MK	M5 x 8	Einstellschraube Vis d'ajustage Set screw	ME H 2 MK
	ME ES 2 ZL	M5 x 8		ME H 2 ZL
	ME ES 3 MK	M6 x 12		ME H 3 MK
	ME ZS 1 D015	Ø 1.5	Zentrierscheibe Rondelle de centrage Guide ring	ME H 1 ...
	ME ZS 1 D020	Ø 2		ME H 1 ...
	ME ZS 1 D025	Ø 2.5		ME H 1 ...
	ME ZS 1 D030	Ø 3		ME H 1 ...
	ME ZS 1 D035	Ø 3.5		ME H 1 ...
	ME ZS 1 D040	Ø 4		ME H 1 ...
	ME ZS 1 D045	Ø 4.5		ME H 1 ...
	ME ZS 1 D050	Ø 5		ME H 1 ...
	ME ZS 1 D055	Ø 5.5		ME H 1 ...
	ME ZS 1 D060	Ø 6		ME H 1 ...
	ME ZS 1 D065	Ø 6.5		ME H 1 ...
	ME ZS 1 D070	Ø 7		ME H 1 ...
	ME ZS 1 D075	Ø 7.5		ME H 1 ...
	ME ZS 1 D080	Ø 8		ME H 1 ...
	ME ZS 1 D085	Ø 8.5		ME H 1 ...
	ME ZS 1 D090	Ø 9		ME H 1 ...
	ME ZS 1 D095	Ø 9.5		ME H 1 ...
	ME ZS 1 D100	Ø 10		ME H 1 ...
	ME ZS 2 D100	Ø 10	Zentrierscheibe Rondelle de centrage Guide ring	ME H 2 ...
	ME ZS 2 D110	Ø 11		ME H 2 ...
	ME ZS 2 D120	Ø 12		ME H 2 ...
	ME ZS 2 D130	Ø 13		ME H 2 ...
	ME ZS 2 D140	Ø 14		ME H 2 ...
	ME ZS 2 D150	Ø 15		ME H 2 ...
	ME ZS 2 D160	Ø 16		ME H 2 ...
	ME ZS 2 D170	Ø 17		ME H 2 ...
	ME ZS 2 D180	Ø 18		ME H 2 ...
	ME ZS 2 D190	Ø 19		ME H 2 ...
	ME ZS 2 D200	Ø 20	Zentrierscheibe Rondelle de centrage Guide ring	ME H 2 ...
	ME ZS 3 D200	Ø 20		ME H 2 MK
	ME ZS 3 D210	Ø 21		ME H 2 MK
	ME ZS 3 D220	Ø 22		ME H 2 MK
	ME ZS 3 D230	Ø 23		ME H 2 MK
	ME ZS 3 D240	Ø 24		ME H 2 MK
	ME ZS 3 D250	Ø 25		ME H 2 MK
	ME ZS 3 D260	Ø 26		ME H 2 MK
	ME ZS 3 D270	Ø 27		ME H 2 MK
	ME ZS 3 D280	Ø 28		ME H 2 MK
	ME ZS 3 D290	Ø 29		ME H 2 MK
	ME ZS 3 D300	Ø 30		ME H 2 MK

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Werkstoffe | Matières | Materials

	Stahl unlegiert Acier non allié Steel unalloyed			Stahl niedriglegiert Acier faibl. allié Steel low alloyed			Stahl hochlegiert Acier fortem. allié Steel high alloyed			Titan Titane Titanium		
Härte (HB) Dureté (HB) Hardness value (HB)	125–300			180–250			200–350			–		
Kategorie Catégorie Category	I			II			III			IV		
Bearbeitung Usinage Machining method	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼

Vorschübe (f) | Avances (f) | Feeds (f)

	f (mm/U mm/tr mm/rev)			f (mm/U mm/tr mm/rev)			f (mm/U mm/tr mm/rev)			f (mm/U mm/tr mm/rev)		
ME M 1 ...	0.02–0.05			0.02–0.05			0.02–0.05			0.01–0.03		
ME M 2 ...	0.02–0.08			0.02–0.08			0.02–0.08			0.01–0.04		
ME M 3 ...	0.03–0.1			0.02–0.1			0.02–0.08			0.01–0.06		

Schnittgeschwindigkeiten (v_c) | Vitesses de coupe (v_c) | Cutting speeds (v_c)

	v _c (m/min)			v _c (m/min)			v _c (m/min)			v _c (m/min)		
Schneidstoff Hartmetall Matériaux de coupe carbure Cutting material carbide												
UHM 20	–	50–120	–	–	40–90	–	–	30–70	–	–	20–60	–
Schneidstoff HSS Matériaux de coupe acier rapide Cutting material high speed steel												
HSS	–	25–30	–	–	20–25	–	–	15–20	–	–	15–20	–
HSS SX	–	35–40	–	–	25–30	–	–	20–25	–	–	20–30	–

Werkstoffe | Matières | Materials

	Rostfreier Stahl Acier inoxydable Stainless steel			Rostfreier Stahl Acier inoxydable Stainless steel			Aluminium Aluminium Aluminium			Messing Laiton Brass		
Härte (HB) Dureté (HB) Hardness value (HB)	180–220			220–330			60–130			–		
Kategorie Catégorie Category	V			VI			VII			VIII		
Bearbeitung Usinage Machining method	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼	▼	▼▼	▼▼▼

Vorschübe (f) | Avances (f) | Feeds (f)

	f (mm/U mm/tr mm/rev)			f (mm/U mm/tr mm/rev)			f (mm/U mm/tr mm/rev)			f (mm/U mm/tr mm/rev)		
ME M 1 ...	0.01–0.04			0.01–0.04			0.02–0.1			0.03–0.1		
ME M 2 ...	0.01–0.05			0.01–0.05			0.05–0.1			0.03–0.1		
ME M 3 ...	0.02–0.1			0.02–0.1			0.05–0.2			0.05–0.2		

Schnittgeschwindigkeiten (v_c) | Vitesses de coupe (v_c) | Cutting speeds (v_c)

	v _c (m/min)			v _c (m/min)			v _c (m/min)			v _c (m/min)		
Schneidstoff Hartmetall Matériaux de coupe carbure Cutting material carbide	v _c (m/min)			v _c (m/min)			v _c (m/min)			v _c (m/min)		
UHM 20	–	25–70	–	–	15–40	–	–	50–120	–	–	50–120	–
Schneidstoff HSS Matériaux de coupe acier rapide Cutting material high speed steel	v _c (m/min)			v _c (m/min)			v _c (m/min)			v _c (m/min)		
HSS	–	10–18	–	–	5–10	–	–	30–60	–	–	40–80	–
HSS SX	–	15–20	–	–	7–10	–	–	40–80	–	–	50–90	–

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DELTA CONTROL

Delta Control ist ein modulares Messsystem zum Messen der axialen Einzugskraft von Werkzeugen in Werkzeugmaschinen. Es ermöglicht das Messen der Einzugskräfte direkt an der Werkzeugmaschine und mit dem vorhandenen Einzugsbolzen.

Für detailliertere Informationen bestellen Sie bitte den Utilis-Spezialprospekt Delta Control.

Un système de mesure et de contrôle modulaire, visant à mesurer les forces de traction axiales réelles d'une broche de fraiseuse ou d'un centre d'usinage. Cet appareil permet de contrôler à tous moments et en quelques minutes, l'état de votre broche, sans neutralisation de la machine.

Pour plus de renseignements, n'hésitez pas à demander la documentation Delta Control.

Delta Control is a modular measuring system for checking the axial clamping on machine tools. It makes possible to measure the clamping force. The system enables you to check the clamping force directly on the machine with your clamping bolts.

For detailed information please contact UTILIS and ask for the particular brochure of Delta Control.



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Konzept/Gestaltung

Utilis AG, Müllheim

Satz/Realisation

Utilis AG, Müllheim

Fotos

Utilis AG, Müllheim

Titelbild: Heinz Erismann, FOTOMAGIE.com

Druck

dfmedia, Flawil

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Composition/réalisation

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Photographies

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Images de titre: Heinz Erismann, FOTOMAGIE.com

Impression

dfmedia, Flawil

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Cover picture: Heinz Erismann, FOTOMAGIE.com

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dfmedia, Flawil

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