



# vol. 51A

[www.osgeurope.com](http://www.osgeurope.com)

WXL WXS WX FX E  
CARBIDE



TOOL COMMUNICATION

# OSG EUROPE



TOOL COMMUNICATION

OSG CORPORATION



	<b>Material - Material - Materiale - Matière</b>			
	Carbide	Vollhartmetall	Carburo	Carbure
	High grade Powder Metallurgy HSS (XPM) [Co10+V5]	Pulvermetall HSS (XPM) [Co10+V5]	Alto livello di metallurgia delle polveri sinterizzato HSS (XPM) [Co10+V5]	Haut niveau de métallurgie des poudres HSS (XPM) [Co10+V5]
	Powder Metallurgy HSS (PM+T15) [Co5+V5]	Pulvermetall HSS (PM+T15) [Co5+V5]	Metallurgia delle polveri sinterizzato HSS (PM-T15) [Co5+V5]	Métallurgie des poudres HSS (PM-T15) [Co10+V5]
	HSS Cobalt (Co8)	HSS Cobalt (Co8)	HSS Cobalto (Co8)	HSS Cobat (Co8)
	<b>Coating - Beschichtung - Rivestimento - Revêtement</b>			
	WXL coating	WXL beschichtung	WXL rivestimento	WXL revêtement
	WXS super coating	WXS super beschichtung	WXS super rivestimento	WXS revêtement super
	Multi layered composite TiAlN	Mehrlagen-beschichtung TiAlN	Rivestimento multistrato composito TiAlN	Revêtement multicouches composite TiAlN
	Multi layered composite TiAlN	Mehrlagen-beschichtung TiAlN	Rivestimento multistrato composito TiAlN	Revêtement multicouches composite TiAlN
	Multi layered coating TiAlN	Mehrlagen-beschichtung TiAlN	Rivestimento multistrato composito TiAlN	Revêtement multicouches TiAlN
	Coating Tin	TiN Beschichtung	Rivestimento TiN	Revêtement TiN
	Multi layered composite TiAlN for Hypro Shrink Fit	Mehrlagen TiAlN Beschichtung für Schrumpferwerkzeuge	GX (multistrato TiAlN) speciale per calettamento	Revêtement GX (multicouches TiAlN) spécial frettage
	Chromium nitride	Chromnitrit Beschichtung	Nitruro di cromo	Nitride de chrome
	Diamond	Diamond Beschichtung	Rivestimento diamante	Revêtement diamanté
	<b>Milling operation - Fräsmethode - Fresatura - Usinage</b>			
	High Speed Milling	HSC	Alta velocità	Usinage haute vitesse
	Ultra High Speed Milling	Utra HSC	Super alta velocità	Usinage ultra haute vitesse
	Roughing	Schruppen	Sgrossatura	Ebauche
	Roughing and Finishing	Schruppen und Schlichten	Sgrossatura e finitura	Ebauche et Finition
	Pocket Roughing	Taschenfräsen	Sgrossatura in cavità	Ebauche poches
	Slotting and Contouring	Nuten- und Konturfräsen	Sgrossatura e contornatura	Rainurage et contourne
	Mirror finishing	Super Schlichten	Super finitura	Finition miroir
	Deep wall milling	Taschenfräsen	Per fresature di pareti profondi	Fraisage cavité profonde
	Deep slotting	Rippenfräsen	Per scanalature profonde	Rainurage profond
	<b>Tolerance - Toleranz - Tolleranza - Tolérance</b>			
	Milling diameter tolerance	Durchmesser-toleranz	Tolleranza del diametro di fresatura	Tolérance dia. de fraisage
	<b>Radius Tolerance - Radius Tolerance - Tolleranza del taggio - Tolérance rayon</b>			
	Radius tolerance	Radius-genauigkeit	Tolleranza del raggio delle frese	Tolérance du rayon
	<b>Helix Angle - Helix-Drall Winkel - Angolo d'elica - Angle d'hélice</b>			
	Helix Angle	Helix-Drall Winkel	Angolo d'elica	Agle d'hélice

	<b>Series - Series - Series - Série</b>			
	Internal oil hole	Innere Kühlmittel-zuluhr	Confori di lubrificazione interni	Trous de huile pour arrosage interne
	Stub length	Kurzer Hals	Serie troncato	Série courte
	Long serie	Langer Hals	Serie lunga	Série longue
	Extra long serie	Extra Langer Hals	Serie extra lunga	Série extra longue
	Extra short cutlength	Schneidenlänge extra kurz	Lunghezza di taglio extra corta	Long. Coupe extra courte
	Short cutlength	Schneidenlänge kurz	Lunghezza di taglio corta	Long. Coupe courte
	Long cutlength	Schneidenlänge lang	Lunghezza di taglio lunga	Long. Coupe longue
	Extra long cutlength	Schneidenlänge extra lang	Lunghezza di taglio extra lunga	Long. Coupe extra longue
	Cutlength 1,5 D	Schneidenlänge 1,5 D	Lunghezza di taglio 1,5 D	Longueur de coupe 1,5 D
	Cutlength 0,8 D	Schneidenlänge 0,8 D	Lunghezza di taglio 0,8 D	Longueur de coupe 0,8 D
	Cutdepth 1,5 D	Schnittiefe 1,5 D	Profondità di taglio di taglio 1,5 D	Profond. Coupe 1,5 D
	<b>Center - Zentrum - Centro - Centre</b>			
	Center Cutting	Zentrum-schneidend	Taglio al centro	Coupe au centre
	<b>Corner edge - Schneidkantenausführung - Angolo di taglio - Arrête de coupe</b>			
	Sharp corner edge	Micro-Abzugfase	Angolo di taglio con micro-smusso	Angle vif
	220° cutting edge	220° Kukel	Tagliente a 220°	Sphérique sur 220°
	<b>Shank - Shaft - Gambo - Queue</b>			
	Long Pencil Neck	Langer konischer Schaft	Riduzione conica lunga	Dégagement conique long
	Pencil Neck	Konischer Schaft	Riduzione conica	Dégagement conique
	Short neck	Kurzer Schaft	Gambo corta	Queue courte
	Long neck	Überlaufhals	Collo lungo	Dégagement long
	Extra Long neck	Extra langer Überlaufhals	Collo extra lungo	Queue extra longue
	Slim shank	Schaftdurchmesser kleiner als Schneide	Diametro del gambo inferiore al dia. del taglio	Dia. Queue inf. dia coupe
	Developed for Shrink Fit System	Speziell entwickelt zum Schrumpfen	Sviluppate specialmente per il calettamento	Développé pour le frettage
	<b>Taper Angle - Kegeltoleranz - Tolleranza della conicità - Tolérance conicité</b>			
	Taper Angle per side	Kegeltoleranz	Tolleranza della conicità	Tolérance de conicité
	<b>Cutting conditions - Schnittwerte - Condizioni di taglio - Conditions de coupe</b>			
	Cutting conditions	Schnittwerte	Velocità di taglio	Conditions de coupe
	<b>Strongly recommended - OSG Empfehlung - Raccomandata OSG - Fortement recommandé</b>			
	Strongly recommended	OSG Empfehlung	Suggerito vivamente	Fortement recommandé

## DEAR CUSTOMER,

We are pleased to present our new High Performance Carbide Series Milling Cutters catalogue. We have gone to great lengths to make this catalogue as comprehensive and user friendly as possible.

This new catalogue features an illustrated index and product selection guide, designed to help you find the right tool for your application.

OSG's goal is to manufacture extraordinary cutting tools specially designed to meet your needs. We are dedicated to the following:

- Unsurpassed design and manufacturing quality
- World class R&D, engineering and test
- Total sales support including factory and field engineering staff dedicated to customer needs

We appreciate your continued support and we remain fully committed to serving your needs with innovative and superior products.

## LIEBE KUNDEN,

wir freuen uns, Ihnen unseren aktuellsten Katalog mit High Performance Fräsern präsentieren zu dürfen. Wir haben versucht den Katalog so übersichtlich und benutzerfreundlich wie möglich zu gestalten.

Dieser Katalog beinhaltet einen kompletten Überblick über unser Gewindeschneiderprogramm. Reich bebildert und detailliert Beschrieben um Ihnen der Suche nach dem richtigen Werkzeug für Ihre Anforderungen zu helfen.

Das Ziel des OSG ist es, Ihre Anforderungen richtig zu erkennen und Ihnen das optimale Werkzeug zur Verfügung zu stellen. Unsere Stärken sind:

- ein einmaliges Design und eine konstante Herstellungsqualität
- eine weltweite Forschungs- und Entwicklungsabteilung
- eine komplette Verkaufsabwicklung, in welche die Produktion und das Ingenieurwissen einfließt, abgestimmt auf die Kundenbedürfnisse

Wir wünschen Ihnen viel Spaß mit unserem Katalog.



## CARI CLIENTI,

siamo felici di presentarvi il Nostro nuovo catalogo Frese ad alta performance OSG.

Le geometrie, i materiali e la vasta gamma degli utensili da taglio, sono la Nostra carta vincente.

Un'équipe commerciale e tecnica ed un competente servizio clienti sono a Vostra disposizione per offrir Vi la migliore soluzione per aumentare le prestazioni delle Vostre lavorazioni.

I Nostri clienti possono contare su un importante magazzino utensili presso la sede delle OSG.

La OSG augura un ottimo lavoro con gli utensili di alta qualità.

## CHERS PARTENAIRES, CHERS CLIENTS,

Nous sommes heureux de vous présenter notre nouveau catalogue des fraises haute performance en carbure monolite, XPM et V3.

Nous avons mis tout en œuvre afin que ce catalogue soit le plus facile d'utilisation et le plus compréhensible possible.

Ce nouveau catalogue se distingue par son guide de sélection et son index rapide, pour des produits existants et nouveaux, qui vous donneront directement leurs champs d'application.

Le but d'OSG est de fabriquer des outils de coupe hors du commun conçus spécialement pour répondre à vos besoins. Nos atouts sont:

- un design unique et une qualité constante de fabrication.
- un département R & D au niveau mondial.
- un support total de vente comprenant les usines et les ingénieurs qui se consacrent au service de la clientèle.

Nous sommes heureux de vous compter parmi nos clients et nous restons à votre entière disposition pour vous proposer nos produits innovants et de haute qualité.



# SECTION - ÜBERSICHT - SEZIONE - SECTION

## MILLING - FRÄSEN - FRESATURA - FRAISAGE

Type	 DESCRIPTIONS	 BESCHREIBUNG	 DESCRIZIONE	 DESCRIPTIONS
<b>NEW</b> <b>WXL</b>	<ul style="list-style-type: none"> <li>New coating WXL end mill series for milling copper up to materials 50 HRC</li> </ul>	<ul style="list-style-type: none"> <li>Neue WXL - Beschichtung für Bearbeitungen von Kupfer Bis zu Werkstoffen mit 50 HRC</li> </ul>	<ul style="list-style-type: none"> <li>Frese Serie WXL con nuovo rivestimento per la fresatura del rame fino a 50 HRC</li> </ul>	<ul style="list-style-type: none"> <li>Nouvelle série de fraises avec revêtement WXL pour l'usinage du cuivre jusque des matières de 50HRC</li> </ul>
<b>NEW</b> <b>UP PHS</b>	<ul style="list-style-type: none"> <li>Vibration-resistant, multipurpose end mill</li> </ul>	<ul style="list-style-type: none"> <li>Allgemeine Anwendungen, Anti-Vibration</li> </ul>	<ul style="list-style-type: none"> <li>Fresa multifunzione, resistente alle vibrazioni</li> </ul>	<ul style="list-style-type: none"> <li>Fraise multi-fonction, anti-vibratoire.</li> </ul>
<b>WXS</b>	<ul style="list-style-type: none"> <li>End mills with long neck for milling work material up to 60 HRC</li> </ul>	<ul style="list-style-type: none"> <li>HSC-Werkzeuge mit Überlaufhals für Werkstoff bis 60 HRC</li> </ul>	<ul style="list-style-type: none"> <li>Frese con collo lungo per fresatura di materiali fino a 60 HRC</li> </ul>	<ul style="list-style-type: none"> <li>Fraises à dégagement long pour usinage matière jusqu'à 60 HRC</li> </ul>
<b>WX</b>	<ul style="list-style-type: none"> <li>New series of end mills, the best ratio performance - price</li> <li>New micrograin with improved TiAIN</li> </ul>	<ul style="list-style-type: none"> <li>Neueste Serie, bestes Preis-Leistungs-Verhältnis</li> <li>Neues Mischkorn, Hartmetall mit 189,776 verbesserter TiAIN Mehrlagenbeschichtung</li> </ul>	<ul style="list-style-type: none"> <li>Nuova serie di frese , il miglior rapporto tra qualità e prezzo</li> <li>Nuova micrograna con un migliorato rivestimento TiAIN</li> </ul>	<ul style="list-style-type: none"> <li>Nouvelle série de fraises, le meilleur rapport performance - prix.</li> <li>Nouveau micrograin avec TiAIN amélioré</li> </ul>
<b>FX</b>	<ul style="list-style-type: none"> <li>High performance end mills selected for High Speed milling.</li> <li>Milling work material up to 55 HRC</li> </ul>	<ul style="list-style-type: none"> <li>HSC Werkzeuge für allgemeine Anwendungen.</li> <li>Für Werkstoff bis 55 HRC</li> </ul>	<ul style="list-style-type: none"> <li>Frese ad alto rendimento selezionate per la fresatura ad alta velocità</li> <li>Fresatura di materiali fino a 55 HRC</li> </ul>	<ul style="list-style-type: none"> <li>Fraises de haute performance sélectionnées pour de très hautes vitesses de coupe.</li> <li>Usinage matière jusqu'à 55 HCR</li> </ul>
<b>FXS</b>	<ul style="list-style-type: none"> <li>High performance end mills selected for High Speed milling.</li> <li>Milling work material up to 60 HRC</li> </ul>	<ul style="list-style-type: none"> <li>Absolute Premium HSC Werkzeuge mit einer sehr grossen Ausführungsvielfalt.</li> <li>Für Werkstoff bis 60 HRC</li> </ul>	<ul style="list-style-type: none"> <li>Frese ad alto rendimento selezionate per la fresatura ad alta velocità</li> <li>Fresatura di materiali fino a 60 HRC</li> </ul>	<ul style="list-style-type: none"> <li>Fraises de haute performance sélectionnées pour de très hautes vitesses de coupe.</li> <li>Usinage matière jusqu'à 60 HCR</li> </ul>
<b>CA</b>	<ul style="list-style-type: none"> <li>For aluminium milling</li> <li>Gives a excellent surface finish</li> </ul>	<ul style="list-style-type: none"> <li>Für Aluminium</li> <li>Für gute Oberflächen und optimalen Spänentransport</li> </ul>	<ul style="list-style-type: none"> <li>Per la fresatura dell'alluminio</li> <li>Offre un'ottima finitura della superf</li> </ul>	<ul style="list-style-type: none"> <li>Pour l'usinage de l'aluminium.</li> <li>Donnent un excellent état de surface</li> </ul>
<b>CRN</b>	<ul style="list-style-type: none"> <li>End mills specially developed by OSG for milling work material as aluminium and copper</li> </ul>	<ul style="list-style-type: none"> <li>Spezielle Werkzeuge für die Bearbeitung von Werkstoffe wie Aluminium und Kupfer</li> </ul>	<ul style="list-style-type: none"> <li>Frese sviluppate in modo particolare dalla OSG per la fresatura di materiali come alluminio e rame</li> </ul>	<ul style="list-style-type: none"> <li>Fraises développées par OSG pour l'usinage des matières tel que l'aluminium, et le cuivre</li> </ul>
<b>GF</b>	<ul style="list-style-type: none"> <li>End mills for graphite milling</li> </ul>	<ul style="list-style-type: none"> <li>HSC-Werkzeuge für Graphit Bearbeitung</li> </ul>	<ul style="list-style-type: none"> <li>Frese per la fresatura della grafite</li> </ul>	<ul style="list-style-type: none"> <li>Fraises pour l'usinage du graphite</li> </ul>
<b>GX</b>	<ul style="list-style-type: none"> <li>End mills with micrograin substrate, coated</li> <li>Specially developed for Hypro Shrink Fit System</li> </ul>	<ul style="list-style-type: none"> <li>Hartmetallfräser mit Feinkorn Substranz, beschichtet.</li> <li>Speziell entwickelt zum Schrumpfen mit Hypro Shrink Fit Systemen</li> </ul>	<ul style="list-style-type: none"> <li>Frese con un substrato di micrograna, rivestite</li> <li>Sviluppate in modo particolare per il sistema di Calettamento</li> </ul>	<ul style="list-style-type: none"> <li>Fraises avec un substrat micrograin revêtu.</li> <li>Outils développés spécialement pour le frettage.</li> </ul>

## End mill selection chart by application

Type	Geometry	Coat	z	DIA	page	Hardened Steels Gehärteter Stahl Acciai temprati Aciers trempé										SUS	GG	CU	AC	GRAPH	TI	HPS	Plast
						~ 40 hrc	~ 45 hrc	~ 55 hrc	~ 60 hrc	~ 65 hrc	~ 35 hrc	~ 350 hb											
For general use - Allgemeine Anwendungen - Per una vasta gamma di applicazioni - Multi fonction																							
WXL-EDS		<b>NEW</b>	WXL	2	0.1-12	1	●	●	●				●	●	●	○			○	○			
WXL-EMS		<b>NEW</b>	WXL	4	1-30	2	●	●	●				●	●	●	○			○	○			
WX-EDS			WX	2	0.2-12	21	●	●	○	○			●	●	●	○			○	○			
WX-EMS			WX	4	2-9	23	●	●	○	○			○	●	○	○			○	○			
FX-MG-EDSS			FX	2	3-16	31	●	●	○	○			○	●	○	○			○	○			
FX-MG-EDS			FX	2	0.2-30	32	●	●	○	○			○	●	○	○			○	○			
FX-MG-EDL			FX	2	1-30	34	●	●	○				○	●	○	○			○	○			
FX-MG-EXDL			FX	2	3-30	34	●	●	●	○			○	●	○	○			●	●			
FX-SS-EDS			FX	2	6-12	35	●	●	○	○			○	●	○	○			○	○			
FX-EDS-6			FX	2	0.2-2.5	35	●	●	●	○			○	●	○	○			○	○			
FX-MG-EMSS			FX	4	3-16	38	●	●	○	○			○	●	○	○			○	○			
FX-MG-EMS			FX	4	2-30	38	●	●	○	○			○	●	○	○			○	○			
FX-MG-EML			FX	4	3-30	39	●	●	○				○	●	○	○			○	○			

## End mill selection chart by application

Type	Geometry	Coat	Z	DIA	page	Hardened Steels Gehärteter Stahl Acciai temprati Aciers trempé					SUS	GG	CU	AC	GRAPH	TI	HPS	Plast
						~ 40 hrc	~ 45 hrc	~ 55 hrc	~ 60 hrc	~ 65 hrc								
FX-MG-EXML		FX	4	3-30	39	●	●				○	●	○	○		○		
FX-SS-EMS		FX	4	6-12	40	●	●	○	○		○	●	○	○		○	○	
For mass production - Massenproduktion - Per grande produzione - Pour grande production																		
UP-PHS		NEW WXL	4	3-12	9	●	●	○			●	●	○	○		●	○	
WX-G-EDSS		WX	2	1-12	21	●	●	○	○		○	●	○	○		○	○	
WX-G-ETSS		WX	3	3-16	22	●	●	○			●				●			
WX-G-EMSS		WX	4	3-12	22	●	●	○	○		○	●	○	○		○	○	
WX-PHS		WX	4	3-20	23	●	●	○	○		●	●	○	○		●	●	
For hardened steel - Fur Gehärteter Stahl - Per Acciai temprati - Pour acier trempé																		
WXS-EMS		NEW WXS	4 - 6	1-12	10	●	●	●	●	○	○	●				○	○	
FXS-EMSS		FX	4 - 6	1-12	54	●	●	●	●	○	○	●				○	○	
FXS-EMS		FX	4 6 8	1-30	54	●	●	●	●	○	○	●				○	○	
FXS-LS-EMS		FX	4 6 8	3-30	55	●	●	●	●	○	○	●				○	○	
FXS-EML		FX	6 - 8	6-25	55	●	●	●	●		○	●				○	○	



## End mill selection chart by application

Type	Geometry	Coat	Z	DIA	page	Hardened Steels Gehärteter Stahl Acciai temprati Aciers trempé								SUS	GG	CU	AC	GRAPH	TI	HPS	Plast
						~ 40 hrc	~ 45 hrc	~ 55 hrc	~ 60 hrc	~ 65 hrc	~ 35 hrc	~ 350 hb									
FXS-HPE			4	10-22	55																
For exotic material (heat resistant) - Für Hitzebeständige Legierungen - Per acciaio resistente alle alte temperature - Pour alliage à haute résistance thermique																					
FX-MG-EHS			3 - 4	3-25	41	●	●	○	○		●	●	○	○			●	●			
FX-MG-EHL			3	6-12	41	●	●	○			●	●	○	○			●	●			
For roughing - Schruppen - Sgrossatura - Ebauche																					
FX-MG-REE			4	6-20	42	●	●				○	●	○				○	○			
HYP-HP-RESF			4 - 6	6-25	42	●	●				○	○									
For deep slotting - Rippenfräsen - Per fresatura di pareti profonde - Rainurage prfond																					
WX-LN-EDS			2	0.2-5	24	●	●	●	○		○	●	○	○			○	○			
FX-LN-EDS-6			2	0.5-2.5	36	●	●	●	○		○	●	○	○			○	○			
FX-RB-EGS			2	0.5-3	37	●	●	○	○		○	●	○	○			○				
FX-LN-EMS-6			4	1-6	40	●	●	●	○		○	●	○	○			○	○			
Ball nose ~ 50 HRC - Kopierfräser ~ 50 HRC - Frese sferiche ~ 50 HRC - Fraise hémisphérique ~ 50 HRC																					
WXL-EBD			2	R 0.05- 10	3	●	●	●			●	●	●	○			○	○			

## End mill selection chart by application

Type	Geometry	Coat	Z	DIA	page	Hardened Steels Gehärteter Stahl Acciai temprati Aciers trempé					SUS	GG	CU	AC	GRAPH	TI	HPS	Plast
						~ 40 hrc	~ 45 hrc	~ 55 hrc	~ 60 hrc	~ 65 hrc								
WXL-LN-EBD		NEW	WXL	2	R 0.05-3	4	●	●	●			●	●	●	○	○	○	○
WX-EBD		WX	2	R 0.2-6	26	●	●	●	○			●	●	○	○	○	○	○
WX-LN-EBD		WX	2	R 0.1-3	27	●	●	○	○			●	●	○	○	○	○	○
FX-MG-EBD-3		FX	2	R 0.2-1.5	43	●	●	●	○			●	●	○	○	○	○	○
FX-HS-EBDS		FX	2	R 1.5-6	43	●	●	●	○			●	●	○	○	○	○	○
FX-MG-EBD		FX	2	R 0.5-15	44	●	●	●	○			●	●	○	○	○	○	○
FX-HO-MG-EBD		FX	2	R 3-10	44	●	●	●	○			●	●	○	○	○	○	○
FX-LS-MG-EBD		FX	2	R 0.5-15	45	●	●	●	○			●	●	○	○	○	○	○
FX-SS-EBD		FX	2	R 3-6	45	●	●	●	○			●	●	○	○	○	○	○
FX-EBD-6		FX	2	R 0.1-3	46	●	●	●	○			●	●	○	○	○	○	○
FX-LN-EBD-6		FX	2	R 0.25-3	47	●	●	●	○			●	●	○	○	○	○	○
FX-RB-EBD		FX	2	R 0.3-2	47	●	●	●	○			●	●	○	○	○	○	○
FX-PC-MG-EBD		FX	2	R 0.5-6	48	●	●	●	○			●	●	○	○	○	○	○
FX-PCL-EBD		FX	2	R 2-6	48	●	●	●	○			●	●	○	○	○	○	○



## End mill selection chart by application

Type	Geometry	Coat	z	DIA	page	Hardened Steels Gehärteter Stahl Acciai temprati Aciers trempé					SUS	GG	CU	AC	GRAPH	TI	HPS	Plast
						~ 40 hrc	~ 45 hrc	~ 55 hrc	~ 60 hrc	~ 65 hrc								
GX-EBD-SF			2	10-20	76	●	●				●	●	○	○				
GX-EQD-SF			2	16-20	76	●	●				●	●	○	○				
Ball nose hardened steel > 50 HRC - Kopierfräser > 50 HRC - Frese sferiche > 50 HRC - Fraise hémisphérique > 50 HRC																		
WXS-HS-EBD			2	R 0.5-6	11	●	●	●	●	○	●	●				○	○	
WXS-EBD			2	R 0.5-6	11	●	●	●	●	○	●	●				○	○	
WXS-LN-EBD			2	R 0.05-3	12	○	○	●	●	○	○	○	○	○	○	○	○	
FXS-EBDS			2	R 0.5-12.5	56	●	●	●	●	○	●	●				○	○	
FXS-HO-EBDS			2	R 3-10	56	●	●	●	●	○	●	●				○	○	
FXS-EQD			2	R 0.5-5	57	●	●	●	○		●	●				○	○	
FXS-EBT			3	R 3-10	57	●	●	●	●	○								
FXS-HS-EBM			4	R 3-10	58	●	●	●	●									
FXS-EBM			4	R 3-10	58	●	●	●	●	●								
Ball nose mirror finish ~ 68 HRC - Kopierfräser für Superfinishing ~ 68 HRC - Frese sferiche er super finitura ~ 68 HRC - Fraise hémisphérique finition miroir ~ 68 HRC																		
CBN-SXB			2	R 0.2-1.5	66	○	●	●	●	●								

## End mill selection chart by application

Type	Geometry	Coat	Z	DIA	page	Hardened Steels Gehärteter Stahl Acciai temprati Aciers trempé					SUS	GG	CU	AC	GRAPH	TI	HPS	Plast
						~ 40 hrc	~ 45 hrc	~ 55 hrc	~ 60 hrc	~ 65 hrc								



Corner radius		- Mehrschneider mit Eckenradius			- Frese toriche			- Fraise à rayon									
WXS-CPR		<b>NEW</b>	WXS	2	R 0.05-1	16	●	●	●	●	●						
WX-HS-CRE			WX	3 - 4	6-12	29	●	●	●	●	○	●					
WX-CRE			WX	4	2-13	29	●	●	●	●	○	●					
WX-CR-PHS			WX	4	3-20	30	●	●	○	○		●	●	○	○	●	●
FX-CR-EDS-6			FX	2	0.6-2.5	49	●	●	●	○		○	●	○	○	○	○
FX-CR-MG-EDS			FX	2	3-12	49	●	●	○	○		○	●	○	○	○	○
FX-CR-MG-EDL			FX	2	6-12	50	●	●	○			○	●	○	○	○	○
FX-CR-MG-EHS			FX	4	6-25	50	●	●	○	○		●	●	○	○	●	●
FX-CR-MG-EMS			FX	4	4-12	51	●	●	●	●	○	○	●			○	○
FX-CR-MG-EML			FX	4	6-20	51	●	●	○			○	●	○	○	○	○
FXS-HS-PKE			FX	4	6-20	59	●	●	●	○		●	●			●	●
FXS-PKE			FX	4	3-20	59	●	●	●	○		●	●			●	●
FXS-MFE			FX	4	10-22	60	●	●	●	○		○	●			○	○

## End mill selection chart by application

Type	Geometry	Coat	Z	DIA	page	Hardened Steels Gehärteter Stahl Acciai temprati Aciers trempé								SUS	GG	CU	AC	GRAPH	TI	HPS	Plast
						~ 40 hrc	~ 45 hrc	~ 55 hrc	~ 60 hrc	~ 65 hrc	~ 35 hrc	~ 350 hb									
FXS-CR-EMS		FX	6-8	6-25	60	●	●	●	●	○	○	●						○	○		
GX-CR-EDS-SF		GX	2	10-20	77	●	●					●	●	○	○						
<b>Taper endmills - Konusfräser - Frese coniche - Fraise conique</b>																					
FX-MG-TPDS		FX	2	1-10	52	●	●	●	○		○	●	○	○				○	○		
FX-MG-TPMS		FX	4	3-10	53	●	●	●	○		○	●	○	○				○	○		
FXS-RB-TPE		FX	2	0.5-3	61	●	●	○	○		○	●	○					○			
<b>Taper ball endmills - Miniatur Konusfräser - Microfese coniche per nervature - Microfraise conique</b>																					
FXS-RB-TPB		FX	2	R 0.3- 1.25	63	●	●	○	○		○	●	○					○			
<b>Taper corner radius endmills - Miniatur Konusfräser mit Radius - Microfese sferiche-coniche per nervature - Fraise hémisphérique conique</b>																					
FXS-RB-TPCR		FX	2	1-1.5	65	●	●	○	○		○	●	○					○			
<b>For aluminium - Für Aluminium - Per aluminium - Pour aluminium</b>																					
CA-RG-EDS			2	1-20	67													●	●		
CA-RG-EDL			2	3-12	67													●	●		
CA-ETS			3	3-20	68													●	●		

## End mill selection chart by application

Type	Geometry	Coat	Z	DIA	page	Hardened Steels Gehärteter Stahl Acciai temprati Aciers trempé					SUS	GG	CU	AC	GRAPH	TI	HPS	Plast
						~ 40 hrc	~ 45 hrc	~ 55 hrc	~ 60 hrc	~ 65 hrc								
CAP-EBD			2	R 0.5-10	69								●	●				
CA-PKE			3	3-20	70								●	●				
CA-MFE			3	10-22	70								●	●				
For copper - Für Kupferlegierungen - Per rame - Pour cuivre																		
CRN-LN-EDS			2	0.5-12	71								●	○				
CRN-EMS			4	3-12	72								●	○				
CRN-EBD			2	R 3-6	73								●	○				
CRN-LN-EBD			2	R 0.5-2.5	73								●	○				
GF-EDR			2	2-12	74										●			
GF-EBDR			2	R 1-6	75										●			
DIA-EBD-SF			2	10-12	78										●			



## Selection - Auswahl - Selezione - Sélection

Type	4321 1	Coat.	Hardened Steels					SUS	GG	Cu	Al	Graphite	Ti	HRS	Plast.
			~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	~35 HRC	~350 HB						
CA-ETS	68									●	●				
CA-MFE	70									●	●				○
CA-PKE	70									●	●				○
CA-RG-EDL	67									●	●				○
CA-RG-EDS	67									●	●				○
CAP-EBD	69									●	●				●
CBN-SXB	NEW 66	CrN	○	●	●	●	●								
CRN-EBD	73	CrN								●	○				●
CRN-EMS	72	CrN								●	○				
CRN-LN-EBD	73	CrN								●	○				●
CRN-LN-EDS	71	CrN								●	○				●
DIA-EBD-SF	78	DIA								○	●	●			
FX-CR-EDS-6	49	FX	●	●	●	○		○	●	○	○		○	○	
FX-CR-MG-EDL	50	FX	●	●	○			○	●	○	○		○	○	
FX-CR-MG-EDS	49	FX	●	●	○	○		○	●	○	○		○	○	
FX-CR-MG-EHS	50	FX	●	●	○	○		●	●	○	○		●	●	
FX-CR-MG-EML	51	FX	●	●	○			○	●	○	○		○	○	
FX-CR-MG-EMS	51	FX	●	●	●	●	○	○	●				○	○	
FX-EBD-6	46	FX	●	●	●	○		●	●	○	○		○	○	
FX-EDS-6	35	FX	●	●	●	○		○	●	○	○		○	○	
FX-HO-MG-EBD	44	FX	●	●	●	○		●	●	○	○		○	○	
FX-HS-EBDS	43	FX	●	●	●	●	○	●	●	○	○		○	○	
FX-LN-EBD-6	47	FX	●	●	●	○		●	●	○	○		○	○	
FX-LN-EDS-6	36	FX	●	●	●	○		○	●	○	○		○	○	
FX-LN-EMS-6	40	FX	●	●	●	○		○	●	○	○		○	○	
FX-LS-MG-EBD	45	FX	●	●	●	○		●	●	○	○		○	○	
FX-MG-EBD	44	FX	●	●	●	○		●	●	○	○		○	○	
FX-MG-EBD-3	43	FX	●	●	●	○		●	●	○	○		○	○	
FX-MG-EDL	34	FX	●	●	○			○	●	○	○		○	○	
FX-MG-EDS	32	FX	●	●	○	○		○	●	○	○		○	○	
FX-MG-EDSS	31	FX	●	●	○	○		○	●	○	○		○	○	
FX-MG-EHL	41	FX	●	●	○			●	●	○	○		●	●	

## Selection - Auswahl - Selezione - Sélection

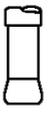
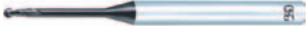
Type	Coat.	Hardened Steels					SUS	GG	Cu	Al	Graphite	Ti	HRS	Plast.
		~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	~35 HRC	~350 HB						
FX-MG-EHS	41	FX	●	●	○	○		●	●	○	○	●	●	
FX-MG-EML	39	FX	●	●	○			○	●	○	○	○	○	
FX-MG-EMS	38	FX	●	●	○	○		○	●	○	○	○	○	
FX-MG-EMSS	38	FX	●	●	○	○		○	●	○	○	○	○	
FX-MG-EXDL	34	FX	●	●	●	○		○	●	○	○	●	●	
FX-MG-EXML	39	FX	●	●				○	●	○	○	○		
FX-MG-REE	42	FX	●	●				○	●	○		○	○	
FX-MG-TPDS	52	FX	●	●	●	○		○	●	○	○	○	○	
FX-MG-TPMS	53	FX	●	●	●	○		○	●	○	○	○	○	
FX-PCL-EBD	48	FX	●	●	●	○		●	●	○	○	○		
FX-PC-MG-EBD	48	FX	●	●	●	○		●	●	○	○	○	○	
FX-RB-EBD	47	FX	●	●	●	○		●	●	○	○	○		
FX-RB-EGS	37	FX	●	●	○	○		○	●	○	○	○		
FX-SS-EBD	45	FX	●	●	●	○		●	●	○	○	○	○	
FX-SS-EDS	35	FX	●	●	○	○		○	●	○	○	○	○	
FX-SS-EMS	40	FX	●	●	○	○		○	●	○	○	○	○	
FXS-CR-EMS	60	FX	●	●	●	●	○	○	●			○	○	
FXS-EBDS	56	FX	●	●	●	●	○	●	●			○	○	
FXS-EBM	58	FX	●	●	●	●	●							
FXS-EBT	57	FX	●	●	●	●	○							
FXS-EML	55	FX	●	●	●	●		○	●			○	○	
FXS-EMS	54	FX	●	●	●	●	○	○	●			○	○	
FXS-EMSS	54	FX	●	●	●	●	○	○	●			○	○	
FXS-EQD	57	FX	●	●	●	○		●	●			○	○	
FXS-HO-EBDS	56	FX	●	●	●	●	○	●	●			○	○	
FXS-HPE	55	FX	●	●	●	●		○	●			○	○	
FXS-HS-EBM	58	FX	●	●	●	●								
FXS-HS-PKE	59	FX	●	●	●	○		●	●			●	●	
FXS-LS-EMS	55	FX	●	●	●	●	○	○	●			○	○	
FXS-MFE	60	FX	●	●	●	○		○	●			○	○	
FXS-PKE	59	FX	●	●	●	○		●	●			●	●	
FXS-RB-TPB	63	FX	●	●	○	○		○	●	○		○		

## Selection - Auswahl - Selezione - Sélection

Type	4321 1	Coat.	Hardened Steels					SUS	GG	Cu	Al	Graphite	Ti	HRS	Plast.
			~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	~35 HRC	~350 HB						
FXS-RB-TPCR	65	FX	●	●	○	○		○	●	○			○		
FXS-RB-TPE	61	FX	●	●	○	○		○	●	○			○		
GF-EBDR	75											●			
GF-EDR	74											●			
GX-CR-EDS-SF	77	GX	●	●				●	●	○	○				
GX-EBD-SF	76	GX	●	●				●	●	○	○				
GX-EQD-SF	76	GX	●	●				●	●	○	○				
HYP-HP-RESF	42														
UP-PHS <b>NEW</b>	9	WX	●	●	○			●	●	○	○		●	○	
WX-CRE	29	WX	●	●	●	●	○		●						
WX-CR-PHS	30	WX	●	●	○	○		●	●	○	○		●	●	
WX-EBD	26	WX	●	●	●	○		●	●	○	○		○	○	
WX-EDS	21	WX	●	●	○	○		●	●	●	○		○	○	
WX-EMS	23	WX	●	●	○	○		○	●	○	○		○	○	
WX-G-EDSS	21	WX	●	●	○	○		○	●	○	○		○	○	
WX-G-EMSS	22	WX	●	●	○	○		○	●	○	○		○	○	
WX-G-ETSS	22	WX	●	●	○			●				●			
WX-HS-CRE	29	WX	●	●	●	●	○		●						
WX-LN-EBD	27	WX	●	●	○	○		●	●	○	○		○	○	
WX-LN-EDS	24	WX	●	●	●	○		○	●	○	○		○	○	
WX-PHS	23	WX	●	●	○	○		●	●	○	○		●	●	
WXL-EBD <b>NEW</b>	3	WXL	●	●	●			●	●	●	○		○	○	
WXL-LN-EBD <b>NEW</b>	4	WXL	●	●	●			●	●	●	○		○	○	
WXL-EDS <b>NEW</b>	1	WXL	●	●	●			●	●	●	○		○	○	
WXL-EMS <b>NEW</b>	2	WXL	●	●	●			●	●	●	○		○	○	
WXS-CPR <b>NEW</b>	16	WXS	●	●	●	●		●							
WXS-EBD <b>NEW</b>	11	WXS	●	●	●	●	○	●	●				○	○	
WXS-EMS <b>NEW</b>	10	WXS	●	●	●	●	○	○	●				○	○	
WXS-HS-EBD <b>NEW</b>	11	WXS	●	●	●	●	○	●	●				○	○	
WXS-LN-EBD	12	WXS	○	○	●	●	○	○	○	○	○		○	○	

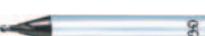
## MILLING - FRÄSEN - FRESATURA - FRAISAGE

## Index - Vorschau - Indice - Index

Appearance Gestalt	Type Typ	Coat. Beschichtung	Specification Ausführung	Range Durchmesser	
<b>SUPER RADIUS END MILLS - MEHRSCHEIDER MIT SUPER ECKENRADIUS</b>					
	 WX-HS-CRE		4 flutes, stub length 4 Schneiden, Schneidenlänge: kurz, mit Eckenradius	6~12	29
	 WX-CRE		3 or 4 flutes, long shank 3 oder 4 Schneiden, Schneidenlänge: lang, mit Eckenradius	2~13	29
<b>CORNER RADIUS END MILLS - MEHRSCHEIDER MIT ECKENRADIUS</b>					
<b>NEW</b>	 WXS-CPR		2 flutes, radius end mill 2 Schneiden mit Eckenradius	0.1~2	16
	 WX-CR-PHS		4 flutes, big cutdepth 4 Schneiden, maximale Schnittiefe	3~20	30
	 FX-CR-EDS-6		2 flutes, stub length, shank diameter 6 2 Schneiden, kurz, Schaft 6 mm	0.6~2.5	49
	 FX-CR-MG-EDS		2 flutes, long shank, short cutlength 2 Schneiden, langer Schaft, Schneidenlänge : kurz	3~12	49
	 FX-CR-MG-EDL		2 flutes, long shank, long cutlength 2 Schneiden, langer Schaft, Schneidenlänge : lang	6~12	50
	 FX-CR-MG-EHS		4 flutes, stub length 4 Schneiden, Schneidenlänge : kurz	6~25	50
	 FX-CR-MG-EMS		4 flutes, extra short cutlength 4 Schneiden, Schneidenlänge extra kurz	4~12	51
	 FX-CR-MG-EML		4 flutes, long serie, long shank 4 Schneiden, Lang, langer Schaft	6~20	51
	 FXS-HS-PKE		4 flutes radius, for deep wall applications 4 Schneiden, zentrumschneidend - Eckenradius	6~20	59
	 FXS-PKE		4 flutes radius, deep wall applications 4 Schneiden, zentrumschneidend, extra langer Schaft, Eckenradius	3~20	59
	 FXS-MFE		4 flutes radius at both ends, deep wall applications 4 Schneiden, Eckenradius vorne und hinten, extralanger Schaft	10~22	60
	 FXS-CR-EMS		6 or 8 flutes, long shank 6 oder 8 Schneiden, langer Schaft	6~25	60
	 CA-PKE		3 flutes, for deep wall applications 3 Schneiden, Eckenradius	3~20	70
	 CA-MFE		3 flutes radius at both ends, deep wall applications 3 Schneiden, Eckenradius vorne und hinten	10~22	70
<b>BALL NOSE END MILLS - MINIATUR-KOPIERFRÄSER</b>					
<b>NEW</b>	 WXL-LN-EBD		2 flutes, ball nose end mill for mat. ~ 50 HRC 2 Schneiden, Kopierfräser für mat. ~ 50 HRC	0.1~6	4
	 WXS-LN-EBD		2 flutes, for deep slotting 2 Schneiden, langer Hals - Überlaufhals	0.1~6	12
	 WX-LN-EBD		2 flutes, for deep slotting 2 Schneiden, langer Hals - Überlaufhals	0.1~3	27
	 FX-RB-EBD		2 flutes, for deep slotting 2 Schneiden, langer Hals - Überlaufhals	0.6~4	47
	 FX-LN-EBD-6		2 flutes, long serie, long neck, shank Ø 6 2 Schneiden, lang, langer Hals - Schaft D 6	0.5~6	47

ENGLISH  
GERMAN

## Index - Vorschau - Indice - Index

Appearance Gestalt	Type Typ	Coat. Beschichtung	Specification Ausführung	Range Durchmesser	
<b>BALL NOSE END MILLS - KOPIERFRÄSER</b>					
<b>NEW</b> 	WXL-EBD		2 flutes, ball nose end mill for mat. ~ 50 HRC 2 Schneiden, Kopierfräser für mat. ~ 50 HRC	0.1~20	3
<b>NEW</b> 	WXS-EBD		2 flutes, ball nose end mill for mat. > 50 HRC 2 Schneiden, Kopierfräser für mat. > 50 HRC	1~12	11
<b>NEW</b> 	WXS-HS-EBD		2 flutes, ball nose end mill for mat. > 50 HRC 2 Schneiden, Kopierfräser für mat. > 50 HRC	1~12	11
	WX-EBD		2 flutes, long shank 2 Schneiden, langer Schaft	0.4~12	26
	FX-HS-EBDS		2 flutes, long shank 2 Schneiden, langer Schaft	3~12	43
	FX-MG-EBD-3		2 flutes, ball nose, shank Ø 3 2 Schneiden, Kopierfräser, Schaftdurchmesser D 3	0.4~3	43
	FX-MG-EBD		2 flutes, long shank 2 Schneiden, langer Schaft	1~30	44
	FX-HO-MG-EBD		2 flutes, internal oil hole 2 Schneiden, mit innere Kühlmittelzufuhr	6~20	44
	FX-LS-MG-EBD		2 flutes, long shank 2 Schneiden, extra konischer langer Schaft	1~30	45
	FX-SS-EBD		2 flutes, extra long shank, slim shank - 2 Schneiden, extra langer Schaft, Schaftdurchmesser kleiner als Schneide	6~12	45
	FX-EBD-6		2 flutes, stub length, shank Ø 6 2 Schneiden, Schneidenlänge : kurz, Schaftdurchmesser D 6	0.2~6	46
	FX-PC-MG-EBD		2 flutes, pencil neck, long shank 2 Schneiden, konischer Schaft, langer Schaft	1~12	48
	FX-PCL-EBD		2 flutes, long pencil neck, long shank 2 Schneiden, konischer Schaft, langer Schaft	4~12	48
	FXS-HO-EBDS		2 flutes, long shank, with internal oil hole 2 Schneiden, langer Schaft mit innere Kühlmittelzufuhr	6~20	56
	FXS-EBDS		2 flutes, long shank, short cutlength 2 Schneiden, langer Schaft, Schneidenlänge : kurze	1~25	56
	FXS-EQD		2 flutes, long shank, 220° cutting edge 2 Schneiden, langer Schaft, 220° Kugel	1~10	57
	FXS-EBT		3 flutes, long shank 3 Schneiden, langer Schaft	6~20	57
	FXS-HS-EBM		4 flutes, normal shank 4 Schneiden, normaler Schaft	6~20	58
	FXS-EBM		4 flutes, long shank 4 Schneiden, langer Schaft	6~20	58
<b>NEW</b> 	CBN-SXB		2 flutes, ball nose end mill for mat. ~ 68 HRC 2 Schneiden, Kopierfräser für mat. ~ 68 HRC	0.4~3	66
	CAP-EBD		2 flutes, long shank, super finishing 2 Schneiden, langer Schaft, Super-finishing	1~20	69
	CRN-EBD		2 flutes, long shank, super finishing 2 Schneiden, langer Schaft, Super-finishing	6~12	73
	CRN-LN-EBD		2 flutes, long neck, super finishing 2 Schneiden, Überlaufhals, Super-finishing	1~5	73
	GF-EBDR		2 flutes, long serie, for milling of graphite 2 Schneiden, lange Schaft, für Graphit	2~12	75
	GX-EQD-SF		2 flutes, spherical 2 Schneiden, Schrumpfausführung	16~20	76
	GX-EBD-SF		2 flutes, ball nose 2 Schneiden, Kopierfräser	10~20	76
	DIA-EBD-SF		2 flutes, ball nose 2 Schneiden, Kopierfräser	10~12	78

ENGLISH  
GERMAN

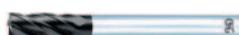
## MILLING - FRÄSEN - FRESATURA - FRAISAGE

## Index - Vorschau - Indice - Index

Appearance Gestalt	Type Typ	Coat. Beschichtung	Specification Ausführung	Range Durchmesser	
<b>SLOTTING END MILLS - MINIATUR-SCHAFTFRÄSER</b>					
		WX-LN-EDS	 2 flutes, for deep slotting 2 Schneiden, langer Hals - Überlaufhals	0.2~5	24
		FX-LN-EDS-6	 2 flutes, long serie, shank Ø 6 2 Schneiden, Schneidenlänge : lang, Schaftdurchmesser D 6	0.5~2.5	36
		FX-RB-EGS	 2 flutes, for deep slotting 2 Schneiden, langer Hals - Überlaufhals	0.5~3	37
		CRN-LN-EDS	 2 flutes, long neck 2 Schneiden, Überlaufhals	0.5~12	71
<b>SLOTTING END MILLS - SCHEIDEN SCHAFTFRÄSER</b>					
<b>NEW</b>		WXL-EDS	 2 flutes, for general use 2 Schneiden Schaftfräser für Allgemeine Anwendungen	0.1~12	1
		WX-G-EDSS	 2 flutes, cutlength extra short 2 Schneiden, Schneidenlänge : extra kurz	1~12	21
		WX-EDS	 2 flutes, stub length 2 Schneiden, Schneidenlänge : kurz	0.2~12	21
		FX-MG-EDSS	 2 flutes, cutlength extra short 2 Schneiden, Schneidenlänge : extra kurz	3~16	31
		FX-MG-EDS	 2 flutes, stub length 2 Schneiden, Schneidenlänge : kurz	0.2~30	32
		FX-MG-EDL	 2 flutes, long cutlength 2 Schneiden, Schneidenlänge : lang	1~30	34
		FX-MG-EXDL	 2 flutes, extra long cutlength 2 Schneiden, Schneidenlänge : extra lang	3~30	34
		FX-SS-EDS	 2 flutes, slim shank 2 Schneiden, Schaftdurchmesser kleiner als Schneide	6~12	35
		FX-EDS-6	 2 flutes, stub length, shank Ø 6 2 Schneiden, Schneidenlänge : kurz, Schaftdurchmesser D 6	0.2~2.5	35
		CA-RG-EDS	2 flutes, stub length, for Al. and Cu. alloys 2 Schneiden, Schaftdurchmesser kleiner als Schneide, für Aluminium und Kupfer Legierungen	1~20	67
		CA-RG-EDL	2 flutes, long serie, for Al. and Cu. alloys 2 Schneiden, Schaftdurchmesser kleiner als Schneide, für Aluminium und Kupfer Legierungen	3~12	67
		GF-EDR	2 flutes, long serie, for milling of graphite 2 Schneiden, lange Schaft, für Graphit	2~12	74
		GX-CR-EDS-SF	 2 flutes, with radius 2 Schneiden, Eckenradius	10~20	77
<b>MULTIFLUTE END MILLS - MEHRSCHEIDER</b>					
<b>NEW</b>		WXL-EMS	 4 flutes, for general use 4 Schneiden Schaftfräser für Allgemeine Anwendungen	1~30	2
<b>NEW</b>		UP-PHS	4 flutes, vibration resistant, multipurpose use 4 Schneiden, anti-vibration, für Allgemeine Anwendungen	3~12	9
<b>NEW</b>		WXS-EMS	 4,6 flutes for allied steels < 65 HRC 4,6 Schneiden für gelegierten Stahl < 65 HRC	1~12	10
		WX-G-ETSS	 3 flutes, for stainless steel, titanium and steel 3 Schneiden, für VA Stahl - Titan - und Stahl	3~16	22
		WX-G-EMSS	 4 flutes, cutlength extra short 4 Schneiden, Schneidenlänge : extra kurz	3~12	22
		WX-PHS	 4 flutes, for stainless steel, titanium and steel 4 Schneiden, für VA Stahl - Titan - und Stahl	3~20	23
		WX-EMS	 4 flutes, stub length 4 Schneiden, Schaftdurchmesser kleiner als Schneide	2~9	23
		FX-MG-EMSS	 4 flutes, cutlength extra short 4 Schneiden, Schneidenlänge : extra kurz	3~16	38
		FX-MG-EMS	 4 flutes, stub length 4 Schneiden, Schneidenlänge : kurz	2~30	38

ENGLISH  
GERMAN

## Index - Vorschau - Indice - Index

Appearance Gestalt	Type Typ	Coat. Beschichtung	Specification Ausführung	Range Durchmesser	
	FX-MG-EML		4 flutes, long serie 4 Schneiden, langer Schaft	3~30	39
	FX-MG-EXML		4 Schneiden, extra langer Schaft 4 flutes, extra long serie	3~30	39
	FX-SS-EMS		4 flutes, long shank, slim shank 4 Schneiden, langer Schaft	6~12	40
	FX-MG-EHL		3 flutes, long serie 3 Schneiden, lange Schaft	6~12	41
	FX-MG-EHS		3 or 4 flutes, stub length 3 oder 4 Schneiden, Schaftdurchmesser kleiner als Schneide	3~25	41
	FXS-EMSS		4 or 6 flutes, super long tool life 4 oder 6 Schneiden, extra lange Werkzeuglebensdauer	1~12	54
	FXS-EMS		4, 6 or 8 flutes, stub length 4, 6 oder 8 Schneiden, Schaftdurchmesser kleiner als Schneide	1~30	54
	FXS-LS-EMS		4, 6 or 8 flutes, long shank 4, 6 oder 8 Schneiden, langer Schaft	3~30	55
	FXS-EML		6 or 8 flutes, long serie 6 oder 8 Schneiden, lange Schaft	6~25	55
	FXS-HPE		4 flutes, extra long shank, for slotting 4 Schneiden, extra langer Schaft	10~22	55
	FX-LN-EMS-6		4 flutes, long neck, shank Ø 6 4 Schneiden, langer Schaft, Schaftdurchmesser Ø 6	1~6	40
	CA-ETS		3 flutes, stub length 3 Schneiden, Schneidenlänge : kurz	3~20	68
	CRN-EMS		4 flutes, stub length, finishing Al., Cu and plastic 4 Schneiden, Schaftdurchmesser kleiner als Schneide, für Alu - Kupfer Legierungen, plastik	3~12	72

## TAPER END MILLS - MINIATUR-KONUSFRÄSER

	FXS-RB-TPE		Multiflute, deep slotting Multischneiden, Über laufhals	0.5~3	61
	FXS-RB-TPB		Multiflute, ball nose, deep slotting Multischneiden, Kopierfräser, Über laufhals	0.6~2.5	63
	FXS-RB-TPCR		Multiflute, radius, deep slotting Multischneiden, Eckenradius, Über laufhals	1~1.5	65

## TAPER END MILLS - KONUSFRÄSER

	FX-MG-TPDS		2 flutes, stub length 2 Schneiden, Schneidenlänge : kurz	1~10	52
	FX-MG-TPMS		Multiflute, stub length Multischneiden, Schneidenlänge : kurz	3~10	53

## ROUGHING END MILLS - SCHRUPPFRÄSER

	HYP-HP-RESF		4 flutes, for roughing 4 Schneiden, Schrufffräser	6~25	42
	FX-MG-REE		4 flutes, long shank 4 Schneiden, langer Schaft	6~20	42

## MILLING - FRÄSEN - FRESATURA - FRAISAGE

## Index - Vorschau - Indice - Index

Come si presenta Apparence	Tip Type	Rivestimento Revêtement	Caratteristiche Spécifications	Dimensioni Dim.	
<b>FRESE TORICHE - FRAISES TORIQUES</b>					
		WX-HS-CRE	 4 denti, serie extra corta, gambo corto 4 lèvres, série courte	6~12	29
		WX-CRE	 3 o 4 denti, serie extra corta, gambo lungo 3 ou 4 lèvres, queue longue	2~13	29
<b>FRESE TORICHE - FRAISES A RAYON</b>					
<b>NEW</b>		WXS-CPR	 2 denti, frese toriche 2 lèvres, fraise à rayon	0.1~2	16
		WX-CR-PHS	 4 denti, serie corta 4 lèvres, grande profondeur de coupe	3~20	30
		FX-CR-EDS-6	 2 denti, serie corta, gambo diametro 6 2 lèvres, série courte, queue dia 6	0.6~2.5	49
		FX-CR-MG-EDS	 2 denti, serie corta, gambo lungo 2 lèvres, queue longue, longueur de coupe courte	3~12	49
		FX-CR-MG-EDL	 2 denti, serie lunga, gambo lungo 2 lèvres, queue longue, longueur de coupe longue	6~12	50
		FX-CR-MG-EHS	 4 denti, serie corta 4 lèvres, série courte	6~25	50
		FX-CR-MG-EML	 4 denti, serie lunga, gambo lungo 4 lèvres, série longue, queue longue	4~12	51
		FX-CR-MG-EMS	 4 denti, serie extra corta 4 lèvres, série courte	6~20	51
		FXS-HS-PKE	 4 denti toriche, gambo lungo, per fresatura di pareti pro- fonde 4 lèvres à rayon, fraisage de cavités profondes	6~20	59
		FXS-PKE	 4 denti toriche, gambo lungo, per fresatura di pareti pro- fonde 4 lèvres à rayon, fraisage de cavités profondes	3~20	59
		FXS-MFE	 4 denti, gambo extra lungo con raggio anteriore e posteriore 4 lèvres à rayon avant et arrière pour parois profondes	10~22	60
		FXS-CR-EMS	 6 o 8 denti, gambo lungo 6 ou 8 lèvres, queue longue	6~25	60
		CA-PKE	3 denti a raggio, anteriore e posteriore per alluminio, per fresatura di cavità profonde 3 lèvres, pour fraisage de cavités profondes	3~20	70
		CA-MFE	3 denti a raggio, anteriore e posteriore per alluminio, gambo extra lungo, per pareti profonde 3 lèvres à rayon avant et arrière, pour parois profondes	10~22	70
<b>MICROFRESE SFERICHE PER NERVATURE - MICROFRAISE HEMISPHERIQUES</b>					
<b>NEW</b>		WXL-LN-EBD	 2 denti, frese sferiche per mat. ~ 50 HRC 2 lèvres, fraise hémisphérique pour mat. ~ 50 HRC	0.1~6	4
		WXS-LN-EBD	 2 denti, per scanalature profonda 2 lèvres, pour rainurage profond	0.1~6	12
		WX-LN-EBD	 2 denti, per scanalature profonda 2 lèvres, pour rainurage profond	0.1~3	27
		FX-RB-EBD	 2 denti, per scanalature profonda 2 lèvres, pour rainurage profond	0.6~4	47
		FX-LN-EBD-6	 2 denti, serie lunga, per scanalature profonda, gambo dia 6 2 lèvres, série longue, dégagement long, queue dia 6	0.5~6	47

ITALIAN  
FRENCH

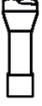
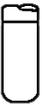
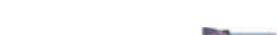
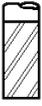
## Index - Vorschau - Indice - Index

Come si presenta Apparence	Tipo Type	Rivestimento Revêtement	Caratteristiche Spécifications	Dimensioni Dim.	
<b>FRAISE SFERICHE - FRAISES HEMISPHERIQUES</b>					
<b>NEW</b> 	WXL-EBD		2 denti, frese sferiche per mat. ~ 50 HRC 2 lèvres, fraise hémisphérique pour mat. ~ 50 HRC	0.1~20	3
<b>NEW</b> 	WXS-EBD		2 denti, frese sferiche per mat. > 50 HRC 2 lèvres, fraise hémisphérique pour mat. > 50 HRC	1~12	11
<b>NEW</b> 	WXS-HS-EBD		2 denti, frese sferiche per mat. > 50 HRC 2 lèvres, fraise hémisphérique pour mat. > 50 HRC	1~12	11
	WX-EBD		2 denti, gambo lungo 2 lèvres, queue longue	0.4~12	26
	FX-HS-EBDS		2 denti, gambo corto 2 lèvres, queue longue	3~12	43
	FX-MG-EBD-3		2 denti, micro frese, gambo diametro 3 2 lèvres, boule miniature, queue dia 3	0.4~3	43
	FX-MG-EBD		2 denti, gambo lungo 2 lèvres, queue longue	1~30	44
	FX-HO-MG-EBD		2 denti, confori di lubrificazione 2 lèvres, avec trou d'huile	6~20	44
	FX-LS-MG-EBD		2 denti, gambo extra lungo 2 lèvres, queue extra longue	1~30	45
	FX-SS-EBD		2 denti, gambo extra lungo, dia di gambo inferiore al dia di taglio 2 lèvres, queue extra longue, dia queue < dia coupe	6~12	45
	FX-EBD-6		2 denti, serie corta, gambo diametro 6 2 lèvres, série courte, queue dia 6	0.2~6	46
	FX-PC-MG-EBD		2 denti, riduzione conica, gambo lungo 2 lèvres, dégagement conique, queue longue	1~12	48
	FX-PCL-EBD		2 denti, riduzione conica, gambo lungo 2 lèvres, dégagement conique, queue longue	4~12	48
	FXS-HO-EBDS		2 denti, gambo lugo, lunghezza di taglio corta, con fori di lubrificazione 2 lèvres, queue longue, avec trou d'huile	6~20	56
	FXS-EBDS		2 denti, gambo lungo, lunghezza di taglio corta 2 lèvres, queue longue, longueur de coupe courte	1~25	56
	FXS-EQD		2 denti, gambo lungo, 220° 2 lèvres, queue longue, sphérique 220°	1~10	57
	FXS-EBT		3 denti, gambo lungo 3 lèvres, queue longue	6~20	57
	FXS-HS-EBM		4 flutes, normal shank 4 lèvres, queue courte	6~20	58
	FXS-EBM		4 denti, gambo lungo 4 lèvres, queue longue	6~20	58
<b>NEW</b> 	CBN-SXB		2 denti, frese sferiche per mat. ~ 68 HRC 2 lèvres, fraise hémisphérique pour mat. ~ 68 HRC	0.4~3	66
	CAP-EBD		2 denti, gambo lungo, per rame, alluminio e plastica 2 lèvres, queue longue, pour super finition	1~20	69
	CRN-EBD		2 denti, gambo lungo, per rame, alluminio e plastica 2 lèvres, queue longue, pour super finition	6~12	73
	CRN-LN-EBD		2 denti, gambo scaricato lungo, per alluminio, rame e plastica 2 lèvres, dégagement long, super finition	1~5	73
	GF-EBDR		2 denti, serie lunga, per lavorazione su grafite 2 lèvres, série longue pour usinage du graphite	2~12	75
	GX-EQD-SF		2 denti, specifico 220° 2 lèvres, type sphérique 220°	16~20	76
	GX-EBD-SF		2 denti, sviluppate specialmente per il calettamento 2 lèvres, boule	10~20	76
	DIA-EBD-SF		2 denti, sviluppate specialmente per il calettamento 2 lèvres, boule	10~12	78

ITALIAN  
FRENCH

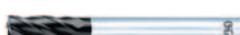
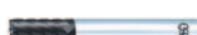
## MILLING - FRÄSEN - FRESATURA - FRAISAGE

## Index - Vorschau - Indice - Index

Come si presenta Apparence	Tipo Type	Rivestimento Revêtement	Caratteristiche Spécifications	Dimensioni Dim.	
<b>MICROFRESE PER NERVATURE - MICROFRAISES A RAINURER</b>					
		WX-LN-EDS	 2 denti, per scanalature profonde 2 lèvres, pour rainurage profond	0.2~5	24
		FX-LN-EDS-6	 2 denti, serie lunga, gambo dia 6 2 lèvres, série longue, queue dia 6	0.5~2.5	36
		FX-RB-EGS	 2 denti, per scanalature profonda 2 lèvres, pour rainurage profond	0.5~3	37
		CRN-LN-EDS	 2 denti, riduzione lunga, per alluminio 2 lèvres, dégageement long	0.5~12	71
<b>FRESE PER SCANALATURE - FRAISES A RAINURER</b>					
		WXL-EDS	 2 denti, frese per una vasta gamma di applicazioni 2 lèvres, fraise multi fonction	1~12	1
		WX-G-EDSS	 2 denti, serie extra corta 2 lèvres, longueur de coupe extra courte	1~12	21
		WX-EDS	 2 denti, serie corta 2 lèvres, série courte	0.2~12	21
		FX-MG-EDSS	 2 denti, extra corta 2 lèvres, longueur de coupe extra courte	3~16	31
		FX-MG-EDS	 2 denti, serie corta 2 lèvres, série courte	0.2~30	32
		FX-MG-EDL	 2 denti, lunghezza di taglio lunga 2 lèvres, longueur de coupe longue	1~30	34
		FX-MG-EXDL	 2 denti, lunghezza di taglio extra lunga 2 lèvres, longueur de coupe extra longue	3~30	34
		FX-SS-EDS	 2 denti, serie corta, dia del gambo inferiore al dia del taglio 2 lèvres, dia queue inférieur au dia de coupe	6~12	35
		FX-EDS-6	 2 denti, serie corta, gambo dia 6 2 lèvres, série courte, queue dia 6	0.2~2.5	35
		CA-RG-EDS	2 denti, serie corta, per leghe di alluminio e rame 2 lèvres, série courte, pour alliages Al et Cu	1~20	67
		CA-RG-EDL	2 denti, serie lunga, per leghe di alluminio e rame 2 lèvres, série courte, pour alliages Al et Cu	3~12	67
		GF-EDR	2 denti, serie lunga, per lavorazione su grafite 2 lèvres, série longue, pour usinage du graphite	2~12	74
	GX-CR-EDS-SF	 2 denti, raggio d'angolo 2 lèvres, à rayon, spécial frettage	10~20	77	
<b>FRESE MULTIDENTI - FRAISES MULTILEVRES</b>					
		WXL-EMS	 4 denti, frese per una vasta gamma di applicazioni 4 lèvres, fraise multi-fonction	1~30	2
		UP-PHS	4 denti, resistente alle vibrazioni, multifunzione 4 lèvres, résistante aux vibrations, multi-fonction	3~12	9
		WXS-EMS	 4 o 6 denti, per acciai temperato 4 ou 6 lèvres, pour aciers durs	1~12	10
		WX-G-ETSS	 3 denti, serie corta 3 lèvres, pour inox, titane et aciers	3~16	22
		WX-G-EMSS	 4 denti, serie extra corta 4 lèvres, longueur de coupe extra courte	3~12	22
		WX-PHS	 4 denti, gambo lungo 4 lèvres, pour inox, titane et aciers	3~20	23
		WX-EMS	 4 denti, serie corta 4 lèvres, série courte	2~9	23

ITALIAN  
FRENCH

## Index - Vorschau - Indice - Index

Come si presenta Apparence	Tipo Type	Rivestimento Revêtement	Caratteristiche Spécifications	Dimensioni Dim.	
	FX-MG-EMSS		4 denti, extra corta 4 lèvres, longueur de coupe extra courte	3~16	38
	FX-MG-EMS		4 denti, serie corta 4 lèvres, série courte	2~30	38
	FX-MG-EML		4 denti, lunga 4 lèvres, série longue	3~30	39
	FX-MG-EXML		4 denti, lunghezza di taglio extra lunga 4 lèvres, série extra longue	3~30	39
	FX-SS-EMS		4 denti, gambo lunga 4 lèvres, queue longue	6~12	40
	FX-MG-EHL		3 denti lunga 3 lèvres, série longue	6~12	41
	FX-MG-EHS		3 o 4 denti, corta 3 ou 4 lèvres, série courte	3~25	41
	FXS-EMSS		4 o 6 denti, serie extra corta 4 ou 6 lèvres, super longue vie	1~12	54
	FXS-EMS		4, 6 o 8 denti, serie corta 4,6 ou 8 lèvres, série courte	1~30	54
	FXS-LS-EMS		4, 6 o 8 denti, gambo lungo 4,6 ou 8 lèvres, queue longue	3~30	55
	FXS-EML		6 o 8 denti, serie lunga 6 ou 8 lèvres, série longue	6~25	55
	FXS-HPE		6 o 8 denti, serie lunga 6 ou 8 lèvres, série longue	10~22	55
	FX-LN-EMS-6		4 denti, gambo extra lungo, per scanalature 4 lèvres, queue extra longue, pour rainurage	1~6	40
	CA-ETS		3 denti serie cortan per alluminio 3 lèvres, série courte	3~20	68
	CRN-EMS		4 denti, serie corta, per finiture su alluminio, rame e plastica 4 lèvres, série courte, finition Al,Cu et des plastiques	3~12	72
<b>MICROFRESE CONICHE PER NERVATURE - MICROFRAISES CONIQUES</b>					
	FXS-RB-TPE		Multidenti coniche, per scanalature profonda Multi-lèvres, rainurage profond	0.5~3	61
	FXS-RB-TPB		Multidenti coniche a sfera per scanalature profonda Multi-lèvres, boule, rainurage profond	0.6~2.5	63
	FXS-RB-TPCR		Multidenti coniche a raggio per scanalature profonda Multi-lèvres à rayon, rainurage profond	1~1.5	65
<b>FRESE CONICHE PER NERVATURE - FRAISES CONIQUES</b>					
	FX-MG-TPDS		2 denti, serie corta 2 lèvres, série courte	1~10	52
	FX-MG-TPMS		Multidenti, serie corta Multi-lèvres, série courte	3~10	53
<b>FRESE A SGROSSARE - FRAISES EBAUCHES</b>					
	HYP-HP-RESF		4 denti, frese a sgrossare 4 lèvres, fraise pour l'ébauche	6~25	42
	FX-MG-REE		Multidenti, gambo lungo 4 lèvres, queue longue	6~20	42



VIBRATION-RESISTANT, MULTIPURPOSE END MILL  
ANTI-VIBRATION, ALLGEMEINE ANWENDUNGEN  
FRESA MULTIFUNZIONE , RESISTENTE ALLE VIBRAZIONI  
FRAISE MULTI-FONCTION , ANTI-VIBRATOIRE

**UP-PHS** PAT.P.

IT HAS REACHED THIS FAR  
IT HAS REACHED THIS FAR  
IL RISULTATO DEL NOSTRO  
PROGRESSO  
L'AVENIR EST LA



**VIBRATION-RESISTANT END MILL  
FRASEN ANTI-VIBRATION  
FRESA RESISTENTE ALLE VIBRAZIONE  
FRAISE ANTI-VIBRATOIRE**

Productivity  
X 2.5  
Life time  
X 1.8



Produktivität  
X 2.5  
Lebensdauer  
X 1.8



Produttività  
X 2.5  
Durata  
X 1.8



Productivité  
X 2.5  
Durée de vie  
X 1.8





A SINGLE TOOL HANDLES FROM COPPER TO MATERIALS UP TO 50 HRC

EINE WERKZEUGE FÜR BEARBEITUNGEN VON KUPFER BIS ZU WERKSTOFFEN MIT 50 HRC

UN ' UNICO UTENSILE DAL RAME AI MATERIALI TEMPRATI FINO A 50 HRC

UN OUTIL UNIQUE PEUT USINER DU CUIVRE JUSQU ' A DES MATIERES DE 50 HRC

**WXL** PAT.P.



**NEW COATING WXL END MILL SERIES**  
**WXL · NEUESTE VHM FRASER BESCHICHTUNG**  
**NUOVA SERIE DI FRESE CON RIVESTIMENTO WXL**  
**NOUVELLE SERIE DE FRAISES AVEC REVETEMENT WXL**

**WXL**

▶ The new WXL coating excels in lubricity and wear resistance to accommodate a wide range of applications.

▶ Die neue WXL-Beschichtung ist nochmals verbessert in ihrer Oberflächengüte und Verschleißfestigkeit um einen sehr großen Anwendungsbereich abzudecken.

▶ Il nuovo rivestimento WXL eccelle in proprietà lubrificante e resistenza all'usura, impiegato in un'ampia gamma di applicazioni.

▶ Le nouveau revêtement WXL excelle dans ses capacités lubrifiantes et dans sa résistance à l'usure afin de l'utiliser dans un grand éventail d'application.

Slotting end mills - 2 Schneiden Schafffräser - Frese per nervature - Fraises à rainurer

**NEW**

\* HIGH PERFORMANCE

**NEU**

\* HIGH PERFORMANCE

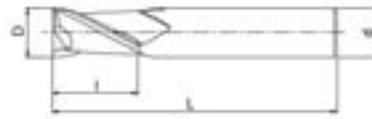
**NUOVO**

\* ALTA PERFORMANCE

**NOUVEAU**

\* HAUTE PERFORMANCE

**WXL-EDS**



EDP	D	L	l	d	€
3130001	0.1	40	0.2	4	
3130002	0.2	40	0.4	4	
3130003	0.3	40	0.6	4	
3130004	0.4	40	0.8	4	
3130005	0.5	40	1	4	
3130006	0.6	40	1.2	4	
3130007	0.7	40	1.4	4	
3130008	0.8	40	1.6	4	
3130009	0.9	40	2	4	
3130010	1	40	2.5	4	
3130011	1.1	40	2.5	4	
3130012	1.2	40	4	4	
3130013	1.3	40	4	4	
3130014	1.4	40	4	4	
3130015	1.5	40	4	4	
3130016	1.6	40	5	4	
3130017	1.7	40	5	4	
3130018	1.8	40	5	4	
3130019	1.9	40	5	4	

EDP	D	L	l	d	€
3130020	2	40	6	4	
3130025	2.5	40	8	4	
3130028	2.8	40	8	4	
3130030	3	45	8	6	
3130035	3.5	45	10	6	
3130040	4	45	11	6	
3130045	4.5	45	11	6	
3130050	5	50	13	6	
3130055	5.5	50	13	6	
3130060	6	50	13	6	
3130065	6.5	60	16	8	
3130070	7	60	16	8	
3130075	7.5	60	16	8	
3130080	8	60	19	8	
3130090	9	70	19	10	
3130100	10	70	22	10	
3130110	11	75	22	12	
3130120	12	75	26	12	

**WXL**



Applications - Anwendungen - Applicazioni - Applications														
WXL-EDS	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.	
	⊙	⊙	⊙			⊙	⊙	⊙	○		○	○		

## Multi purpose end mills - Mehrschneider - Fresa multifunzione - Fraises multifonction

**NEW**

\* HIGH PERFORMANCE

**NEU**

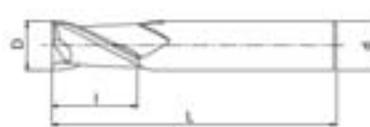
\* HIGH PERFORMANCE

**NUOVO**

\* ALTA PERFORMANCE

**NOUVEAU**

\* HAUTE PERFORMANCE

**WXL-EMS**

0~-0.02

P. 80



EDP	D	L	l	d	€
3130510	1	40	2.5	4	
3130515	1.5	40	4	4	
3130520	2	40	6	4	
3130525	2.5	40	8	4	
3130530	3	45	8	6	
3130535	3.5	45	10	6	
3130540	4	45	11	6	
3130545	4.5	45	11	6	
3130550	5	50	13	6	
3130560	6	50	13	6	
3130570	7	60	16	8	

EDP	D	L	l	d	€
3130580	8	60	19	8	
3130590	9	70	19	10	
3130600	10	70	22	10	
3130620	12	75	26	12	
3130640	14	85	26	12	
3130650	15	90	26	16	
3130660	16	100	32	16	
3130680	18	100	32	16	
3130700	20	105	38	20	
3130750	25	120	45	25	
3130800	30	125	45	32	

**WXL**

	Applications		- Anwendungen			- Applicazioni			- Applications				
WXL-EMS	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
	⊙	⊙	⊙			⊙	⊙	⊙	○		○	○	

## Ball nose end mills - Kopierfräser - Frese sferiche - Fraises hémisphériques

**NEW**

\* HIGH PERFORMANCE

**NEU**

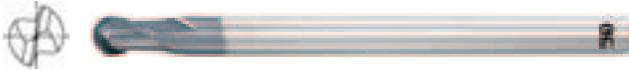
\* HIGH PERFORMANCE

**NUOVO**

\* ALTA PERFORMANCE

**NOUVEAU**

\* HAUTE PERFORMANCE

**WXL-EBD**

R &lt; 3   3 ≤ R ≤ 6   6 &lt; R   P. 81



EDP	R	L	l	d	€
3105010	0.05	40	0.2	4	
3105020	0.1	40	0.4	4	
3105030	0.15	40	0.6	4	
3106030	0.15	50	0.6	6	
3105040	0.2	40	0.8	4	
3106040	0.2	50	0.8	6	
3105050	0.25	40	1.1	4	
3106050	0.25	50	1.1	6	
3105060	0.3	40	1.1	4	
3106060	0.3	50	1.1	6	
3105080	0.4	40	2	4	
3106080	0.4	50	2	6	
3105100	0.5	50	1.5	4	
3105101	0.5	50	2.5	4	
3106100	0.5	60	2.5	6	
3105120	0.6	50	3	4	
3105140	0.7	50	3.5	4	
3105150	0.75	50	2	4	
3105151	0.75	50	4	4	
3106150	0.75	50	4	6	
3105160	0.8	50	4	4	
3105200	1	50	3	4	
3105201	1	50	6	4	
3106200	1	50	5	6	
3105250	1.25	50	3	4	
3105251	1.25	50	6	4	

EDP	R	L	l	d	€
3106250	1.25	60	6	6	
3105300	1.5	60	4.5	4	
3106300	1.5	60	4.5	6	
3106301	1.5	60	8	6	
3106350	1.75	70	8	6	
3106400	2	70	6	6	
3105400	2	60	8	4	
3106401	2	70	8	6	
3106500	2.5	80	8	6	
3106501	2.5	80	10	6	
3106502	2.5	80	12	6	
3106600	3	90	10	6	
3106601	3	90	12	6	
3106610	3.5	90	14	6	
3106620	4	100	12	8	
3106621	4	100	14	8	
3106630	4.5	100	18	8	
3106640	5	100	15	10	
3106641	5	100	18	10	
3106650	5.5	100	22	10	
3106660	6	110	18	12	
3106661	6	110	22	12	
3106670	7	110	26	12	
3106680	8	140	30	16	
3106690	9	140	34	16	
3106700	10	160	38	20	

**WXL**

WXL-EBD	Applications - Anwendungen - Applicazioni - Applications													
	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.	
	⊙	⊙	⊙			⊙	⊙	⊙	○		○	○		

Ball nose end mills - Miniatur-Kopierfräser - Microfresa sferiche per nervature - Microfraises hémisphériques

**NEW**

\* HIGH PERFORMANCE

**NEU**

\* HIGH PERFORMANCE

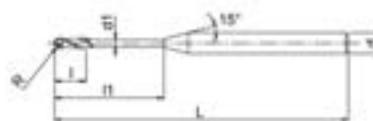
**NUOVO**

\* ALTA PERFORMANCE

**NOUVEAU**

\* HAUTE PERFORMANCE

**WXL-LN-EBD**



P. 82-88



**WXL**



EDP	R	l1	L	l	d	d1	θ	α (Le)						€
								0.5°	1°	1.5°	2°	2.5°	3°	
3110103	0.05	0.3	45	0.08	4	0.085	13.59	0.32	0.35	0.39	0.43	0.48	0.54	
3110105	0.05	0.5	45	0.08	4	0.085	13.27	0.54	0.59	0.65	0.72	0.79	0.88	
3110203	0.1	0.3	45	0.16	4	0.18	13.93	0.32	0.34	0.37	0.4	0.44	0.49	
3110205	0.1	0.5	45	0.16	4	0.18	13.59	0.54	0.58	0.63	0.69	0.76	0.83	
3120205	0.1	0.5	50	0.16	6	0.18	14.04	0.54	0.58	0.63	0.69	0.76	0.83	
3110207	0.1	0.75	45	0.16	4	0.18	13.2	0.81	0.88	0.96	1.04	1.13	1.23	
3110210	0.1	1	45	0.16	4	0.18	12.83	1.08	1.18	1.27	1.38	1.49	1.61	
3120210	0.1	1	50	0.16	6	0.18	13.49	1.08	1.18	1.27	1.38	1.49	1.61	
3110212	0.1	1.25	45	0.16	4	0.18	12.48	1.36	1.47	1.59	1.71	1.84	1.98	
3110215	0.1	1.5	45	0.16	4	0.18	12.14	1.63	1.76	1.9	2.04	2.18	2.33	
3120215	0.1	1.5	50	0.16	6	0.18	12.98	1.63	1.76	1.9	2.04	2.18	2.33	
3110217	0.1	1.75	45	0.16	4	0.18	11.83	1.9	2.05	2.2	2.36	2.52	2.68	
3110220	0.1	2	45	0.16	4	0.18	11.53	2.17	2.34	2.51	2.68	2.85	3.02	
3120220	0.1	2	50	0.16	6	0.18	12.51	2.17	2.34	2.51	2.68	2.85	3.02	
3110225	0.1	2.5	45	0.16	4	0.18	10.97	2.71	2.91	3.11	3.3	3.49	3.68	
3110230	0.1	3	45	0.16	4	0.18	10.46	3.25	3.48	3.7	3.92	4.13	4.33	
3110305	0.15	0.5	45	0.24	4	0.28	13.9	0.53	0.57	0.62	0.67	0.73	0.8	
3110306	0.15	0.6	45	0.24	4	0.28	13.74	0.64	0.69	0.75	0.81	0.89	0.97	
3110307	0.15	0.75	45	0.24	4	0.28	13.49	0.81	0.87	0.94	1.02	1.11	1.21	
3110310	0.15	1	45	0.24	4	0.28	13.1	1.08	1.17	1.26	1.36	1.47	1.59	
3120310	0.15	1	50	0.24	6	0.28	13.69	1.08	1.17	1.26	1.36	1.47	1.59	
3110312	0.15	1.25	45	0.24	4	0.28	12.74	1.35	1.46	1.58	1.7	1.82	1.96	
3110315	0.15	1.5	45	0.24	4	0.28	12.39	1.62	1.75	1.89	2.02	2.17	2.31	
3120315	0.15	1.5	50	0.24	6	0.28	13.17	1.62	1.75	1.89	2.02	2.17	2.31	
3110317	0.15	1.75	45	0.24	4	0.28	12.06	1.89	2.04	2.19	2.35	2.5	2.66	
3110320	0.15	2	45	0.24	4	0.28	11.75	2.16	2.33	2.5	2.66	2.83	3	
3120320	0.15	2	50	0.24	6	0.28	12.68	2.16	2.33	2.5	2.66	2.83	3	
3110322	0.15	2.25	45	0.24	4	0.28	11.45	2.44	2.62	2.8	2.98	3.16	3.33	
3110325	0.15	2.5	45	0.24	4	0.28	11.17	2.7	2.9	3.1	3.29	3.48	3.66	
3120325	0.15	2.5	50	0.24	6	0.28	12.23	2.7	2.9	3.1	3.29	3.48	3.66	
3110327	0.15	2.75	45	0.24	4	0.28	10.9	2.97	3.19	3.4	3.6	3.8	3.99	
3110330	0.15	3	45	0.24	4	0.28	10.64	3.24	3.47	3.69	3.91	4.11	4.31	
3120330	0.15	3	50	0.24	6	0.28	11.81	3.24	3.47	3.69	3.91	4.11	4.31	
3110335	0.15	3.5	45	0.24	4	0.28	10.17	3.78	4.04	4.28	4.51	4.74	4.95	
3110340	0.15	4	45	0.24	4	0.28	9.73	4.32	4.6	4.87	5.11	5.35	5.58	
3110345	0.15	4.5	45	0.24	4	0.28	9.33	4.85	5.16	5.44	5.71	5.96	6.2	
3110350	0.15	5	45	0.24	4	0.28	8.95	5.39	5.72	6.02	6.3	6.56	6.81	
3110405	0.2	0.5	45	0.3	4	0.37	14.28	0.53	0.56	0.6	0.64	0.69	0.75	
3110407	0.2	0.75	45	0.3	4	0.37	13.85	0.8	0.86	0.92	0.99	1.07	1.16	
3110410	0.2	1	45	0.3	4	0.37	13.44	1.07	1.15	1.24	1.33	1.43	1.54	
3120410	0.2	1	50	0.3	6	0.37	13.93	1.07	1.15	1.24	1.33	1.43	1.54	
3110415	0.2	1.5	45	0.3	4	0.37	12.69	1.61	1.73	1.86	1.99	2.12	2.26	
3120415	0.2	1.5	50	0.3	6	0.37	13.39	1.61	1.73	1.86	1.99	2.12	2.26	
3110420	0.2	2	45	0.3	4	0.37	12.02	2.15	2.31	2.47	2.63	2.79	2.95	
3120420	0.2	2	50	0.3	6	0.37	12.89	2.15	2.31	2.47	2.63	2.79	2.95	
3110425	0.2	2.5	45	0.3	4	0.37	11.41	2.69	2.88	3.07	3.25	3.43	3.61	
3120425	0.2	2.5	50	0.3	6	0.37	12.42	2.69	2.88	3.07	3.25	3.43	3.61	
3110430	0.2	3	45	0.3	4	0.37	10.87	3.23	3.45	3.66	3.87	4.07	4.26	
3120430	0.2	3	50	0.3	6	0.37	11.99	3.23	3.45	3.66	3.87	4.07	4.26	
3110435	0.2	3.5	45	0.3	4	0.37	10.37	3.77	4.01	4.25	4.47	4.69	4.9	
3110440	0.2	4	45	0.3	4	0.37	9.91	4.3	4.58	4.83	5.07	5.31	5.53	
3120440	0.2	4	50	0.3	6	0.37	11.21	4.3	4.58	4.83	5.07	5.31	5.53	

## Ball nose end mills - Miniatur-Kopierfräser - Microfresa sferiche per nervature - Microfraises hémisphériques

WXL-LN-EBD



EDP	R	l1	L	l	d	d1	θ	α (Le)						€
								0.5°	1°	1.5°	2°	2.5°	3°	
3110445	0.2	4.5	45	0.3	4	0.37	9.5	4.84	5.13	5.41	5.67	5.91	6.15	
3110450	0.2	5	45	0.3	4	0.37	9.11	5.37	5.69	5.98	6.26	6.52	6.76	
3120450	0.2	5	50	0.3	6	0.37	10.52	5.37	5.69	5.98	6.26	6.52	6.76	
3110455	0.2	5.5	45	0.3	4	0.37	8.76	5.9	6.25	6.56	6.84	7.11	7.37	
3110460	0.2	6	45	0.3	4	0.37	8.43	6.43	6.8	7.12	7.42	7.71	7.97	
3120460	0.2	6	50	0.3	6	0.37	9.91	6.43	6.8	7.12	7.42	7.71	7.97	
3110510	0.25	1	45	0.4	4	0.45	13.84	1.06	1.13	1.2	1.28	1.37	1.47	
3110515	0.25	1.5	45	0.4	4	0.45	13.04	1.6	1.71	1.82	1.94	2.06	2.19	
3120515	0.25	1.5	50	0.4	6	0.45	13.65	1.6	1.71	1.82	1.94	2.06	2.19	
3110520	0.25	2	45	0.4	4	0.45	12.34	2.14	2.28	2.42	2.57	2.72	2.87	
3120520	0.25	2	50	0.4	6	0.45	13.13	2.14	2.28	2.42	2.57	2.72	2.87	
3110525	0.25	2.5	45	0.4	4	0.45	11.7	2.67	2.85	3.02	3.19	3.37	3.54	
3120525	0.25	2.5	50	0.4	6	0.45	12.64	2.67	2.85	3.02	3.19	3.37	3.54	
3110530	0.25	3	45	0.4	4	0.45	11.12	3.21	3.41	3.61	3.81	4	4.19	
3120530	0.25	3	50	0.4	6	0.45	12.2	3.21	3.41	3.61	3.81	4	4.19	
3110535	0.25	3.5	45	0.4	4	0.45	10.6	3.74	3.97	4.2	4.41	4.62	4.82	
3110540	0.25	4	45	0.4	4	0.45	10.13	4.28	4.53	4.78	5.01	5.23	5.45	
3120540	0.25	4	50	0.4	6	0.45	11.39	4.28	4.53	4.78	5.01	5.23	5.45	
3110545	0.25	4.5	45	0.4	4	0.45	9.69	4.81	5.09	5.35	5.6	5.84	6.07	
3110550	0.25	5	45	0.4	4	0.45	9.29	5.34	5.65	5.93	6.19	6.44	6.68	
3120550	0.25	5	50	0.4	6	0.45	10.68	5.34	5.65	5.93	6.19	6.44	6.68	
3110555	0.25	5.5	45	0.4	4	0.45	8.93	5.87	6.2	6.5	6.77	7.04	7.29	
3110560	0.25	6	45	0.4	4	0.45	8.59	6.4	6.75	7.06	7.35	7.63	7.89	
3120560	0.25	6	50	0.4	6	0.45	10.05	6.4	6.75	7.06	7.35	7.63	7.89	
3110570	0.25	7	45	0.4	4	0.45	7.98	7.46	7.85	8.19	8.51	8.8	9.08	
3110580	0.25	8	45	0.4	4	0.45	7.45	8.52	8.94	9.31	9.65	9.96	10.42	
3120580	0.25	8	50	0.4	6	0.45	8.99	8.52	8.94	9.31	9.65	9.96	10.42	
3110590	0.25	9	45	0.4	4	0.45	6.99	9.57	10.03	10.42	10.78	11.11	11.66	
3110600	0.25	10	45	0.4	4	0.45	6.58	10.62	11.11	11.53	11.91	12.41	12.91	
3110610	0.3	1	45	0.5	4	0.55	14.16	1.06	1.12	1.19	1.27	1.35	1.45	
3110615	0.3	1.5	45	0.5	4	0.55	13.33	1.6	1.7	1.81	1.92	2.04	2.17	
3120615	0.3	1.5	50	0.5	6	0.55	13.85	1.6	1.7	1.81	1.92	2.04	2.17	
3110620	0.3	2	45	0.5	4	0.55	12.59	2.13	2.27	2.41	2.56	2.71	2.86	
3120620	0.3	2	50	0.5	6	0.55	13.32	2.13	2.27	2.41	2.56	2.71	2.86	
3110625	0.3	2.5	45	0.5	4	0.55	11.93	2.67	2.84	3.01	3.18	3.35	3.52	
3120625	0.3	2.5	50	0.5	6	0.55	12.82	2.67	2.84	3.01	3.18	3.35	3.52	
3110630	0.3	3	45	0.5	4	0.55	11.33	3.21	3.41	3.6	3.79	3.98	4.17	
3120630	0.3	3	50	0.5	6	0.55	12.36	3.21	3.41	3.6	3.79	3.98	4.17	
3110635	0.3	3.5	45	0.5	4	0.55	10.79	3.74	3.97	4.19	4.4	4.61	4.81	
3110640	0.3	4	45	0.5	4	0.55	10.3	4.27	4.53	4.77	5	5.22	5.44	
3120640	0.3	4	50	0.5	6	0.55	11.53	4.27	4.53	4.77	5	5.22	5.44	
3110645	0.3	4.5	45	0.5	4	0.55	9.85	4.81	5.08	5.35	5.59	5.83	6.06	
3110650	0.3	5	45	0.5	4	0.55	9.44	5.34	5.64	5.92	6.18	6.43	6.67	
3120650	0.3	5	50	0.5	6	0.55	10.8	5.34	5.64	5.92	6.18	6.43	6.67	
3110655	0.3	5.5	45	0.5	4	0.55	9.06	5.87	6.19	6.49	6.77	7.03	7.28	
3110660	0.3	6	45	0.5	4	0.55	8.71	6.4	6.74	7.06	7.35	7.62	7.88	
3120660	0.3	6	50	0.5	6	0.55	10.16	6.4	6.74	7.06	7.35	7.62	7.88	
3110665	0.3	6.5	45	0.5	4	0.55	8.39	6.93	7.29	7.62	7.92	8.21	8.48	
3110670	0.3	7	45	0.5	4	0.55	8.08	7.46	7.84	8.19	8.5	8.79	9.07	
3110675	0.3	7.5	45	0.5	4	0.55	7.8	7.99	8.39	8.75	9.07	9.38	9.66	
3110680	0.3	8	45	0.5	4	0.55	7.54	8.51	8.94	9.31	9.64	9.95	10.25	
3120680	0.3	8	50	0.5	6	0.55	9.08	8.51	8.94	9.31	9.64	9.95	10.25	
3110685	0.3	8.5	45	0.5	4	0.55	7.3	9.04	9.48	9.86	10.21	10.53	10.83	
3110690	0.3	9	45	0.5	4	0.55	7.07	9.57	10.02	10.42	10.78	11.11	11.65	
3110695	0.3	9.5	45	0.5	4	0.55	6.85	10.1	10.57	10.967	11.34	11.68	12.27	
3110700	0.3	10	45	0.5	4	0.55	6.65	10.62	11.11	11.53	11.9	12.25	12.9	
3120700	0.3	10	50	0.5	6	0.55	8.2	10.62	11.11	11.53	11.9	12.25	12.9	
3110711	0.3	11	45	0.5	4	0.55	6.28	11.67	12.19	12.63	13.02	13.6	14.14	
3110712	0.3	12	45	0.5	4	0.55	5.94	12.72	13.27	13.73	14.14	14.79	15.38	
3110820	0.4	2	45	0.6	4	0.75	13.13	2.13	2.26	2.39	2.53	2.68	2.82	
3120820	0.4	2	50	0.6	6	0.75	13.71	2.13	2.26	2.39	2.53	2.68	2.82	
3110830	0.4	3	45	0.5	4	0.75	11.77	3.2	3.39	3.58	3.77	3.96	4.14	
3120830	0.4	3	50	0.6	6	0.75	12.7	3.2	3.39	3.58	3.77	3.96	4.14	
3110840	0.4	4	45	0.6	4	0.75	10.66	4.27	4.52	4.75	4.98	5.2	5.41	
3120840	0.4	4	50	0.6	6	0.75	11.83	4.27	4.52	4.75	4.98	5.2	5.41	
3110850	0.4	5	45	0.6	4	0.75	9.74	5.33	5.63	5.9	6.16	6.41	6.65	

WXL



## Ball nose end mills - Miniatur-Kopierfräser - Microfrese sferiche per nervature - Microfraises hémisphériques

WXL-LN-EBD



WXL



EDP	R	l1	L	l	d	d1	θ	α (Le)						€
								0.5°	1°	1.5°	2°	2.5°	3°	
3120850	0.4	5	50	0.6	6	0.75	11.06	5.33	5.63	5.9	6.16	6.41	6.65	
3110860	0.4	6	45	0.6	4	0.75	8.97	6.39	6.73	7.04	7.33	7.6	7.86	
3120860	0.4	6	50	0.6	6	0.75	10.39	6.39	6.73	7.04	7.33	7.6	7.86	
3110870	0.4	7	45	0.6	4	0.75	8.31	7.45	7.83	8.17	8.49	8.78	9.05	
3110880	0.4	8	45	0.6	4	0.75	7.74	8.51	8.93	9.29	9.63	9.94	10.23	
3120880	0.4	8	50	0.6	6	0.75	9.26	8.51	8.93	9.29	9.63	9.94	10.23	
3110890	0.4	9	45	0.6	4	0.75	7.24	9.56	10.02	10.41	10.76	11.09	11.4	
3110900	0.4	10	45	0.6	4	0.75	6.8	10.62	11.1	11.52	11.89	12.24	12.56	
3120900	0.4	10	50	0.6	6	0.75	8.35	10.62	11.1	11.52	11.89	12.24	12.56	
3110912	0.4	12	45	0.6	4	0.75	6.06	12.72	13.26	13.72	14.13	14.5	15.36	
3111025	0.5	2.5	45	0.8	4	0.95	12.94	2.66	2.81	2.97	3.13	3.3	3.46	
3111030	0.5	3	45	0.8	4	0.95	12.25	3.19	3.38	3.57	3.75	3.93	4.11	
3121030	0.5	3	50	0.8	6	0.95	13.06	3.19	3.38	3.57	3.75	3.93	4.11	
3111040	0.5	4	45	0.8	4	0.95	11.05	4.26	4.5	4.74	4.96	5.18	5.39	
3121040	0.5	4	50	0.8	6	0.95	12.14	4.26	4.5	4.74	4.96	5.18	5.39	
3111050	0.5	5	45	0.8	4	0.95	10.07	5.33	5.62	5.89	6.15	6.39	6.63	
3121050	0.5	5	50	0.8	6	0.95	11.34	5.33	5.62	5.89	6.15	6.39	6.63	
3111060	0.5	6	45	0.8	4	0.95	9.24	6.39	6.72	7.03	7.32	7.58	7.84	
3121060	0.5	6	50	0.8	6	0.95	10.63	6.39	6.72	7.03	7.32	7.58	7.84	
3111070	0.5	7	45	0.8	4	0.95	8.54	7.45	7.82	8.16	8.47	8.76	9.03	
3121070	0.5	7	50	0.8	6	0.95	10.01	7.45	7.82	8.16	8.47	8.76	9.03	
3111080	0.5	8	45	0.8	4	0.95	7.94	8.5	8.92	9.28	9.62	9.92	10.21	
3121080	0.5	8	50	0.8	6	0.95	9.45	8.5	8.92	9.28	9.62	9.92	10.21	
3111090	0.5	9	45	0.8	4	0.95	7.42	9.56	10.01	10.4	10.75	11.08	11.38	
3111100	0.5	10	45	0.8	4	0.95	6.96	10.61	11.09	11.51	11.88	12.22	12.54	
3121100	0.5	10	50	0.8	6	0.95	8.51	10.61	11.09	11.51	11.88	12.22	12.54	
3111112	0.5	12	45	0.8	4	0.95	6.19	12.71	13.25	13.71	14.12	14.49	14.83	
3121112	0.5	12	50	0.8	6	0.95	7.74	12.71	13.25	13.71	14.12	14.49	14.83	
3111114	0.5	14	50	0.8	4	0.95	5.57	14.81	15.4	15.9	16.34	16.73	17.82	
3121114	0.5	14	60	0.8	6	0.95	7.09	14.81	15.4	15.9	16.34	16.73	17.82	
3111116	0.5	16	50	0.8	4	0.95	5.07	16.9	17.54	18.07	18.54	19.53	20.31	
3121116	0.5	16	60	0.8	6	0.95	6.54	16.9	17.54	18.07	18.54	19.53	20.31	
3111118	0.5	18	55	0.8	4	0.95	4.65	18.99	19.67	20.23	20.73	21.92	22.79	
3111120	0.5	20	55	0.8	4	0.95	4.29	21.07	21.8	22.39	23.42	24.31	25.28	
3121120	0.5	20	60	0.8	6	0.95	5.67	21.07	21.8	22.39	23.42	24.31	25.28	
3111122	0.5	22	60	0.8	6	0.95	5.31	23.15	23.91	24.54	25.72	26.7	27.77	
3111240	0.6	4	45	1	4	1.15	11.47	4.25	4.49	4.72	4.94	5.16	5.36	
3111260	0.6	6	45	1	4	1.15	9.53	6.38	6.71	7.02	7.3	7.57	7.82	
3121260	0.6	6	50	1	6	1.15	10.88	6.38	6.71	7.02	7.3	7.57	7.82	
3111280	0.6	8	45	1	4	1.15	8.15	8.5	8.91	9.27	9.6	9.91	10.2	
3121280	0.6	8	50	1	6	1.15	9.65	8.5	8.91	9.27	9.6	9.91	10.2	
3111300	0.6	10	45	1	4	1.15	7.12	10.61	11.08	11.5	11.87	12.21	12.53	
3121300	0.6	10	50	1	6	1.15	8.67	10.61	11.08	11.5	11.87	12.21	12.53	
3111312	0.6	12	45	1	4	1.15	6.32	12.71	13.24	13.7	14.11	14.48	14.82	
3121312	0.6	12	50	1	6	1.15	7.87	12.71	13.24	13.7	14.11	14.48	14.82	
3111314	0.6	14	50	1	4	1.15	5.68	14.8	15.39	15.89	16.32	16.72	17.09	
3111316	0.6	16	50	1	4	1.15	5.16	16.89	17.53	18.06	18.53	18.95	20.28	
3121316	0.6	16	60	1	6	1.15	6.64	16.89	17.53	18.06	18.53	18.95	20.28	
3111318	0.6	18	55	1	4	1.15	4.72	18.98	19.66	20.23	20.72	21.9	22.77	
3111320	0.6	20	60	1	4	1.15	4.35	21.06	21.79	22.38	22.9	24.29	25.26	
3111324	0.6	24	60	1	4	1.15	3.77	25.22	26.02	26.67	28	29.07	30.23	
3111480	0.7	8	45	1.1	4	1.35	8.38	8.49	8.9	9.26	9.59	9.89	10.18	
3111512	0.7	12	45	1.1	4	1.35	6.46	12.7	13.24	13.69	14.09	14.46	14.81	
3111516	0.7	16	50	1.1	4	1.35	5.25	16.89	17.53	18.05	18.52	18.94	19.32	
3111530	0.75	3	45	1.2	4	1.45	13.61	3.17	3.35	3.52	3.7	3.87	4.04	
3111540	0.75	4	45	1.2	4	1.45	12.16	4.24	4.47	4.7	4.91	5.12	5.33	
3111560	0.75	6	45	1.2	4	1.45	10.01	6.37	6.7	7	7.28	7.54	7.79	
3121560	0.75	6	50	1.2	6	1.45	11.29	6.37	6.7	7	7.28	7.54	7.79	
3111580	0.75	8	45	1.2	4	1.45	8.5	8.49	8.89	9.25	9.58	9.89	10.17	
3121580	0.75	8	50	1.2	6	1.45	9.97	8.49	8.89	9.25	9.58	9.89	10.17	
3111600	0.75	10	45	1.2	4	1.45	7.38	10.6	11.07	11.48	11.85	12.19	12.5	
3121600	0.75	10	50	1.2	6	1.45	8.93	10.6	11.07	11.48	11.85	12.19	12.5	
3111612	0.75	12	45	1.2	4	1.45	6.53	12.7	13.23	13.69	14.09	14.46	14.8	
3121612	0.75	12	50	1.2	6	1.45	8.08	12.7	13.23	13.69	14.09	14.46	14.8	
3111614	0.75	14	50	1.2	4	1.45	5.85	14.8	15.38	15.87	16.31	16.7	17.07	
3111616	0.75	16	55	1.2	4	1.45	5.29	16.89	17.52	18.05	18.51	18.93	19.31	

## Ball nose end mills - Miniatur-Kopierfräser - Microfresa sferiche per nervature - Microfraises hémisphériques

WXL-LN-EBD



EDP	R	l1	L	l	d	d1	θ	α (Le)						€
								0.5°	1°	1.5°	2°	2.5°	3°	
3121616	0.75	16	60	1.2	6	1.45	6.79	16.89	17.52	18.05	18.51	18.93	19.31	
3111618	0.75	18	55	1.2	4	1.45	4.84	18.97	19.66	20.22	20.7	21.14	22.73	
3111620	0.75	20	55	1.2	4	1.45	4.45	21.06	21.78	22.37	22.88	23.34	25.22	
3121620	0.75	20	60	1.2	6	1.45	5.85	21.06	21.78	22.37	22.88	23.34	25.22	
3111622	0.75	22	55	1.2	4	1.45	4.12	23.14	23.9	24.52	25.05	26.65	27.71	
3111630	0.75	30	65	1.2	4	1.45	3.18	31.43	32.33	33.04	34.88	36.21	37.65	
3111640	0.8	4	45	1.3	4	1.55	12.41	4.24	4.47	4.69	4.9	5.11	5.31	
3111680	0.8	8	45	1.3	4	1.55	8.62	8.49	8.89	9.25	9.57	9.88	10.16	
3111712	0.8	12	45	1.3	4	1.55	6.6	12.7	13.23	13.68	14.08	14.45	14.79	
3111716	0.8	16	50	1.3	4	1.55	5.34	16.89	17.52	18.05	18.51	18.93	19.31	
3111720	0.8	20	55	1.3	4	1.55	4.48	21.06	21.78	22.37	22.88	23.33	25.61	
3111880	0.9	8	45	1.4	4	1.75	8.87	8.48	8.88	9.24	9.56	9.86	10.15	
3111912	0.9	12	45	1.4	4	1.75	6.74	12.69	13.22	13.67	14.07	14.44	14.78	
3111916	0.9	16	50	1.4	4	1.75	5.44	16.88	17.51	18.04	18.5	18.91	19.3	
3111920	0.9	20	55	1.4	4	1.75	4.55	21.05	21.77	22.36	22.87	23.33	23.74	
3112030	1	3	45	1.6	4	1.95	15.32	3.16	3.31	3.47	3.64	3.8	3.96	
3112040	1	4	45	1.6	4	1.95	13.51	4.23	4.44	4.66	4.86	5.06	5.26	
3122040	1	4	50	1.6	6	1.95	13.98	4.23	4.44	4.66	4.86	5.06	5.26	
3112060	1	6	45	1.6	4	1.95	10.91	6.36	6.67	6.96	7.23	7.49	7.74	
3122060	1	6	50	1.6	6	1.95	12.02	6.36	6.67	6.96	7.23	7.49	7.74	
3112080	1	8	45	1.6	4	1.95	9.14	8.48	8.87	9.22	9.55	9.85	10.13	
3122080	1	8	50	1.6	6	1.95	10.54	8.48	8.87	9.22	9.55	9.85	10.13	
3112100	1	10	45	1.6	4	1.95	7.87	10.59	11.05	11.45	11.82	12.15	12.47	
3122100	1	10	50	1.6	6	1.95	9.38	10.59	11.05	11.45	11.82	12.15	12.47	
3112112	1	12	45	1.6	4	1.95	6.9	12.69	13.21	13.66	14.06	14.43	14.76	
3122112	1	12	50	1.6	6	1.95	8.45	12.69	13.21	13.66	14.06	14.43	14.76	
3112114	1	14	50	1.6	4	1.95	6.14	14.79	15.36	15.85	16.28	16.67	17.04	
3112116	1	16	50	1.6	4	1.95	5.54	16.88	17.51	18.03	18.49	18.9	19.28	
3122116	1	16	60	1.6	6	1.95	7.05	16.88	17.51	18.03	18.49	18.9	19.28	
3112118	1	18	55	1.6	4	1.95	5.04	18.96	19.64	20.2	20.68	21.12	21.51	
3112120	1	20	55	1.6	4	1.95	4.62	21.05	21.77	22.35	22.86	23.32	23.73	
3122120	1	20	65	1.6	6	1.95	6.05	21.05	21.77	22.35	22.86	23.32	23.73	
3112122	1	22	60	1.6	4	1.95	4.27	23.13	23.89	24.5	25.03	25.5	25.93	
3112125	1	25	65	1.6	4	1.95	3.83	26.24	27.06	27.71	28.27	28.77	31.38	
3122125	1	25	70	1.6	6	1.95	5.13	26.24	27.06	27.71	28.27	28.77	31.38	
3112130	1	30	70	1.6	4	1.95	3.27	31.42	32.32	33.03	33.63	36.16	37.59	
3122130	1	30	75	1.6	6	1.95	4.46	31.42	32.32	33.03	33.63	36.16	37.59	
3112135	1	35	75	1.6	4	1.95	2.85	36.59	37.56	38.32	40.59	42.14	-	
3122135	1	35	80	1.6	6	1.95	3.94	36.59	37.56	38.32	40.59	42.14	43.81	
3112140	1	40	80	1.6	4	1.95	2.53	41.74	42.78	43.59	46.34	48.11	-	
3112560	1.25	6	45	2	4	2.35	12.23	6.26	6.52	6.76	6.99	7.21	7.43	
3112600	1.25	10	50	2	4	2.35	8.54	10.46	10.85	11.21	11.54	11.85	12.14	
3112615	1.25	15	55	2	4	2.35	6.19	15.67	16.21	16.68	17.09	17.47	17.83	
3112620	1.25	20	60	2	4	2.35	4.85	20.87	21.52	22.07	22.55	22.99	23.39	
3112625	1.25	25	65	2	4	2.35	3.99	26.05	26.8	27.42	27.95	28.53	28.87	
3112630	1.25	30	70	2	4	2.35	3.38	31.21	32.05	32.73	33.31	33.83	37.3	
3112635	1.25	35	70	2	4	2.35	2.94	36.37	37.28	38.01	38.64	41.86	-	
3123059	1.5	6	45	2.4	3	2.85	13.17	6.25	6.49	6.72	6.95	7.17	7.38	
3113060	1.5	6	45	2.4	4	2.85	13.6	6.25	6.49	6.72	6.95	7.17	7.38	
3123060	1.5	6	50	2.4	6	2.85	14.04	6.25	6.49	6.72	6.95	7.17	7.38	
3123080	1.5	8	50	2.4	6	2.85	12.07	8.35	8.67	8.97	9.25	9.51	9.77	
3123100	1.5	10	50	2.4	6	2.85	10.58	10.45	10.83	11.19	11.51	11.81	12.1	
3123112	1.5	12	55	2.4	6	2.85	9.41	12.54	12.99	13.38	13.75	14.08	14.4	
3123114	1.5	14	55	2.4	6	2.85	8.48	14.62	15.13	15.57	15.96	16.33	16.67	
3123115	1.5	15	55	2.4	6	2.85	8.08	15.66	16.19	16.65	17.07	17.44	17.8	
3123116	1.5	16	55	2.4	6	2.85	7.71	16.7	17.26	17.74	18.17	18.56	18.92	
3123120	1.5	20	60	2.4	6	2.85	6.53	20.86	21.51	22.05	22.53	22.96	23.36	
3123125	1.5	25	65	2.4	6	2.85	5.47	26.04	26.78	27.4	27.94	28.41	28.85	
3123130	1.5	30	70	2.4	6	2.85	4.71	31.2	32.04	32.71	33.3	33.81	34.27	
3123135	1.5	35	80	2.4	6	2.85	4.14	36.36	37.27	38	38.62	39.16	43.45	
3123140	1.5	40	85	2.4	6	2.85	3.69	41.51	42.49	43.26	43.92	47.79	49.67	
3123600	1.75	10	60	2.8	6	3.35	11.23	10.44	10.82	11.16	11.48	11.78	12.06	
3123615	1.75	15	60	2.8	6	3.35	8.45	15.65	16.18	16.63	17.04	17.42	17.76	
3123620	1.75	20	65	2.8	6	3.35	6.77	20.85	21.49	22.03	22.51	22.94	23.34	
3123625	1.75	25	65	2.8	6	3.35	5.64	26.03	26.77	27.38	27.92	28.39	28.82	
3123630	1.75	30	70	2.8	6	3.35	4.84	31.2	32.03	32.7	33.28	33.79	34.25	

WXL



## Ball nose end mills - Miniatur-Kopierfräser - Microfresa sferiche per nervature - Microfraises hémisphériques

WXL-LN-EBD



EDP	R	l1	L	l	d	d1	θ	α (Le)						€
								0.5°	1°	1.5°	2°	2.5°	3°	
3123635	1.75	35	80	2.8	6	3.35	4.23	36.35	37.26	37.99	38.61	39.15	39.63	
3123640	1.75	40	90	2.8	6	3.35	3.76	41.5	42.48	43.25	43.91	44.47	49.61	
3123645	1.75	45	90	2.8	6	3.35	3.39	46.64	47.68	48.5	49.18	53.71	55.82	
3114080	2	8	55	3.2	4	3.85	13.38	8.33	8.63	8.91	9.18	9.43	9.68	
3124080	2	8	60	3.2	6	3.85	13.89	8.33	8.63	8.91	9.18	9.43	9.68	
3124100	2	10	60	3.2	6	3.85	11.96	10.42	10.8	11.13	11.475	11.74	12.02	
3124112	2	12	60	3.2	6	3.85	10.49	12.51	12.95	13.34	13.69	14.02	14.33	
3124114	2	14	60	3.2	6	3.85	9.35	14.6	15.09	15.52	15.91	16.27	16.61	
3124115	2	15	60	3.2	6	3.85	8.86	15.64	16.16	16.61	17.02	17.39	17.73	
3124116	2	16	60	3.2	6	3.85	8.42	16.68	17.23	17.7	18.12	18.5	18.86	
3124120	2	20	65	3.2	6	3.85	7.03	20.84	21.48	22.01	22.49	22.92	23.31	
3124125	2	25	70	3.2	6	3.85	5.82	26.02	26.76	27.37	27.9	28.37	28.8	
3124130	2	30	80	3.2	6	3.85	4.97	31.19	32.01	32.68	33.26	33.77	34.23	
3124135	2	35	80	3.2	6	3.85	4.33	36.34	37.25	37.97	38.59	39.13	39.62	
3124140	2	40	90	3.2	6	3.85	3.84	41.49	42.47	43.24	43.89	44.46	44.96	
3124145	2	45	90	3.2	6	3.85	3.45	46.63	47.67	48.49	49.17	49.76	55.77	
3124150	2	50	100	3.2	6	3.85	3.13	51.76	52.86	53.72	54.43	59.64	61.98	
3125100	2.5	10	65	5	6	4.85	13.74	10.4	10.76	11.08	11.38	11.67	11.94	
3125115	2.5	15	70	5	6	4.85	9.81	15.62	16.13	16.57	16.97	17.33	17.67	
3125120	2.5	20	70	5	6	4.85	7.62	20.82	21.45	21.98	22.45	22.87	23.26	
3125125	2.5	25	70	5	6	4.85	6.22	26	26.73	27.33	27.86	28.33	28.76	
3125130	2.5	30	80	5	6	4.85	5.26	31.17	31.99	32.65	33.23	33.73	34.19	
3125135	2.5	35	80	5	6	4.85	4.55	36.33	37.23	37.95	38.56	39.1	39.58	
3125140	2.5	40	90	5	6	4.85	4.01	41.48	42.44	43.21	43.86	44.43	44.93	
3125145	2.5	45	100	5	6	4.85	3.59	46.62	47.65	48.46	49.14	49.73	50.25	
3125150	2.5	50	100	5	6	4.85	3.24	51.75	52.84	53.69	54.4	55.01	55.54	
3126100	3	10	60	6	6	5.85	16.14	10.38	10.71	11.03	11.32	11.6	11.86	
3126120	3	20	70	6	6	5.85	8.31	20.8	21.42	21.94	22.4	22.82	23.21	
3126125	3	25	70	6	6	5.85	6.68	25.99	26.7	27.3	27.82	28.29	28.71	
3126130	3	30	80	6	6	5.85	5.58	31.16	31.96	32.62	33.19	33.7	34.15	
3126135	3	35	80	6	6	5.85	4.79	36.31	37.2	37.92	38.53	39.06	39.54	
3126140	3	40	90	6	6	5.85	4.2	41.46	42.42	43.19	43.83	44.4	44.9	
3126145	3	45	100	6	6	5.85	3.73	46.6	47.63	48.44	49.12	49.7	50.22	
3126150	3	50	120	6	6	5.85	3.36	51.74	52.82	53.67	54.38	54.98	55.51	

WXL



WXL-LN-EBD	Applications - Anwendungen - Applicazioni - Applications												
	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
	⊙	⊙	⊙			⊙	⊙	⊙	○		○	○	

Multiflute end mills - Mehrschneider - Fresa multidenti - Fraises multilèvres

**NEW**

- \* HIGH PERFORMANCE
- \* Multipurpose
- \* Vibration-resistant

**NEU**

- \* HIGH PERFORMANCE
- \* Allgemeine Anwendungen
- \* Anti-vibration

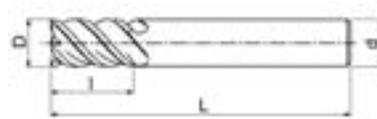
**NUOVO**

- \* ALTA PERFORMANCE
- \* Multifunzione
- \* Resistente alle vibrazioni

**NOUVEAU**

- \* HAUTE PERFORMANCE
- \* Multi-fonction
- \* Résistante aux vibrations

**UP-PHS**

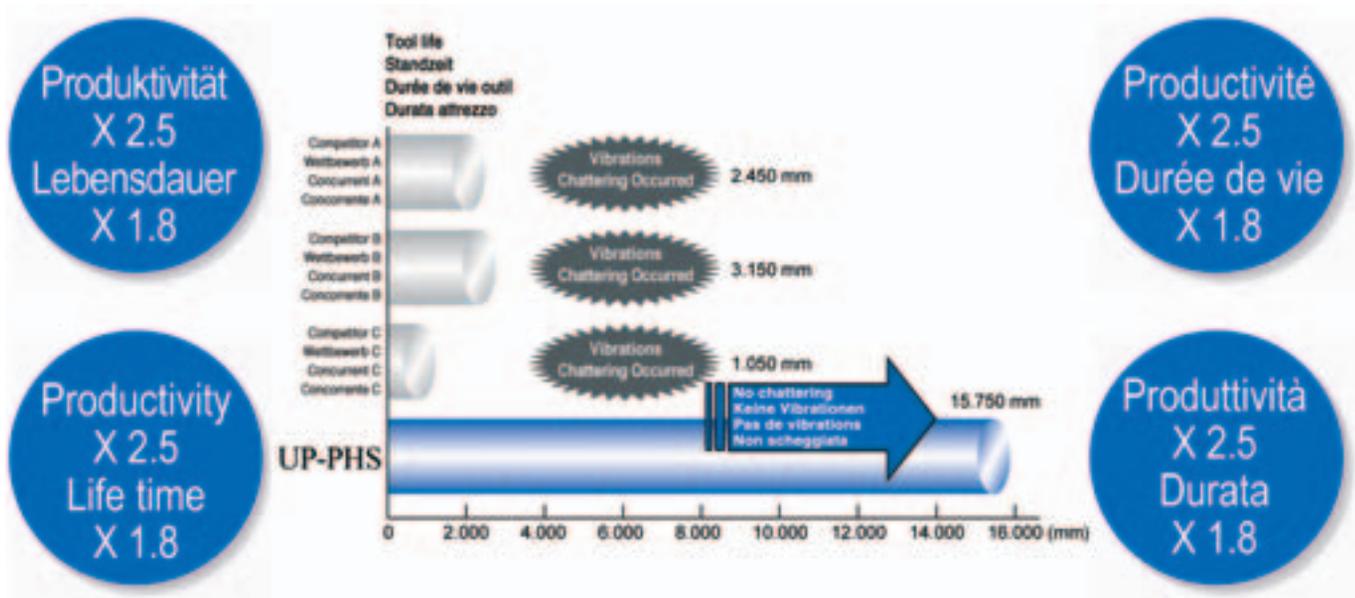


0~-0.02

P. 89

EDP	D	L	I	d	€
8529030	3	60	8	6	
8529040	4	60	11	6	
8529050	5	60	13	6	
8529060	6	60	13	6	
8529080	8	80	19	8	
8529100	10	80	22	10	
8529120	12	100	26	12	

**UP**



OSG Europe : www.osgeurope.com

	Applications		Anwendungen			Applicazioni		Applications					
<b>UP-PHS</b>	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
	⊙	⊙	○			⊙	⊙	○	○		⊙	○	

## Multiflute end mills - Mehrschneider - Fresa multidenti - Fraises multilèbres

**NEW**

\* HIGH PERFORMANCE

**NEU**

\* HIGH PERFORMANCE

**NUOVO**

\* ALTA PERFORMANCE

**NOUVEAU**

\* HAUTE PERFORMANCE

**WXS-EMS**

0~-0.02

P. 90



EDP	D	L	l	d	n <sub>Δ</sub>	€
3041010	1	60	2.5	6	4	
3041015	1.5	60	4	6	4	
3041020	2	60	6	6	4	
3041025	2.5	60	8	6	4	
3041030	3	60	8	6	4	
3041035	3.5	60	10	6	4	
3041040	4	60	11	6	4	
3041045	4.5	60	11	6	4	
3041050	5	60	13	6	4	
3041055	5.5	60	13	6	4	
3041060	6	60	13	6	6	
3041080	8	70	19	8	6	
3041100	10	80	22	10	6	
3041120	12	90	26	12	6	

Δ number of flutes - Anzahl Schneiden - numero di denti - nombre de lèvres

**WXS**

WXS-EMS	Applications - Anwendungen - Applicazioni - Applications												
	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
	⊙	⊙	⊙	⊙	○	○	⊙				○	○	

Ball nose end mills - Kopierfräser - Frese sferiche - Fraises hémisphériques

**NEW**

\* HIGH PERFORMANCE

**NEU**

\* HIGH PERFORMANCE

**NUOVO**

\* ALTA PERFORMANCE

**NOUVEAU**

\* HAUTE PERFORMANCE

**WXS-HS-EBD**



R ≤ 1    1 < R ≤ 6    P. 91



EDP	R	D	l1	L	l	d1	d	€
3041710	0.5	1	2	40	1	0.95	4	
3041720	1	2	4	40	2	1.95	6	
3041730	1.5	3	6	50	3	2.85	6	
3041740	2	4	8	50	4	3.85	6	
3041750	2.5	5	10	50	5	4.85	6	
3041760	3	6	-	50	9	-	6	
3041780	4	8	-	60	12	-	8	
3041800	5	10	-	70	15	-	10	
3041820	6	12	-	80	18	-	12	

**NEW**

\* HIGH PERFORMANCE

**NEU**

\* HIGH PERFORMANCE

**NUOVO**

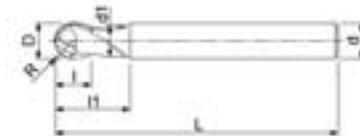
\* ALTA PERFORMANCE

**NOUVEAU**

\* HAUTE PERFORMANCE

**WXS-EBD**

**WXS**



R ≤ 1    1 < R ≤ 6    6 < R    P. 91



EDP	R	D	l1	L	l	d1	d	€
3041410	0.5	1	2	50	1	0.95	4	
3041415	0.75	1.5	3	50	1.5	1.45	4	
3041420	1	2	4	50	2	1.95	6	
3041430	1.5	3	6	60	3	2.85	6	
3041440	2	4	8	70	4	3.85	6	
3041441	2	4	8	60	4	3.85	4	
3041450	2.5	5	10	80	5	4.85	6	
3041460	3	6	-	90	9	-	6	
3041480	4	8	-	100	12	-	8	
3041500	5	10	-	100	15	-	10	
3041520	6	12	-	110	18	-	12	

OSG Europe : www.osgeurope.com

	Applications		Anwendungen		Applicazioni		Applications						
<b>WXS-HS-EBD</b>	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
	⊙	⊙	⊙	⊙	○	⊙	⊙				○	○	
<b>WXS-EBD</b>	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
	⊙	⊙	⊙	⊙	○	⊙	⊙				○	○	

Ball nose end mills - Miniatur-Kopierfräser - Microfresa sferiche per nervature - Microfraises hémisphériques

**\* NEW**

**\* HIGH PERFORMANCE**

**\* NEU**

**\* HIGH PERFORMANCE**

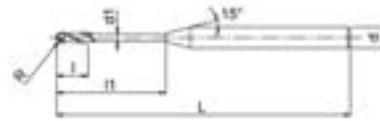
**\* NUOVO**

**\* ALTA PERFORMANCE**

**\* NOUVEAU**

**\* HAUTE PERFORMANCE**

**WXS-LN-EBD**



P. 92-95



**WXS**



EDP	R	l1	L	l	d1	d	α (Le)						€	
							0.5°	1°	1.5°	2°	2.5°	3°		
3050100	*	0.05	0.3	45	0.08	0.09	4	0.33	0.37	0.41	0.46	0.52	0.59	
3050101	*	0.05	0.5	45	0.08	0.09	4	0.55	0.61	0.67	0.75	0.83	0.92	
3050201	*	0.1	0.5	45	0.16	0.18	4	0.55	0.6	0.66	0.73	0.81	0.9	
3049921	*	0.1	0.75	45	0.16	0.18	4	0.82	0.9	0.98	1.08	1.18	1.29	
3050202	*	0.1	1	45	0.16	0.18	4	1.09	1.19	1.3	1.41	1.53	1.66	
3049922	*	0.1	1.25	45	0.16	0.18	4	1.36	1.48	1.61	1.74	1.88	2.02	
3050203	*	0.1	1.5	45	0.16	0.18	4	1.64	1.78	1.92	2.07	2.22	2.37	
3049923	*	0.1	1.75	45	0.16	0.18	4	1.91	2.07	2.23	2.39	2.55	2.71	
3050204	*	0.1	2	46	0.16	0.18	4	2.18	2.35	2.53	2.7	2.88	3.05	
3050205	*	0.1	2.5	45	0.16	0.18	4	2.72	2.93	3.13	3.33	3.52	3.71	
3050206	*	0.1	3	45	0.16	0.18	4	3.26	3.49	3.72	3.94	4.15	4.36	
3050301	*	0.15	0.6	45	0.16	0.16	4	0.66	0.72	0.79	0.87	0.96	1.05	
3050302	*	0.15	1	45	0.24	0.28	4	1.09	1.19	1.3	1.41	1.53	1.66	
3049932	*	0.15	1.25	45	0.24	0.28	4	1.36	1.48	1.61	1.74	1.88	2.02	
3050303	*	0.15	1.5	45	0.24	0.28	4	1.64	1.78	1.92	2.07	2.22	2.37	
3049933	*	0.15	1.75	45	0.24	0.28	4	1.91	2.07	2.23	2.39	2.55	2.71	
3050304	*	0.15	2	45	0.24	0.28	4	2.18	2.35	2.53	2.7	2.88	3.05	
3049934	*	0.15	2.25	45	0.24	0.28	4	2.45	2.64	2.83	3.02	3.2	3.38	
3050305	*	0.15	2.5	45	0.24	0.28	4	2.72	2.93	3.13	3.33	3.52	3.71	
3050306	*	0.15	3	45	0.24	0.28	4	3.26	3.49	3.72	3.94	4.15	4.36	
3050307	*	0.15	3.5	45	0.24	0.28	4	3.79	4.06	4.31	4.54	4.77	4.99	
3050308	*	0.15	4	45	0.24	0.28	4	4.33	4.62	4.89	5.14	5.38	5.61	
3050309	*	0.15	4.5	45	0.24	0.28	4	4.86	5.18	5.47	5.74	5.99	6.24	
3050310	*	0.15	5	45	0.24	0.28	4	5.4	5.74	6.04	6.32	6.59	6.86	
3050401	*	0.2	0.8	45	0.3	0.37	4	0.87	0.95	1.03	1.13	1.23	1.34	
3050402	*	0.2	1	45	0.3	0.37	4	1.09	1.18	1.29	1.39	1.51	1.63	
3050403	*	0.2	1.5	45	0.3	0.37	4	1.63	1.76	1.9	2.04	2.19	2.34	
3050404	*	0.2	2	45	0.3	0.37	4	2.17	2.34	2.51	2.68	2.85	3.01	
3050405	*	0.2	2.5	45	0.3	0.37	4	2.71	2.91	3.11	3.3	3.49	3.67	
3050406	*	0.2	3	45	0.3	0.37	4	3.24	3.48	3.7	3.91	4.12	4.32	
3050407	*	0.2	3.5	45	0.3	0.37	4	3.78	4.04	4.28	4.51	4.74	4.95	
3050408	*	0.2	4	45	0.3	0.37	4	4.32	4.6	4.86	5.11	5.35	5.58	
3050409	*	0.2	4.5	45	0.3	0.37	4	4.85	5.16	5.44	5.7	5.95	6.2	
3050410	*	0.2	5	45	0.3	0.37	4	5.38	5.71	6.01	6.29	6.55	6.82	
3050411	*	0.2	5.5	45	0.3	0.37	4	5.91	6.27	6.58	6.87	7.15	7.44	
3050412	*	0.2	6	45	0.3	0.37	4	6.45	6.82	7.15	7.46	7.75	8.06	
3050500	*	0.25	1	45	0.4	0.45	4	1.08	1.17	1.26	1.36	1.47	1.58	
3050501	*	0.25	1.5	45	0.4	0.45	4	1.62	1.74	1.87	2	2.14	2.28	
3050502	*	0.25	2	45	0.4	0.45	4	2.16	2.31	2.47	2.63	2.79	2.96	
3049952	*	0.25	2.5	45	0.4	0.45	4	2.69	2.88	3.07	3.25	3.43	3.61	
3050503	*	0.25	3	45	0.4	0.45	4	3.23	3.44	3.65	3.86	4.06	4.25	
3049953	*	0.25	3.5	45	0.4	0.45	4	3.76	4	4.24	4.46	4.67	4.88	
3050504	*	0.25	4	45	0.4	0.45	4	4.29	4.56	4.81	5.05	5.28	5.51	
3049954	*	0.25	4.5	45	0.4	0.45	4	4.83	5.12	5.39	5.65	5.89	6.13	
3050505	*	0.25	5	45	0.4	0.45	4	5.36	5.67	5.96	6.23	6.49	6.75	
3049955	*	0.25	5.5	45	0.4	0.45	4	5.89	6.22	6.53	6.81	7.09	7.37	
3050506	*	0.25	6	45	0.4	0.45	4	6.42	6.77	7.1	7.39	7.68	7.99	
3050507	*	0.25	7	45	0.4	0.45	4	7.48	7.87	8.22	8.54	8.88	9.24	

## Ball nose end mills - Miniatur-Kopierfräser - Microfrese sferiche per nervature - Microfraises hémisphériques

WXS-LN-EBD

EDP	R	l1	L	l	d1	d	$\alpha$ (Le)						€
							0.5°	1°	1.5°	2°	2.5°	3°	
3050508 *	0.25	8	45	0.4	0.45	4	8.53	8.96	9.34	9.69	10.07	10.48	
3050509 *	0.25	9	45	0.4	0.45	4	9.59	10.05	10.45	10.84	11.27	11.72	
3050510 *	0.25	10	45	0.4	0.45	4	10.64	11.13	11.56	11.99	12.46	12.97	
3050601 *	0.3	1.2	45	0.5	0.55	4	1.3	1.4	1.51	1.62	1.74	1.86	
3050602	0.3	2	45	0.5	0.55	4	2.16	2.31	2.47	2.63	2.79	2.96	
3049962 *	0.3	2.5	45	0.5	0.55	4	2.69	2.88	3.07	3.25	3.43	3.61	
3050603	0.3	3	45	0.5	0.55	4	3.23	3.44	3.65	3.86	4.06	4.25	
3049963 *	0.3	3.5	45	0.5	0.55	4	3.76	4	4.24	4.46	4.67	4.88	
3050604	0.3	4	45	0.5	0.55	4	4.29	4.56	4.81	5.06	5.28	5.51	
3049964 *	0.3	4.5	45	0.5	0.55	4	4.83	5.12	5.39	5.65	5.89	6.13	
3050605	0.3	5	45	0.5	0.55	4	5.36	5.67	5.96	6.23	6.49	6.75	
3049965 *	0.3	5.5	45	0.5	0.55	4	5.89	6.22	6.53	6.81	7.09	7.37	
3050606	0.3	6	45	0.5	0.55	4	6.42	6.77	7.1	7.39	7.68	7.99	
3049966 *	0.3	6.5	45	0.5	0.55	4	6.95	7.32	7.66	7.97	8.28	8.62	
6050607 *	0.3	7	45	0.5	0.55	4	7.48	7.87	8.22	8.54	8.88	9.24	
3049967 *	0.3	7.5	45	0.5	0.55	4	8	8.42	8.78	9.12	9.47	9.86	
3050608	0.3	8	45	0.5	0.55	4	5.53	8.96	9.34	9.69	10.07	10.48	
3049968 *	0.3	8.5	45	0.5	0.55	4	9.06	9.51	9.9	10.27	10.67	11.1	
3050609 *	0.3	9	45	0.5	0.55	4	9.59	10.05	10.45	10.84	11.27	11.72	
3049969 *	0.3	9.5	45	0.5	0.55	4	10.11	10.59	11.01	11.42	11.86	12.35	
3050610 *	0.3	10	45	0.5	0.55	4	10.64	11.13	11.56	11.99	12.46	12.97	
3050611 *	0.3	11	50	0.5	0.55	4	11.69	12.21	12.67	13.14	13.66	14.21	
3050612 *	0.3	12	50	0.5	0.55	4	12.74	13.29	13.78	14.29	14.85	15.45	
3050802	0.4	2	45	0.6	0.75	4	2.16	2.31	2.47	2.63	2.79	2.96	
3050803 *	0.4	3	45	0.6	0.75	4	3.23	3.44	3.65	3.86	4.06	4.25	
3050804	0.4	4	45	0.6	0.75	4	4.29	4.56	4.81	5.06	5.28	5.51	
3050805 *	0.4	5	45	0.6	0.75	4	5.36	5.67	5.96	6.23	6.49	6.75	
3050806	0.4	6	45	0.6	0.75	4	6.42	6.77	7.1	7.39	7.68	7.99	
3050807 *	0.4	7	45	0.6	0.75	4	7.48	7.87	8.22	8.54	8.88	9.24	
3050808	0.4	8	45	0.6	0.75	4	8.53	8.96	9.34	9.69	10.07	10.48	
3050810	0.4	10	45	0.6	0.75	4	10.64	11.13	11.56	11.99	12.46	12.97	
3050812 *	0.4	12	50	0.6	0.75	4	12.74	13.29	13.78	14.29	14.85	15.45	
3051002 *	0.5	2	45	0.8	0.95	4	2.16	2.31	2.47	2.63	2.79	2.96	
3051003	0.5	3	45	0.8	0.95	4	3.23	3.44	3.65	3.86	4.06	4.25	
3051004	0.5	4	45	0.8	0.95	4	4.29	4.56	4.81	5.06	5.28	5.51	
3051005	0.5	5	45	0.8	0.95	4	5.36	5.67	5.96	6.23	6.49	6.75	
3051006	0.5	6	45	0.8	0.95	4	6.42	6.77	7.1	7.39	7.68	7.99	
3051007	0.5	7	45	0.8	0.95	4	7.48	7.87	8.22	8.54	8.88	9.24	
3051008	0.5	8	45	0.8	0.95	4	8.53	8.96	9.34	9.69	10.07	10.48	
3051009	0.5	9	45	0.8	0.95	4	9.59	10.05	10.45	10.84	11.27	11.72	
3051010	0.5	10	45	0.8	0.95	4	10.64	11.13	11.56	11.99	12.46	12.97	
3051012	0.5	12	45	0.8	0.95	4	12.74	13.29	13.78	14.29	14.85	15.45	
3051014	0.5	14	50	0.8	0.95	4	14.83	15.44	15.99	16.59	17.24	17.94	
3051016	0.5	16	50	0.8	0.95	4	16.92	17.58	18.21	18.89	19.63	20.43	
3051018 *	0.5	18	55	0.8	0.95	4	19.01	19.71	20.43	21.19	22.02	22.91	
3051020	0.5	20	55	0.8	0.95	4	21.09	21.85	22.64	23.49	24.41	-	
3051022 *	0.5	22	60	0.8	0.95	4	23.17	23.99	24.86	25.79	26.8	27.88	
3051202 *	0.6	2.4	45	1	1.15	4	2.58	2.77	2.95	3.13	3.3	3.48	
3051204 *	0.6	4	45	1	1.15	4	4.29	4.56	4.81	5.05	5.28	5.51	
3051206	0.6	6	45	1	1.15	4	6.42	6.77	7.1	7.39	7.68	7.99	
3051208 *	0.6	8	45	1	1.15	4	8.53	8.96	9.34	9.69	10.07	10.48	
3051210 *	0.6	10	45	1	1.15	4	10.64	11.13	11.56	11.99	12.46	12.97	
3051212	0.6	12	45	1	1.15	4	12.74	13.29	13.78	14.29	14.85	15.45	
3051214 *	0.6	14	50	1	1.15	4	14.83	15.44	15.99	16.59	17.24	17.94	
3051216 *	0.6	16	50	1	1.15	4	16.92	17.58	18.21	18.89	19.63	20.43	
3051218 *	0.6	18	55	1	1.15	4	19.01	19.71	20.43	21.19	22.02	22.91	
3051220 *	0.6	20	55	1	1.15	4	21.09	21.85	22.64	23.49	24.41	25.4	
3051503 *	0.75	3	45	1.2	1.45	4	3.23	3.44	3.65	3.86	4.06	4.25	
3051504 *	0.75	4	45	1.2	1.45	4	4.29	4.56	4.81	5.05	5.28	5.51	
3051506 *	0.75	6	45	1.2	1.45	4	6.42	6.77	7.1	7.39	7.68	7.99	
3051508	0.75	8	45	1.2	1.45	4	8.53	8.96	9.34	9.69	10.07	10.48	
3051510 *	0.75	10	45	1.2	1.45	4	10.64	11.13	11.56	11.99	12.46	12.97	



WXS



## Ball nose end mills - Miniatur-Kopierfräser - Microfrese sferiche per nervature - Microfraises hémisphériques

WXS-LN-EBD



WXS



EDP	R	l1	L	l	d1	d	$\alpha$ (Le)						€
							0.5°	1°	1.5°	2°	2.5°	3°	
3051512	0.75	12	45	1.2	1.45	4	12.74	13.29	13.78	14.29	14.85	15.45	
3051514 *	0.75	14	50	1.2	1.45	4	14.83	15.44	15.99	16.59	17.24	17.94	
3051516	0.75	16	45	1.2	1.45	4	16.92	17.58	18.21	18.89	19.63	20.43	
3051518 *	0.75	18	55	1.2	1.45	4	19.01	19.71	20.43	21.19	22.02	22.91	
3051520	0.75	20	50	1.2	1.45	4	21.09	21.85	22.64	23.49	24.41	-	
3051522 *	0.75	22	60	1.2	1.45	4	23.17	23.99	24.86	25.79	26.8	-	
3051530 *	0.75	30	70	1.2	1.45	4	31.46	32.55	33.73	34.99	-	-	
3051608 *	0.8	8	45	1.3	1.55	4	8.53	8.96	9.34	9.69	10.07	10.48	
3051612 *	0.8	12	45	1.3	1.55	4	12.74	13.29	13.78	14.29	14.85	15.45	
3051616 *	0.8	16	50	1.3	1.55	4	16.92	17.58	18.21	18.89	19.63	20.43	
3051620 *	0.8	20	55	1.3	1.55	4	21.09	21.85	22.64	23.49	24.41	-	
3052004	1	4	45	1.6	1.95	4	4.29	4.56	4.81	5.06	5.28	5.51	
3052006	1	6	45	1.6	1.95	4	6.42	6.77	7.1	7.39	7.68	7.99	
3052008	1	8	45	1.6	1.95	4	8.53	8.96	9.34	9.69	10.07	10.48	
3052010	1	10	45	1.6	1.95	4	10.64	11.13	11.56	11.99	12.46	12.97	
3052012	1	12	45	1.6	1.95	4	12.74	13.29	13.78	14.29	14.85	15.45	
3052014	1	14	50	1.6	1.95	4	14.83	15.44	15.99	16.59	17.24	17.94	
3052016	1	16	50	1.6	1.95	4	16.92	17.58	18.21	18.89	19.63	20.43	
3052018	1	18	55	1.6	1.95	4	19.01	19.71	20.43	21.19	22.02	22.91	
3052020	1	20	55	1.6	1.95	4	21.09	21.85	22.64	23.49	-	-	
3052022 *	1	22	60	1.6	1.95	4	23.17	23.99	24.86	25.79	-	-	
3052025	1	25	65	1.6	1.95	4	26.28	27.2	28.19	-	-	-	
3052030	1	30	70	1.6	1.95	4	31.46	32.55	33.73	-	-	-	
3052035 *	1	35	70	1.6	1.95	4	36.62	37.9	-	-	-	-	
3052040 *	1	40	80	1.6	1.95	4	41.79	43.25	-	-	-	-	
3052510 *	1.25	10	45	2	2.35	4	10.51	10.95	11.35	11.77	12.23	12.73	
3052515 *	1.25	15	50	2	2.35	4	15.72	16.3	16.89	17.52	-	-	
3052520 *	1.25	20	55	2	2.35	4	20.91	21.65	22.43	-	-	-	
3052525 *	1.25	25	65	2	2.35	4	26.09	27	27.97	-	-	-	
3052530 *	1.25	30	70	2	2.35	4	31.26	32.35	-	-	-	-	
3052535 *	1.25	35	70	2	2.35	4	36.43	37.69	-	-	-	-	
3053006 *	1.5	6	50	2.4	2.85	6	6.33	6.63	6.91	7.17	7.45	7.76	
3053008	1.5	8	50	2.4	2.85	6	8.42	8.79	9.13	9.74	9.84	10.24	
3053010	1.5	10	50	2.4	2.85	6	10.51	10.95	11.35	11.77	12.23	12.73	
3053012 *	1.5	12	55	2.4	2.85	6	12.6	13.09	13.56	14.07	14.62	15.21	
3053014 *	1.5	14	55	2.4	2.85	6	14.68	15.23	15.78	16.37	17.01	17.7	
3053015 *	1.5	15	55	2.4	2.85	6	15.72	16.3	16.89	17.52	18.21	18.94	
3053016	1.5	16	55	2.4	2.85	6	16.76	17.37	18	18.67	19.4	20.19	
3053020	1.5	20	60	2.4	2.85	6	20.91	21.65	22.43	23.27	24.18	25.16	
3053025	1.5	25	65	2.4	2.85	6	26.09	27	27.97	29.02	30.15	-	
3053030	1.5	30	70	2.4	2.85	6	31.26	32.35	33.51	34.77	-	-	
3053035 *	1.5	35	80	2.4	2.85	6	36.43	37.69	39.06	40.52	-	-	
3053040 *	1.5	40	90	2.4	2.85	6	41.59	43.04	44.6	-	-	-	
3053515 *	1.75	15	55	2.8	3.35	6	15.72	16.3	16.89	17.52	18.21	18.94	
3053520 *	1.75	20	60	2.8	3.35	6	20.91	21.65	22.43	23.27	24.18	-	
3053525 *	1.75	25	65	2.8	3.35	6	26.09	27	27.97	29.02	-	-	
3053530 *	1.75	30	70	2.8	3.35	6	31.26	32.35	33.51	34.77	-	-	
3053535 *	1.75	35	80	2.8	3.35	6	36.43	37.69	39.06	-	-	-	
3053540 *	1.75	40	90	2.8	3.35	6	41.59	43.04	44.6	-	-	-	
3053545 *	1.75	45	90	2.8	3.35	6	46.76	48.39	-	-	-	-	
3054008 *	2	8	55	3.2	3.85	6	12.6	13.09	13.56	14.07	14.62	15.21	
3054010	2	10	60	3.2	3.85	6	10.51	10.95	11.35	11.77	12.23	12.73	
3054012 *	2	12	60	3.2	3.85	6	12.6	13.09	13.56	14.07	14.62	15.21	
3054015 *	2	15	60	3.2	3.85	6	15.72	16.3	16.89	17.52	18.21	18.94	
3054016	2	16	60	3.2	3.85	6	16.76	17.37	18	18.67	19.4	-	
3054020	2	20	65	3.2	3.85	6	20.91	21.65	22.43	23.27	-	-	
3054025	2	25	70	3.2	3.85	6	26.09	27	27.97	-	-	-	
3054030	2	30	80	3.2	3.85	6	31.26	32.35	33.51	-	-	-	
3054035	2	35	80	3.2	3.85	6	36.43	37.69	-	-	-	-	
3054040	2	40	90	3.2	3.85	6	41.59	43.04	-	-	-	-	
3054045 *	2	45	90	3.2	3.85	6	46.76	48.39	-	-	-	-	
3054050 *	2	50	100	3.2	3.85	6	51.93	53.74	-	-	-	-	

## Ball nose end mills - Miniatur-Kopierfräser - Microfresa sferiche per nervature - Microfraises hémisphériques

WXS-LN-EBD

EDP	R	l1	L	l	d1	d	$\alpha$ (Le)						€
							0.5°	1°	1.5°	2°	2.5°	3°	
3055010 *	2.5	10	60	4	4.85	6	10.51	10.95	11.35	11.77	-	-	
3055015 *	2.5	15	60	4	4.85	6	15.72	16.3	16.89	-	-	-	
3055020 *	2.5	20	70	4	4.85	6	20.91	21.65	-	-	-	-	
3055025 *	2.5	25	70	4	4.85	6	26.09	27	-	-	-	-	
3055030 *	2.5	30	80	4	4.85	6	31.26	-	-	-	-	-	
3055035 *	2.5	35	80	4	4.85	6	36.43	-	-	-	-	-	
3055040 *	2.5	40	90	4	4.85	6	41.59	-	-	-	-	-	
3055045 *	2.5	45	100	4	4.85	6	46.76	-	-	-	-	-	
3055050 *	2.5	50	100	4	4.85	6	51.93	-	-	-	-	-	
3056012 *	3	12	60	4.8	5.85	6	-	-	-	-	-	-	
3056020 *	3	20	70	4.8	5.85	6	-	-	-	-	-	-	
3056025 *	3	25	70	4.8	5.85	6	-	-	-	-	-	-	
3056030 *	3	30	80	4.8	5.85	6	-	-	-	-	-	-	
3056035 *	3	35	80	4.8	5.85	6	-	-	-	-	-	-	
3056040 *	3	40	90	4.8	5.85	6	-	-	-	-	-	-	
3056045 *	3	45	100	4.8	5.85	6	-	-	-	-	-	-	
3056050 *	3	50	120	4.8	5.85	6	-	-	-	-	-	-	



WXS



WXS-LN-EBD	Applications - Anwendungen - Applicazioni - Applications													
	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.	
	○	○	⊙	⊙	○	○	○	○	○		○	○		

Radius end mills - Mehrschneider mit Eckenradius - Frese toriche - Fraises à rayons

**NEW**

\* HIGH PERFORMANCE

**NEU**

\* HIGH PERFORMANCE

**NUOVO**

\* ALTA PERFORMANCE

**NOUVEAU**

\* HAUTE PERFORMANCE

**WXS-CPR**



EDP	R	D	α	l1	d1	d2	l	l2	d	L	Type	€
3100401	0.05	0.4	0°	1	0.37	-	0.3	7.77	4	50	1	
3100402	0.05	0.4	0°	1.5	0.37	-	0.3	8.27	4	50	1	
3100403	0.05	0.4	0°	2	0.37	-	0.3	8.77	2	50	1	
3100404	0.05	0.4	0°	3	0.37	-	0.3	9.77	4	50	1	
3100405	0.05	0.4	0°	4	0.37	-	0.3	10.77	4	50	1	
3100409	0.05	0.4	1°	3	0.37	0.49	0.3	9.54	4	50	2	
3100410	0.05	0.4	1°	4	0.37	0.53	0.3	10.47	4	50	2	
3100411	0.05	0.4	3°	3	0.37	0.68	0.3	9.18	4	50	2	
3100412	0.05	0.4	3°	4	0.37	0.79	0.3	9.99	4	50	2	
3100413	0.05	0.4	5°	3	0.37	0.87	0.3	8.83	4	50	2	
3100414	0.05	0.4	5°	4	0.37	1.05	0.3	9.50	4	50	2	
3100406	0.1	0.4	0°	2	0.37	-	0.3	8.77	4	50	1	
3100407	0.1	0.4	0°	3	0.37	-	0.3	9.77	4	50	1	
3100408	0.1	0.4	0°	4	0.37	-	0.3	10.77	4	50	1	
3100415	0.1	0.4	1°	3	0.37	0.49	0.3	9.54	4	50	2	
3100416	0.1	0.4	1°	4	0.37	0.53	0.3	10.47	4	50	2	
3100417	0.1	0.4	3°	3	0.37	0.68	0.3	9.18	4	50	2	
3100418	0.1	0.4	3°	4	0.37	0.79	0.3	9.99	4	50	2	
3100419	0.1	0.4	5°	3	0.37	0.87	0.3	8.83	4	50	2	
3100420	0.1	0.4	5°	4	0.37	1.05	0.3	9.50	4	50	2	
3100501	0.05	0.5	0°	1	0.46	-	0.4	7.60	4	50	1	
3100502	0.05	0.5	0°	2	0.46	-	0.4	8.60	4	50	1	
3100503	0.05	0.5	0°	3	0.46	-	0.4	9.60	4	50	1	
3100504	0.05	0.5	0°	4	0.46	-	0.4	10.60	4	50	1	
3100505	0.05	0.5	0°	5	0.46	-	0.4	11.60	4	50	1	
3100506	0.05	0.5	0°	6	0.46	-	0.4	12.60	4	50	1	
3100513	0.05	0.5	1°	3	0.46	0.59	0.4	9.36	4	50	2	
3100514	0.05	0.5	1°	5	0.46	0.66	0.4	11.23	4	50	2	
3100515	0.05	0.5	1°	8	0.46	0.77	0.4	14.03	4	50	2	
3100516	0.05	0.5	1°	10	0.46	0.84	0.4	15.90	4	50	2	
3100517	0.05	0.5	1°	12	0.46	0.91	0.4	17.77	4	50	2	
3100518	0.05	0.5	3°	3	0.46	0.77	0.4	9.02	4	50	2	
3100519	0.05	0.5	3°	5	0.46	0.98	0.4	10.63	4	50	2	
3100520	0.05	0.5	3°	8	0.46	1.30	0.4	13.04	4	50	2	
3100521	0.05	0.5	3°	10	0.46	1.51	0.4	14.65	4	50	2	
3100522	0.05	0.5	3°	12	0.46	1.72	0.4	16.26	4	50	2	
3100523	0.05	0.5	5°	3	0.46	0.96	0.4	8.68	4	50	2	
3100524	0.05	0.5	5°	5	0.46	1.31	0.4	10.02	4	50	2	
3100525	0.05	0.5	5°	8	0.46	1.83	0.4	12.04	24	50	2	
3100526	0.05	0.5	5°	10	0.46	2.18	0.4	13.39	4	50	2	
3100507	0.1	0.5	0°	1	0.46	-	0.4	7.60	4	50	1	
3100508	0.1	0.5	0°	2	0.46	-	0.4	8.60	4	50	1	
3100509	0.1	0.5	0°	3	0.46	-	0.4	9.60	4	50	1	
3100510	0.	0.5	0°	4	0.46	-	0.4	10.60	4	50	1	
3100511	0.1	0.5	0°	5	0.46	-	0.4	11.60	4	50	1	
3100512	0.1	0.5	0°	6	0.46	-	0.4	12.60	4	50	1	

WXS



## Radius end mills - Mehrschneider mit Eckenradius - Frese toriche - Fraises à rayons

WXS-CPR

EDP	R	D	$\alpha$	l1	d1	d2	l	l2	d	L	Type	€
3100527	0.1	0.5	1°	3	0.46	0.59	0.4	9.36	4	50	2	
3100528	0.1	0.5	1°	5	0.46	0.66	0.4	11.23	4	50	2	
3100529	0.1	0.5	1°	8	0.46	0.77	0.4	14.03	4	50	2	
3100530	0.1	0.5	1°	10	0.46	0.84	0.4	15.90	4	50	2	
3100531	0.1	0.5	1°	12	0.46	0.91	0.4	17.77	4	50	2	
3100532	0.1	0.5	3°	3	0.46	0.77	0.4	9.02	4	50	2	
3100533	0.1	0.5	3°	5	0.46	0.98	0.4	10.63	4	50	2	
3100534	0.1	0.5	3°	8	0.46	1.30	0.4	13.04	4	50	2	
3100535	0.1	0.5	3°	10	0.46	1.51	0.4	14.65	4	50	2	
3100536	0.1	0.5	3°	12	0.46	1.72	0.4	16.26	4	50	2	
3100537	0.1	0.5	5°	3	0.46	0.96	0.4	8.68	4	50	2	
3100538	0.1	0.5	5°	5	0.46	1.31	0.4	10.02	4	50	2	
3100539	0.1	0.5	5°	8	0.46	1.83	0.4	12.04	4	50	2	
3100540	0.1	0.5	5°	10	0.46	2.18	0.4	13.39	4	50	2	
3100601	0.1	0.6	0°	2	0.56	-	0.48	8.41	4	50	1	
3100602	0.1	0.6	0°	4	0.56	-	0.48	10.41	4	50	1	
3100603	0.1	0.6	0°	6	0.56	-	0.48	12.41	4	50	1	
3100806	0.05	0.8	1°	5	0.76	0.95	0.65	10.68	4	50	2	
3100807	0.05	0.8	1°	8	0.76	1.06	0.65	13.49	4	50	2	
3100808	0.05	0.8	3°	5	0.76	1.26	0.65	10.12	4	50	2	
3100809	0.05	0.8	3°	8	0.76	1.57	0.65	12.53	4	50	2	
3100801	0.1	0.8	0°	4	0.76	-	0.65	10.04	4	50	1	
3100802	0.1	0.8	0°	6	0.76	-	0.65	12.04	4	50	1	
3100810	0.1	0.8	1°	5	0.76	0.95	0.65	10.68	4	50	2	
3100811	0.1	0.8	1°	8	0.76	1.06	0.65	13.49	4	50	2	
3100812	0.1	0.8	3°	5	0.76	1.26	0.65	10.12	4	50	2	
3100813	0.1	0.8	3°	8	0.76	1.57	0.65	12.53	4	50	2	
3100803	0.2	0.8	0°	4	0.76	-	0.65	10.04	4	50	1	
3100804	0.2	0.8	0°	6	0.76	-	0.65	12.04	4	50	1	
3100805	0.2	0.8	0°	8	0.76	-	0.65	14.04	4	50	1	
3100814	0.2	0.8	1°	5	0.76	0.95	0.65	10.68	4	50	2	
3100815	0.2	0.8	1°	8	0.76	1.06	0.65	13.49	4	50	2	
3100816	0.2	0.8	3°	5	0.76	1.26	0.65	10.12	4	50	2	
3100817	0.2	0.8	3°	8	0.76	1.57	0.65	12.53	4	50	2	
3101001	0.05	1	0°	4	0.95	-	0.8	9.69	4	50	1	
3101002	0.05	1	0°	6	0.95	-	0.8	11.69	4	50	1	
3101003	0.05	1	0°	8	0.95	-	0.8	13.69	4	50	1	
3101004	0.05	1	0°	10	0.95	-	0.8	15.69	4	50	1	
3101005	0.05	1	0°	12	0.95	-	0.8	17.69	4	50	1	
3101023	0.05	1	1°	6	0.95	1.18	0.8	11.25	4	50	2	
3101024	0.05	1	1°	10	0.95	1.32	0.8	14.99	4	60	2	
3101025	0.05	1	1°	15	0.95	1.50	0.8	19.67	4	60	2	
3101026	0.05	1	1°	20	0.95	1.67	0.8	24.34	4	60	2	
3101027	0.05	1	1°	25	0.95	1.85	0.8	29.02	4	70	2	
3101028	0.05	1	1°	30	0.95	2.02	0.8	33.69	4	80	2	
3101029	0.05	1	1°	35	0.95	2.19	0.8	38.37	4	80	2	
3101030	0.05	1	3°	6	0.95	1.55	0.8	10.58	4	50	2	
3101031	0.05	1	3°	10	0.95	1.96	0.8	13.79	4	60	2	
3101006	0.1	1	0°	4	0.95	-	0.8	9.69	4	50	1	
3101007	0.1	1	0°	6	0.95	-	0.8	11.69	4	50	1	
3101008	0.1	1	0°	8	0.95	-	0.8	13.69	4	50	1	
3101009	0.1	1	0°	10	0.95	-	0.8	15.69	4	50	1	
3101010	0.1	1	0°	12	0.95	-	0.8	17.69	4	50	1	
3101032	0.1	1	1°	6	0.95	1.18	0.8	11.25	4	50	2	
3101033	0.1	1	1°	10	0.95	1.32	0.8	14.99	4	60	2	
3101034	0.1	1	1°	15	0.95	1.50	0.8	19.67	4	60	2	
3101035	0.1	1	1°	20	0.95	1.67	0.8	24.34	4	60	2	
3101036	0.1	1	1°	25	0.95	1.85	0.8	29.02	4	70	2	
3101037	0.1	1	1°	30	0.95	2.02	0.8	33.69	4	80	2	
3101038	0.1	1	1°	35	0.95	2.19	0.8	38.37	4	80	2	
3101039	0.1	1	3°	6	0.95	1.55	0.8	10.58	4	50	2	
3101040	0.1	1	3°	10	0.95	1.96	0.8	13.79	4	60	2	
3101011	0.2	1	0°	4	0.95	-	0.8	9.69	4	50	1	
3101012	0.2	1	0°	6	0.95	-	0.8	11.69	4	50	1	
3101013	0.2	1	0°	8	0.95	-	0.8	13.69	4	50	1	
3101014	0.2	1	0°	10	0.95	-	0.8	15.69	4	50	1	
3101015	0.2	1	0°	12	0.95	-	0.8	17.69	4	50	1	



WXS



## Radius end mills - Mehrschneider mit Eckenradius - Frese toriche - Fraises à rayons

WXS-CPR

EDP	R	D	$\alpha$	l1	d1	d2	l	l2	d	L	Type	€
3101016	0.2	1	0°	16	0.95	-	0.8	21.69	4	60	1	
3101017	0.2	1	0°	20	0.95	-	0.8	25.69	4	60	1	
3101041	0.2	1	1°	6	0.95	1.18	0.8	11.25	4	50	2	
3101042	0.2	1	1°	10	0.95	1.32	0.8	14.99	4	60	2	
3101043	0.2	1	1°	15	0.95	1.50	0.8	19.67	4	60	2	
3101044	0.2	1	1°	20	0.95	1.67	0.8	24.34	4	60	2	
3101045	0.2	1	1°	25	0.95	1.85	0.8	29.02	4	70	2	
3101046	0.2	1	1°	30	0.95	2.02	0.8	33.69	4	80	2	
3101047	0.2	1	1°	35	0.95	2.19	0.8	38.37	4	80	2	
3101048	0.2	1	3°	6	0.95	1.55	0.8	10.58	4	50	2	
3101049	0.2	1	3°	10	0.95	1.96	0.8	13.79	4	60	2	
3101018	0.3	1	0°	4	0.95	-	0.8	9.69	4	50	1	
3101019	0.3	1	0°	6	0.95	-	0.8	11.69	4	50	1	
3101020	0.3	1	0°	8	0.95	-	0.8	13.69	4	50	1	
3101021	0.3	1	0°	10	0.95	-	0.8	15.69	4	50	1	
3101022	0.3	1	0°	12	0.95	-	0.8	17.69	4	50	1	
3101050	0.3	1	1°	6	0.95	1.18	0.8	11.25	4	50	2	
3101051	0.3	1	1°	10	0.95	1.32	0.8	14.99	4	60	2	
3101052	0.3	1	1°	15	0.95	1.50	0.8	19.67	4	60	2	
3101053	0.3	1	1°	20	0.95	1.67	0.8	24.34	4	60	2	
3101054	0.3	1	1°	25	0.95	1.85	0.8	29.02	4	70	2	
3101055	0.3	1	1°	30	0.95	2.02	0.8	33.69	4	80	2	
3101056	0.3	1	1°	35	0.95	2.19	0.8	38.37	4	80	2	
3101057	0.3	1	3°	6	0.95	1.55	0.8	10.58	4	50	2	
3101058	0.3	1	3°	10	0.95	1.96	0.8	13.79	4	60	2	
3101201	0.2	1.2	0°	6	1.15	-	1	11.31	4	50	1	
3101202	0.2	1.2	0°	8	1.15	-	1	13.31	4	50	1	
3101203	0.2	1.2	0°	10	1.15	-	1	15.31	4	50	1	
3101204	0.3	1.2	0°	6	1.15	-	1	11.31	4	50	1	
3101205	0.3	1.2	0°	8	1.15	-	1	13.31	4	50	1	
3101206	0.3	1.2	0°	10	1.15	-	1	15.31	4	50	1	
3101511	0.1	1.5	1°	10	1.45	1.81	1.2	14.09	4	60	2	
3101512	0.1	1.5	1°	15	1.45	1.98	1.2	18.76	4	60	2	
3101513	0.1	1.5	1°	20	1.45	2.16	1.2	23.44	4	60	2	
3101514	0.1	1.5	1°	25	1.45	2.33	1.2	28.11	4	70	2	
3101515	0.1	1.5	1°	30	1.45	2.51	1.2	32.78	4	80	2	
3101516	0.1	1.5	3°	10	1.45	2.42	1.2	12.94	4	60	2	
3101517	0.1	1.5	3°	15	1.45	2.95	1.2	16.96	4	60	2	
3101501	0.2	1.5	0°	6	1.45	-	1.2	10.75	4	50	1	
3101502	0.2	1.5	0°	8	1.45	-	1.2	12.75	4	50	1	
3101503	0.2	1.5	0°	10	1.45	-	1.2	14.75	4	50	1	
3101504	0.2	1.5	0°	12	1.45	-	1.2	16.75	4	50	1	
3101505	0.2	1.5	0°	16	1.45	-	1.2	20.75	4	50	1	
3101518	0.2	1.5	1°	10	1.45	1.81	1.2	14.09	4	60	2	
3101519	0.2	1.5	1°	15	1.45	1.98	1.2	18.76	4	60	2	
3101520	0.2	1.5	1°	20	1.45	2.16	1.2	23.44	4	60	2	
3101521	0.2	1.5	1°	25	1.45	2.33	1.2	28.11	4	70	2	
3101522	0.2	1.5	1°	30	1.45	2.51	1.2	32.78	4	80	2	
3101523	0.2	1.5	3°	10	1.45	2.42	1.2	12.94	4	60	2	
3101524	0.2	1.5	3°	15	1.45	2.95	1.2	16.96	4	60	2	
3101506	0.3	1.5	0°	6	1.45	-	1.2	10.75	4	50	1	
3101507	0.3	1.5	0°	8	1.45	-	1.2	12.75	4	50	1	
3101508	0.3	1.5	0°	10	1.45	-	1.2	14.75	4	50	1	
3101509	0.3	1.5	0°	12	1.45	-	1.2	16.75	4	50	1	
3101510	0.3	1.5	0°	16	1.45	-	1.2	20.75	4	50	1	
3101525	0.3	1.5	1°	10	1.45	1.81	1.2	14.09	4	60	2	
3101526	0.3	1.5	1°	15	1.45	1.98	1.2	18.76	4	60	2	
3101527	0.3	1.5	1°	20	1.45	2.16	1.2	23.44	4	60	2	
3101528	0.3	1.5	1°	25	1.45	2.33	1.2	28.11	4	70	2	
3101529	0.3	1.5	1°	30	1.45	2.51	1.2	32.78	4	80	2	
3101530	0.3	1.5	3°	10	1.45	2.42	1.2	12.94	4	60	2	
3101531	0.3	1.5	3°	15	1.45	2.95	1.2	16.96	4	60	2	
3102001	0.1	2	0°	8	1.95	-	1.6	11.82	4	50	1	
3102002	0.1	2	0°	10	1.95	-	1.6	13.82	4	50	1	
3102003	0.1	2	0°	12	1.95	-	1.6	15.82	4	50	1	
3102004	0.1	2	0°	16	1.95	-	1.6	19.82	4	60	1	
3102005	0.1	2	0°	20	1.95	-	1.6	23.82	4	60	1	

WXS



## Radius end mills - Mehrschneider mit Eckenradius - Frese toriche - Fraises à rayons

WXS-CPR

EDP	R	D	$\alpha$	l1	d1	d2	l	l2	d	L	Type	€
3102006	0.1	2	0°	25	1.95	-	1.6	28.82	4	70	1	
3102025	0.1	2	1°	15	1.95	2.47	1.6	17.85	4	60	2	
3102026	0.1	2	1°	20	1.95	2.64	1.6	22.53	4	60	2	
3102027	0.1	2	1°	25	1.95	2.82	1.6	27.20	4	70	2	
3102028	0.1	2	1°	30	1.95	2.99	1.6	31.88	4	80	2	
3102029	0.1	2	1°	40	1.95	3.34	1.6	41.23	4	80	2	
3102030	0.1	2	1°	50	1.95	3.69	1.6	50.57	4	100	2	
3102031	0.1	2	3°	15	1.95	3.41	1.6	16.11	4	60	2	
3102032	0.1	2	3°	20	1.95	3.93	1.6	20.13	4	60	2	
3102007	0.2	2	0°	8	1.95	-	1.6	11.82	4	50	1	
3102008	0.2	2	0°	10	1.95	-	1.6	13.82	4	50	1	
3102009	0.2	2	0°	12	1.95	-	1.6	15.82	4	50	1	
3102010	0.2	2	0°	16	1.95	-	1.6	19.82	4	60	1	
3102011	0.2	2	0°	20	1.95	-	1.6	23.82	4	60	1	
3102012	0.2	2	0°	25	1.95	-	1.6	28.82	4	70	1	
3102033	0.2	2	1°	15	1.95	2.47	1.6	17.85	4	60	2	
3102034	0.2	2	1°	20	1.95	2.64	1.6	22.53	4	60	2	
3102035	0.2	2	1°	25	1.95	2.82	1.6	27.20	4	70	2	
3102036	0.2	2	1°	30	1.95	2.99	1.6	31.88	4	80	2	
3102037	0.2	2	1°	40	1.95	3.34	1.6	41.23	4	80	2	
3102038	0.2	2	1°	50	1.95	3.69	1.6	50.57	4	100	2	
3102039	0.2	2	3°	15	1.95	3.41	1.6	16.11	4	60	2	
3102040	0.2	2	3°	20	1.95	3.93	1.6	20.13	4	60	2	
3102013	0.3	2	0°	8	1.95	-	1.6	11.82	4	50	1	
3102014	0.3	2	0°	10	1.95	-	1.6	13.82	4	50	1	
3102015	0.3	2	0°	12	1.95	-	1.6	15.82	4	50	1	
3102016	0.3	2	0°	16	1.95	-	1.6	19.82	4	60	1	
3102017	0.3	2	0°	20	1.95	-	1.6	23.82	4	60	1	
3102018	0.3	2	0°	25	1.95	-	1.6	28.82	4	70	1	
3102041	0.3	2	1°	15	1.95	2.47	1.6	17.85	4	60	2	
3102042	0.3	2	1°	20	1.95	2.64	1.6	22.53	4	60	2	
3102043	0.3	2	1°	25	1.95	2.82	1.6	27.20	4	70	2	
3102044	0.3	2	1°	30	1.95	2.99	1.6	31.88	4	80	2	
3102045	0.3	2	1°	40	1.95	3.34	1.6	41.23	4	80	2	
3102046	0.3	2	1°	50	1.95	3.69	1.6	50.57	4	100	2	
3102047	0.3	2	3°	15	1.95	3.41	1.6	16.11	4	60	2	
3102048	0.3	2	3°	20	1.95	3.93	1.6	20.13	4	60	2	
3102019	0.5	2	0°	8	1.95	-	1.6	11.82	4	50	1	
3102020	0.5	2	0°	10	1.95	-	1.6	13.82	4	50	1	
3102021	0.5	2	0°	12	1.95	-	1.6	15.82	4	50	1	
3102022	0.5	2	0°	16	1.95	-	1.6	19.82	4	60	1	
3102023	0.5	2	0°	20	1.95	-	1.6	23.82	4	60	1	
3102024	0.5	2	0°	25	1.95	-	1.6	28.82	4	70	1	
3102049	0.5	2	1°	15	1.95	2.47	1.6	17.85	4	60	2	
3102050	0.5	2	1°	20	1.95	2.64	1.6	22.53	4	60	2	
3102051	0.5	2	1°	25	1.95	2.82	1.6	27.20	4	70	2	
3102052	0.5	2	1°	30	1.95	2.99	1.6	31.88	4	80	2	
3102053	0.5	2	1°	40	1.95	3.34	1.6	41.23	4	80	2	
3102054	0.5	2	1°	50	1.95	3.69	1.6	50.57	4	100	2	
3102055	0.5	2	3°	15	1.95	3.41	1.6	16.11	4	60	2	
3102056	0.5	2	3°	20	1.95	3.93	1.6	20.13	4	60	2	
3102501	0.2	2.5	0°	10	2.4	-	2.2	12.98	4	50	1	
3102502	0.2	2.5	0°	20	2.4	-	2.2	22.98	4	60	1	
3102503	0.2	2.5	0°	30	2.4	-	2.2	32.98	4	70	1	
3102504	0.5	2.5	0°	10	2.4	-	2.2	12.98	4	50	1	
3102505	0.5	2.5	0°	20	2.4	-	2.2	22.98	4	60	1	
3102506	0.5	2.5	0°	30	2.4	-	2.2	32.98	4	70	1	
3103001	0.2	3	0°	8	2.85	-	2.5	13.87	6	60	1	
3103002	0.2	3	0°	12	2.85	-	2.5	17.87	6	60	1	
3103003	0.2	3	0°	16	2.85	-	2.5	21.87	6	60	1	
3103004	0.2	3	0°	20	2.85	-	2.5	25.87	6	70	1	
3103005	0.2	3	0°	25	2.85	-	2.5	30.87	6	70	1	
3103006	0.2	3	0°	30	2.85	-	2.5	35.87	6	70	1	
3103007	0.2	3	0°	35	2.85	-	2.5	40.87	6	80	1	
3103020	0.2	3	1°	15	2.85	3.44	2.5	19.78	6	60	2	
3103021	0.2	3	1°	20	2.85	3.61	2.5	24.45	6	60	2	
3103022	0.2	3	1°	30	2.85	3.96	2.5	33.80	6	80	2	



WXS



## Radius end mills - Mehrschneider mit Eckenradius - Frese toriche - Fraises à rayons

WXS-CPR



EDP	R	D	$\alpha$	l1	d1	d2	l	l2	d	L	Type	€
3103023	0.2	3	1°	40	2.85	4.31	2.5	43.15	6	80	2	
3103024	0.2	3	1°	50	2.85	4.66	2.5	52.50	6	100	2	
3103025	0.2	3	1°	60	2.85	5.01	2.5	61.85	6	110	2	
3103008	0.3	3	0°	12	2.85	-	2.5	17.87	6	60	1	
3103009	0.3	3	0°	16	2.85	-	2.5	21.87	6	60	1	
3103010	0.3	3	0°	20	2.85	-	2.5	25.87	6	70	1	
3103011	0.3	3	0°	25	2.85	-	2.5	30.87	6	70	1	
3103012	0.3	3	0°	30	2.85	-	2.5	35.87	6	70	1	
3103013	0.3	3	0°	35	2.85	-	2.5	40.87	6	80	1	
3103014	0.5	3	0°	12	2.85	-	2.5	17.87	6	60	1	
3103015	0.5	3	0°	16	2.85	-	2.5	21.87	6	60	1	
3103016	0.5	3	0°	20	2.85	-	2.5	25.87	6	70	1	
3103017	0.5	3	0°	25	2.85	-	2.5	30.87	6	70	1	
3103018	0.5	3	0°	30	2.85	-	2.5	35.87	6	70	1	
3103019	0.5	3	0°	35	2.85	-	2.5	40.87	6	80	1	
3103026	0.5	3	1°	15	2.85	3.44	2.5	19.78	6	60	2	
3103027	0.5	3	1°	20	2.85	3.61	2.5	24.45	6	60	2	
3103028	0.5	3	1°	30	2.85	3.96	2.5	33.80	6	80	2	
3103029	0.5	3	1°	40	2.85	4.31	2.5	43.15	6	80	2	
3103030	0.5	3	1°	50	2.85	4.66	2.5	52.50	6	100	2	
3103031	0.5	3	1°	60	2.85	5.01	2.5	61.85	6	110	2	
3104001	0.2	4	0°	16	3.84	-	4	20.01	6	60	1	
3104002	0.2	4	0°	20	3.84	-	4	24.01	6	60	1	
3104003	0.2	4	0°	25	3.84	-	4	29.01	6	70	1	
3104004	0.2	4	0°	30	3.84	-	4	34.01	6	70	1	
3104005	0.2	4	0°	40	3.84	-	4	44.01	6	90	1	
3104006	0.2	4	0°	50	3.84	-	4	54.01	6	100	1	
3104007	0.3	4	0°	16	3.84	-	4	20.01	6	60	1	
3104008	0.3	4	0°	20	3.84	-	4	24.01	6	60	1	
3104009	0.3	4	0°	25	3.84	-	4	29.01	6	70	1	
3104010	0.3	4	0°	30	3.84	-	4	34.01	6	70	1	
3104011	0.3	4	0°	40	3.84	-	4	44.01	6	90	1	
3104012	0.3	4	0°	50	3.84	-	4	54.01	6	100	1	
3104013	0.5	4	0°	16	3.84	-	4	20.01	6	60	1	
3104014	0.5	4	0°	20	3.84	-	4	24.01	6	60	1	
3104015	0.5	4	0°	25	3.84	-	4	29.01	6	70	1	
3104016	0.5	4	0°	30	3.84	-	4	34.01	6	70	1	
3104017	0.5	4	0°	40	3.84	-	4	44.01	6	90	1	
3104018	0.5	4	0°	50	3.84	-	4	54.01	6	100	1	
3104019	1	4	0°	16	3.84	-	4	20.01	6	60	1	
3104020	1	4	0°	20	3.84	-	4	24.01	6	60	1	
3104021	1	4	0°	25	3.84	-	4	29.01	6	70	1	
3104022	1	4	0°	30	3.84	-	4	34.01	6	70	1	
3104023	1	4	0°	40	3.84	-	4	44.01	6	90	1	
3104024	1	4	0°	50	3.84	-	4	54.01	6	100	1	

WXS



WXS-CPR	Applications - Anwendungen - Applicazioni - Applications												
	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
	☉	☉	☉	☉		☉							

Slotting end mills - 2 Schneiden Schafffräser - Frese per nervature - Fraises à rainurer

**\* NEW**

- \* HIGH PERFORMANCE
- \* Protected corner

**\* NEU**

- \* HIGH PERFORMANCE
- \* Kantenschutzfäse

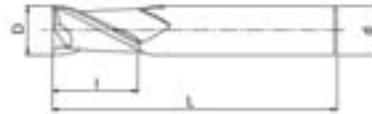
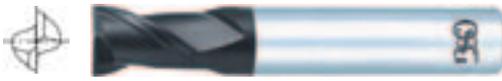
**\* NUOVO**

- \* ALTA PERFORMANCE
- \* Angolo rinforzato con micro smusso

**\* NOUVEAU**

- \* HAUTE PERFORMANCE
- \* Angle renforcé avec micro-chanfrein

**WX-G-EDSS**



EDP	D	L	l	d	€
3019010	1	40	1.5	4	
3019012	*	1.2	40	1.8	4
3019015		1.5	40	2.3	4
3019018	*	1.8	40	2.7	4
3019020		2	40	3	4
3019025		2.5	40	3.7	4
3019028	*	2.8	40	4.2	4
3019030		3	50	4.5	6
3019035		3.5	50	5.2	6
3019040		4	50	6	6

EDP	D	L	l	d	€
3019045		4.5	50	6.8	6
3019050		5	50	7.5	6
3019055		5.5	50	8.2	6
3019060		6	50	9	6
3019070	*	7	60	11	8
3019080		8	60	12	8
3019090	*	9	70	14	10
3019100		10	70	15	10
3019120		12	75	18	12

- \* HIGH PERFORMANCE
- \* Sharp corner dege

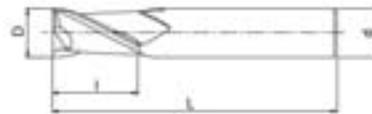
- \* HIGH PERFORMANCE
- \* Scharfe Schneide

- \* ALTA PERFORMANCE
- \* Affilato angolo del tagliente

- \* HAUTE PERFORMANCE
- \* Angle vif

**WX-EDS**

**WX**



EDP	D	L	l	d	€
3010502	0.2	40	0.4	4	
3010503	0.3	40	0.6	4	
3010504	0.4	40	0.8	4	
3010505	0.5	40	1	4	
3010506	0.6	40	1.2	4	
3010507	0.7	40	1.4	4	
3010508	0.8	40	1.6	4	
3010509	0.9	40	2	4	
3010510	1	40	2.5	4	
3010512	1.2	40	4	4	
3010515	1.5	40	4	4	
3010518	1.8	40	5	4	
3010520	2	40	6	4	
3010525	2.5	40	8	4	

EDP	D	L	l	d	€
3010528	2.8	40	8	4	
3010530	3	45	8	6	
3010535	3.5	45	10	6	
3010540	4	45	11	6	
3010545	4.5	45	11	6	
3010550	5	50	13	6	
3010555	5.5	50	13	6	
3010560	6	50	13	6	
3010570	7	60	16	8	
3010580	8	60	19	8	
3010590	9	70	19	10	
3010600	10	70	22	10	
3010620	12	75	26	12	

		Applications		Anwendungen		Applicazioni		Applications						
		~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
WX-G-EDSS	⊙	⊙	○	○			○	⊙	○	○		○	○	
	⊙	⊙	○	○			⊙	⊙	○	○		○	○	
WX-EDS	⊙	⊙	○	○			⊙	⊙	⊙	○		○	○	
	⊙	⊙	○	○			⊙	⊙	⊙	○		○	○	

OSG Europe : www.osgeurope.com

Multiflute end mills - Mehrschneider - Fresa multidenti - Fraises multilèvres



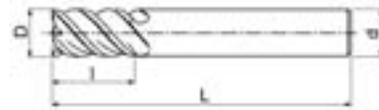
- \* HIGH PERFORMANCE
- \* End mill for big production
- \* Corner protection

- \* HIGH PERFORMANCE
- \* Kantenschutzfase

- \* ALTA PERFORMANCE
- \* Frese per grande produzione
- \* Angolo rinforzato con micro smusso

- \* HAUTE PERFORMANCE
- \* Fraise pour grande production
- \* Angle renforcé avec micro-CHANFREIN

WX-G-ETSS



P. 103

EDP	D	L	l	d	€
48120030	3	50	4.5	6	
48120040	4	50	6	6	
48120050	5	50	7.5	6	
48120060	6	50	9	6	

EDP	D	L	l	d	€
48120080	8	60	12	8	
48120100	10	70	15	10	
48120120	12	75	18	12	
48120160	16	100	24	16	

WX



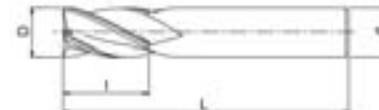
- \* HIGH PERFORMANCE
- \* Protected corner

- \* HIGH PERFORMANCE
- \* Kantenschutzfase

- \* ALTA PERFORMANCE
- \* Angolo rinforzato con micro smusso

- \* HAUTE PERFORMANCE
- \* Angle renforcé avec micro-CHANFREIN

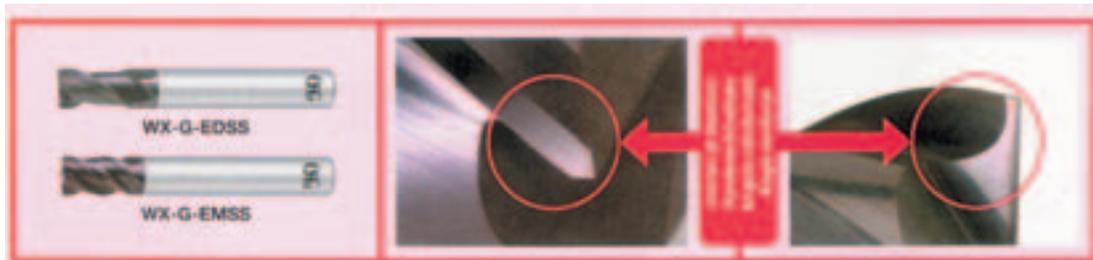
WX-G-EMSS



P. 104

EDP	D	L	l	d	€
3019330	3	50	4.5	6	
3019340	4	50	6	6	
3019350	5	50	7.5	6	
3019360	6	50	9	6	

EDP	D	L	l	d	€
3019380	8	60	12	8	
3019400	10	70	15	10	
3019420	12	75	18	12	

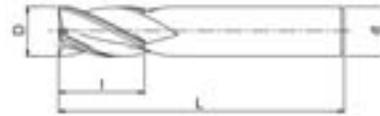


	Applications		Anwendungen		Applicazioni		Applications						
WX-G-ETSS	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
	⊙	⊙	○			⊙					⊙		
WX-G-EMSS	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
	⊙	⊙	○	○		○	⊙	○	○		○	○	

### Multiflute end mills - Mehrschneider - Fresa multidenti - Fraises multilèvres

- \* **HIGH PERFORMANCE**  
\* Sharp corner edge
- \* **HIGH PERFORMANCE**  
\* Scharfe Schneide
- \* **ALTA PERFORMANCE**  
\* Affilato angolo del tagliente
- \* **HAUTE PERFORMANCE**  
\* Angle vif

**WX-EMS**



P. 104

EDP	D	L	l	d	€
3013020	2	40	6	4	
3013025	2.5	40	8	4	
3013030	3	45	8	6	
3013040	4	45	11	6	
3013050	5	50	13	6	

EDP	D	L	l	d	€
3013060	6	50	13	6	
3013070	7	60	16	8	
3013080	8	60	19	8	
3013090	9	70	19	10	

- \* **HIGH PERFORMANCE**  
\* Big cutdepth
  - \* **HIGH PERFORMANCE**  
\* Maximale Schnitttiefe
  - \* **ALTA PERFORMANCE**  
\* Elevato profondita' di taglio
  - \* **HAUTE PERFORMANCE**  
\* Grande profondeur de coupe
- \* Protected corner
  - \* Kantenschutzfase
  - \* Angolo rinforzato con micro smusso
  - \* Angle renforcé avec micro-chanfrein

**WX**



**WX-PHS**



P. 106-107

EDP	D	L	l	d	€
3016030	3	60	8	6	
3016040	4	60	11	6	
3016050	5	60	13	6	
3016060	6	60	13	6	
3016080	8	80	19	8	

EDP	D	L	l	d	€
3016100	10	80	22	10	
3016120	12	100	26	12	
3016160	16	115	32	16	
3016200	20	125	38	20	

	Applications		Anwendungen		Applicazioni		Applications						
<b>WX-EMS</b>	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
	⊙	⊙	○	○		○	⊙	○	○		○	○	
<b>WX-PHS</b>	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
	⊙	⊙	○	○		⊙	⊙	○	○		⊙	⊙	

## Slotting end mills - Miniatur-Schaftfräser - Microfrese per nervature - Microfraises à rainurer

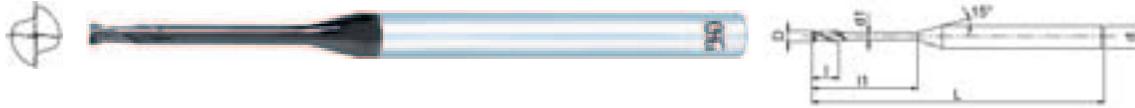
\* HIGH PERFORMANCE

\* HIGH PERFORMANCE

\* ALTA PERFORMANCE

\* HAUTE PERFORMANCE

WX-LN-EDS



P. 108-109

EDP	D	l1	L	l	d1	d	$\alpha$ (Le)						€
							0.5°	1°	1.5°	2°	2.5°	3°	
3020201	0.2	0.5	45	0.3	0.18	4	0.55	0.6	0.66	0.73	0.81	0.96	
3020202	0.2	1	45	0.3	0.18	4	1.09	1.19	1.3	1.41	1.53	1.66	
3020203	0.2	1.5	45	0.3	0.18	4	1.64	1.78	1.92	2.07	2.22	2.37	
3020302	0.3	1	45	0.45	0.28	4	1.09	1.19	1.3	1.41	1.53	1.66	
3020304	0.3	2	45	0.45	0.28	4	2.12	2.35	2.53	2.7	2.88	3.05	
3020306	0.3	3	45	0.45	0.28	4	3.26	3.5	3.72	3.94	4.15	4.36	
3020404	0.4	2	45	0.6	0.37	4	2.17	2.34	2.51	2.68	2.85	3.02	
3020406	0.4	3	45	0.6	0.37	4	3.24	3.48	3.7	3.91	4.12	4.32	
3020408	0.4	4	45	0.6	0.37	4	4.32	4.6	4.86	5.11	5.35	5.58	
3020502	0.5	2	45	0.7	0.45	4	2.16	2.31	2.47	2.63	2.79	2.96	
3020504	0.5	4	45	0.7	0.45	4	4.29	4.56	4.81	5.06	5.29	5.51	
3020506	0.5	6	45	0.7	0.45	4	6.42	6.77	7.1	7.39	7.68	7.99	
3020508	0.5	8	45	0.7	0.45	4	8.53	8.96	9.34	9.69	10.07	10.48	
3020602	0.6	2	45	0.9	0.55	4	2.16	2.31	2.47	2.63	2.79	2.96	
3020604	0.6	4	45	0.9	0.55	4	4.29	4.56	4.81	5.06	5.29	5.51	
3020606	0.6	6	45	0.9	0.55	4	6.42	6.77	7.1	7.39	7.68	7.99	
3020608	0.6	8	45	0.9	0.55	4	8.53	8.96	9.34	9.69	10.07	10.48	
3020610	0.6	10	45	0.9	0.55	4	10.64	11.13	11.56	11.99	12.46	12.97	
3020702	0.7	2	45	1	0.65	4	2.16	2.31	2.47	2.63	2.79	2.96	
3020704	0.7	4	45	1	0.65	4	4.29	4.56	4.81	5.06	5.29	5.51	
3020706	0.7	6	45	1	0.65	4	6.42	6.77	7.1	7.39	7.68	7.99	
3020708	0.7	8	45	1	0.65	4	8.53	8.96	9.34	9.69	10.07	10.48	
3020710	0.7	10	45	1	0.65	4	10.64	11.13	11.56	11.99	12.46	12.97	
3020804	0.8	4	45	1.2	0.75	4	4.29	4.56	4.81	5.06	5.29	5.51	
3020806	0.8	6	45	1.2	0.75	4	6.42	6.77	7.1	7.39	7.68	7.99	
3020808	0.8	8	45	1.2	0.75	4	8.53	8.96	9.34	9.69	10.07	10.48	
3020810	0.8	10	45	1.2	0.75	4	10.64	11.13	11.56	11.99	12.46	12.97	
3020812	0.8	12	45	1.2	0.75	4	12.74	13.29	13.78	14.29	14.85	15.45	
3020906	0.9	6	45	1.35	0.85	4	6.42	6.77	7.1	7.39	7.68	7.99	
3020908	0.9	8	45	1.35	0.85	4	8.53	8.96	9.34	9.69	10.07	10.48	
3020910	0.9	10	45	1.35	0.85	4	10.64	11.13	11.56	11.99	12.46	12.97	
3020915	0.9	15	50	1.35	0.85	4	15.88	16.51	17.1	17.74	18.43	19.18	
3021006	1	6	45	1.5	0.95	4	6.42	6.77	7.1	7.39	7.68	7.99	
3021008	1	8	45	1.5	0.95	4	8.53	8.96	9.34	9.69	10.07	10.48	
3021010	1	10	45	1.5	0.95	4	10.64	11.13	11.56	11.99	12.46	12.97	
3021012	1	12	45	1.5	0.95	4	12.74	13.29	13.78	14.29	14.85	15.45	
3021014	1	14	50	1.5	0.95	4	14.83	15.44	15.99	16.59	17.24	17.94	
3021016	1	16	50	1.5	0.95	4	16.92	17.58	18.21	18.89	19.63	20.43	
3021206	1.2	6	45	1.8	1.15	4	6.42	6.77	7.1	7.39	7.68	7.99	
3021208	1.2	8	45	1.8	1.15	4	8.53	8.96	9.34	9.69	10.07	10.48	
3021210	1.2	10	45	1.8	1.15	4	10.64	11.13	11.56	11.99	12.46	12.97	
3021212	1.2	12	45	1.8	1.15	4	12.74	13.29	13.78	14.29	14.85	15.45	
3021406	1.4	6	45	2.1	1.35	4	6.42	6.77	7.1	7.39	7.68	7.99	
3021408	1.4	8	45	2.1	1.35	4	8.53	8.96	9.34	9.69	10.07	10.48	
3021410	1.4	10	45	2.1	1.35	4	10.64	11.13	11.56	11.99	12.46	12.97	
3021412	1.4	12	45	2.1	1.35	4	12.74	13.29	13.78	14.29	14.85	15.45	
3021414	1.4	14	50	2.1	1.35	4	14.83	15.44	15.99	16.59	17.24	17.94	
3021416	1.4	16	50	2.1	1.35	4	16.92	17.58	18.21	18.89	19.63	20.43	
3021506	1.5	6	45	2.3	1.45	4	6.42	6.77	7.1	7.39	7.68	7.99	
3021508	1.5	8	45	2.3	1.45	4	8.53	8.96	9.34	9.69	10.07	10.48	
3021510	1.5	10	45	2.3	1.45	4	10.64	11.13	11.56	11.99	12.46	12.97	
3021512	1.5	12	45	2.3	1.45	4	12.74	13.29	13.78	14.29	14.85	15.45	
3021514	1.5	14	50	2.3	1.45	4	14.83	15.44	15.99	16.59	17.24	17.94	

WX



Slotting end mills - Miniatur-Schafffräser -Microfresse per nervature - Microfraises à rainurer

WX-LN-EDS



EDP	D	l1	L	l	d1	d	α (Le)						€
							0.5°	1°	1.5°	2°	2.5°	3°	
3021516	1.5	16	50	2.3	1.45	4	16.92	17.58	18.21	18.89	19.63	20.43	
3021518	1.5	18	55	2.3	1.45	4	19.01	19.71	20.43	21.19	22.02	22.91	
3021520	1.5	20	55	2.3	1.45	4	21.09	21.85	22.64	23.49	24.41	-	
3021606	1.6	6	45	2.4	1.55	4	6.42	6.77	7.1	7.39	7.68	7.99	
3021608	1.6	8	45	2.4	1.55	4	8.53	8.96	9.34	9.69	10.07	10.48	
3021610	1.6	10	45	2.4	1.55	4	10.64	11.13	11.56	11.99	12.46	12.97	
3021612	1.6	12	45	2.4	1.55	4	12.74	13.29	13.78	14.29	14.85	15.45	
3021614	1.6	14	50	2.4	1.55	4	14.83	15.44	15.99	16.59	17.24	17.94	
3021616	1.6	16	50	2.4	1.55	4	16.92	17.58	18.21	18.89	19.63	20.43	
3021618	1.6	18	55	2.4	1.55	4	19.01	19.71	20.43	21.19	22.02	22.91	
3021620	1.6	20	55	2.4	1.55	4	21.09	21.85	22.64	23.49	24.41	-	
3021806	1.8	6	45	2.7	1.75	4	6.42	6.77	7.1	7.39	7.68	7.99	
3021808	1.8	8	45	2.7	1.75	4	8.53	8.96	9.34	9.69	10.07	10.48	
3021810	1.8	10	45	2.7	1.75	4	10.64	11.13	11.56	11.99	12.46	12.97	
3021812	1.8	12	45	2.7	1.75	4	12.74	13.29	13.78	14.29	14.85	15.45	
3021814	1.8	14	50	2.7	1.75	4	14.83	15.44	15.99	16.59	17.24	17.94	
3021816	1.8	16	50	2.7	1.75	4	16.92	17.58	18.21	18.89	19.63	20.43	
3021818	1.8	18	55	2.7	1.75	4	19.01	19.71	20.43	21.19	22.02	22.91	
3021820	1.8	20	55	2.7	1.75	4	21.09	21.85	22.64	23.49	24.41	-	
3022006	2	6	45	3	1.95	4	6.42	6.77	7.1	7.39	7.68	7.99	
3022008	2	8	45	3	1.95	4	8.53	8.96	9.34	9.69	10.07	10.48	
3022010	2	10	45	3	1.95	4	10.64	11.13	11.56	11.99	12.46	12.97	
3022012	2	12	45	3	1.95	4	12.74	13.29	13.78	14.29	14.85	15.45	
3022014	2	14	50	3	1.95	4	14.83	15.44	15.99	16.59	17.24	17.94	
3022016	2	16	50	3	1.95	4	16.92	17.58	18.21	18.89	19.63	20.43	
3022018	2	18	55	3	1.95	4	19.01	19.71	20.43	21.19	22.02	22.91	
3022020	2	20	55	3	1.95	4	21.09	21.85	22.64	23.49	24.41	-	
3022025	2	25	60	3	1.95	4	26.285	27.2	28.19	-	-	-	
3022030	2	30	70	3	1.95	4	31.46	32.55	33.73	-	-	-	
3022508	2.5	8	45	3.7	2.4	4	8.47	8.87	9.22	9.57	9.94	10.34	
3022510	2.5	10	45	3.7	2.4	4	10.57	11.03	11.44	11.87	12.33	12.83	
3022512	2.5	12	45	3.7	2.4	4	12.66	13.18	13.66	14.17	14.72	-	
3022514	2.5	14	50	3.7	2.4	4	14.75	15.32	15.87	16.47	17.11	-	
3022516	2.5	16	55	3.7	2.4	4	16.83	17.46	18.09	18.77	-	-	
3022518	2.5	18	55	3.7	2.4	4	18.91	19.6	20.31	21.07	-	-	
3022520	2.5	20	60	3.7	2.4	4	20.99	21.74	22.52	-	-	-	
3022525	2.5	25	70	3.7	2.4	4	26.17	27.09	28.06	-	-	-	
3022530	2.5	30	80	3.7	2.4	4	31.34	32.43	-	-	-	-	
3023008	3	8	45	4.5	2.85	6	8.42	8.79	9.13	9.47	9.84	10.24	
3023010	3	10	45	4.5	2.85	6	10.51	10.95	11.35	11.77	12.23	12.73	
3023012	3	12	45	4.5	2.85	6	12.6	13.09	13.56	14.07	14.62	15.21	
3023014	3	14	50	4.5	2.85	6	14.68	15.23	15.78	16.37	17.01	17.7	
3023016	3	16	55	4.5	2.85	6	16.76	17.37	18	18.67	19.41	20.19	
3023018	3	18	55	4.5	2.85	6	18.84	19.51	20.21	20.97	21.79	22.67	
3023020	3	20	60	4.5	2.85	6	20.91	21.65	22.43	23.27	24.18	25.16	
3023025	3	25	65	4.5	2.85	6	26.09	27	27.97	29.02	30.15	-	
3023030	3	30	80	4.5	2.85	6	31.26	32.35	33.51	34.77	-	-	
3023035	3	35	90	4.5	2.85	6	36.43	37.69	39.06	40.52	-	-	
3023040	3	40	90	4.5	2.85	6	41.59	43.04	44.6	-	-	-	
3024012	4	12	50	6	3.85	6	12.6	13.09	13.56	14.07	14.62	15.21	
3024016	4	16	60	6	3.85	6	16.76	17.37	18	18.67	19.4	-	
3024020	4	20	60	6	3.85	6	20.91	21.65	22.43	23.27	-	-	
3024025	4	25	70	6	3.85	6	26.09	27	27.97	-	-	-	
3024030	4	30	80	6	3.85	6	31.26	32.35	33.51	-	-	-	
3024035	4	35	90	6	3.85	6	36.43	37.69	-	-	-	-	
3024040	4	40	90	6	3.85	6	41.59	43.04	-	-	-	-	
3024045	4	45	100	6	3.85	6	46.76	48.39	-	-	-	-	
3024050	4	50	100	6	3.85	6	51.93	53.74	-	-	-	-	
3025016	5	16	60	7.5	4.85	6	16.76	17.37	18	-	-	-	
3025025	5	25	70	7.5	4.85	6	29.09	27	-	-	-	-	
3025035	5	35	90	7.5	4.85	6	36.43	-	-	-	-	-	
3025050	5	50	110	7.5	4.85	6	51.93	-	-	-	-	-	



OSG Europe : www.osgeurope.com

Applications - Anwendungen - Applicazioni - Applications													
WX-LN-EDS	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
		⊙	⊙	⊙	○		○	⊙	○	○		○	○

## Ball nose end mills - Kopierfräser - Frese sferiche - Fraises hémisphériques

\* HIGH PERFORMANCE

\* HIGH PERFORMANCE

\* ALTA PERFORMANCE

\* HAUTE PERFORMANCE

WX-EBD



P. 110-111

EDP	R	D	L	l	d	€
3015004	0.2	0.4	40	0.8	4	
3015005	0.25	0.5	40	1.1	4	
3015006	0.3	0.6	40	1.1	4	
3015008	0.4	0.8	40	2	4	
3015010	0.5	1	50	2.5	4	
3015012	0.6	1.2	50	3	4	
3015014	0.7	1.4	50	3.5	4	
3015015	0.75	1.5	50	4	4	
3015016	0.8	1.6	50	4	4	
3015020	1	2	50	5	6	
3015025	1.25	2.5	60	6	6	
3015030	1.5	3	60	8	6	
3015035	1.75	3.5	70	8	6	
3015040	2	4	70	8	6	
3015041	2	4	60	8	4	
3015050	2.5	5	80	10	6	
3015060	3	6	90	12	6	
3015070	3.5	7	90	14	6	
3015080	4	8	100	14	8	
3015090	4.5	9	100	18	8	
3015100	5	10	100	18	10	
3015110	5.5	11	100	22	10	
3015120	6	12	110	22	12	

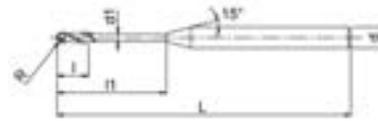
WX



WX-EBD	Applications - Anwendungen - Applicazioni - Applications												
	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
	⊙	⊙	⊙	○		⊙	⊙	○	○		○	○	

Ball nose end mills - Miniatur-Kopierfräser - Microfresa sferiche per nervature - Microfraises hémisphériques

\* HIGH PERFORMANCE \* HIGH PERFORMANCE \* ALTA PERFORMANCE \* HAUTE PERFORMANCE  
**WX-LN-EBD**



P. 92-95



EDP	R	l1	L	l	d1	d	α (Le)						€
							0.5°	1°	1.5°	2°	2.5°	3°	
3030201	0.1	0.5	45	0.16	0.18	4	0.55	0.6	0.66	0.73	0.81	0.9	
3030202	0.1	1	45	0.16	0.18	4	1.09	1.19	1.3	1.41	1.53	1.66	
3030203	0.1	1.5	45	0.16	0.18	4	1.64	1.78	1.92	2.07	2.22	2.37	
3030302	0.15	1	45	0.24	0.28	4	1.09	1.19	1.3	1.41	1.53	1.66	
3030303	0.15	1.5	45	0.24	0.28	4	1.64	1.78	1.92	2.07	2.22	2.37	
3030304	0.15	2	45	0.24	0.28	4	2.12	2.35	2.53	2.7	2.89	3.05	
3030402	0.2	1	45	0.3	0.37	4	1.09	1.18	1.29	1.39	1.51	1.63	
3030403	0.2	1.5	45	0.3	0.37	4	1.63	1.76	1.9	2.04	2.19	2.34	
3030404	0.2	2	45	0.3	0.37	4	2.17	2.34	2.51	2.68	2.85	3.02	
3030405	0.2	2.5	45	0.3	0.37	4	2.71	2.91	3.11	3.3	3.49	3.67	
3030406	0.2	3	45	0.3	0.37	4	3.24	3.48	3.7	3.91	4.12	4.32	
3030502	0.25	2	45	0.4	0.45	4	2.16	2.31	2.47	2.63	2.79	2.96	
3030503	0.25	3	45	0.4	0.45	4	3.23	3.44	3.65	3.86	4.06	4.25	
3030504	0.25	4	45	0.4	0.45	4	4.29	4.56	4.81	5.05	5.29	5.51	
3030505	0.25	5	45	0.4	0.45	4	5.36	5.67	5.96	6.23	6.49	6.75	
3030506	0.25	6	45	0.4	0.45	4	6.42	6.77	7.1	7.39	7.68	7.99	
3030508	0.25	8	45	0.4	0.45	4	8.53	8.96	9.34	9.69	10.07	10.48	
3030602	0.3	2	45	0.5	0.55	4	2.16	2.31	2.47	2.63	2.79	2.96	
3030603	0.3	3	45	0.5	0.55	4	3.23	3.44	3.65	3.86	4.06	4.25	
3030604	0.3	4	45	0.5	0.55	4	4.29	4.56	4.81	5.05	5.28	5.51	
3030605	0.3	5	45	0.5	0.55	4	5.36	5.67	5.96	6.23	6.49	6.75	
3030606	0.3	6	45	0.5	0.55	4	6.42	6.77	7.1	7.39	7.68	7.99	
3030608	0.3	8	45	0.5	0.55	4	8.53	8.96	9.34	9.69	10.07	10.48	
3030802	0.4	2	45	0.6	0.75	4	2.16	2.31	2.47	2.63	2.79	2.96	
3030804	0.4	4	45	0.6	0.75	4	4.29	4.56	4.81	5.05	5.28	5.51	
3030805	0.4	5	45	0.6	0.75	4	5.36	5.67	5.96	6.23	6.49	6.75	
3030806	0.4	6	45	0.6	0.75	4	6.42	6.77	7.1	7.39	7.68	7.99	
3030807	0.4	7	45	0.6	0.75	4	7.48	7.87	8.22	8.54	8.88	9.24	
3030808	0.4	8	45	0.6	0.75	4	8.53	8.96	9.34	9.69	10.07	10.48	
3030810	0.4	10	45	0.6	0.75	4	10.64	11.13	11.56	11.99	12.46	12.97	
3031003	0.5	3	45	0.8	0.95	4	3.23	3.44	3.65	3.86	4.06	4.25	
3031004	0.5	4	45	0.8	0.95	4	4.29	4.56	4.81	5.05	5.28	5.51	
3031005	0.5	5	45	0.8	0.95	4	5.36	5.67	5.96	6.23	6.49	6.75	
3031006	0.5	6	45	0.8	0.95	4	6.42	6.77	7.1	7.39	7.68	7.99	
3031007	0.5	7	45	0.8	0.95	4	7.48	7.87	8.22	8.54	8.88	9.24	
3031008	0.5	8	45	0.8	0.95	4	8.53	8.96	9.34	9.69	10.07	10.48	
3031009	0.5	9	45	0.8	0.95	4	9.59	10.05	10.45	10.84	11.27	11.72	
3031010	0.5	10	45	0.8	0.95	4	10.64	11.13	11.56	11.99	12.46	12.97	
3031012	0.5	12	45	0.8	0.95	4	12.74	13.29	13.78	14.29	14.85	15.45	
3031014	0.5	14	50	0.8	0.95	4	14.83	15.44	15.99	16.59	17.24	17.94	
3031016	0.5	16	50	0.8	0.95	4	16.92	17.58	18.21	18.89	19.63	20.43	
3031020	0.5	20	55	0.8	0.95	4	21.09	21.85	22.64	23.49	24.41	-	
3031206	0.6	6	45	1	1.15	4	6.42	6.77	7.1	7.39	7.68	7.99	
3031208	0.6	8	45	1	1.15	4	8.53	8.96	9.34	9.69	10.07	10.48	
3031210	0.6	10	45	1	1.15	4	10.64	11.13	11.56	11.99	12.46	12.97	
3031212	0.6	12	45	1	1.15	4	12.74	13.29	13.78	14.29	14.85	15.45	
3031408	0.7	8	45	1.1	1.35	4	8.53	8.96	9.34	9.69	10.07	10.48	
3031412	0.7	12	45	1.1	1.35	4	12.74	13.29	13.78	14.29	14.85	15.45	
3031416	0.7	16	50	1.1	1.35	4	16.92	17.58	18.21	18.89	19.63	20.43	
3031508	0.75	8	45	1.2	1.45	4	8.53	8.96	9.34	9.69	10.07	10.48	
3031512	0.75	12	45	1.2	1.45	4	12.74	13.29	13.78	14.29	14.85	15.45	
3031516	0.75	16	50	1.2	1.45	4	16.92	17.58	18.21	18.89	19.63	20.43	
3031520	0.75	20	55	1.2	1.45	4	21.09	21.85	22.64	23.49	24.41	-	



WX



## Ball nose end mills - Miniatur-Kopierfräser - Microfrese sferiche per nervature - Microfraises hémisphériques

WX-LN-EBD



EDP	R	l1	L	l	d1	d	$\alpha$ (Le)						€
							0.5°	1°	1.5°	2°	2.5°	3°	
3031608	0.8	8	45	1.3	1.55	4	8.53	8.96	9.34	9.69	10.07	10.48	
3031612	0.8	12	45	1.3	1.55	4	12.74	13.29	13.78	14.29	14.85	15.45	
3031616	0.8	16	50	1.3	1.55	4	16.92	17.58	18.21	18.89	19.63	20.43	
3031620	0.8	20	55	1.3	1.55	4	21.09	21.85	22.64	23.49	24.41	-	
3031808	0.9	8	45	1.4	1.75	4	8.53	8.96	9.34	9.69	10.07	10.48	
3031812	0.9	12	45	1.4	1.75	4	12.74	13.29	13.78	14.29	14.85	15.45	
3031816	0.9	16	50	1.4	1.75	4	16.92	17.58	18.21	18.89	19.63	20.43	
3031820	0.9	20	55	1.4	1.75	4	21.09	21.85	22.64	23.49	24.41	-	
3032004	1	4	45	1.6	1.95	4	4.29	4.56	4.81	5.06	5.28	5.51	
3032006	1	6	45	1.6	1.95	4	6.42	6.77	7.1	7.39	7.68	7.99	
3032008	1	8	45	1.6	1.95	4	8.53	8.96	9.34	9.69	10.07	10.48	
3032010	1	10	45	1.6	1.95	4	10.64	11.13	11.56	11.99	12.46	12.97	
3032012	1	12	45	1.6	1.95	4	12.74	13.29	13.78	14.29	14.85	15.45	
3032014	1	14	50	1.6	1.95	4	14.83	15.44	15.99	16.59	17.24	17.94	
3032016	1	16	50	1.6	1.95	4	16.92	17.58	18.21	18.89	19.63	20.43	
3032018	1	18	55	1.6	1.95	4	19.01	19.71	20.43	21.19	22.02	22.91	
3032020	1	20	55	1.6	1.95	4	21.09	21.85	22.64	23.49	-	-	
3032022	1	22	60	1.6	1.95	4	23.17	23.99	24.86	25.79	-	27.88	
3032025	1	25	65	1.6	1.95	4	26.28	27.2	28.19	-	-	31.61	
3032030	1	30	70	1.6	1.95	4	31.46	32.55	33.73	-	-	37.83	
3033008	1.5	8	50	2.4	2.85	6	8.42	8.79	9.13	9.74	9.84	10.24	
3033010	1.5	10	50	2.4	2.85	6	10.51	10.95	11.35	11.77	12.23	12.73	
3033016	1.5	16	55	2.4	2.85	6	16.76	17.37	18	18.67	19.4	20.19	
3033020	1.5	20	60	2.4	2.85	6	20.91	21.65	22.43	23.27	24.18	25.16	
3033025	1.5	25	65	2.4	2.85	6	26.09	27	27.97	29.02	30.15	-	
3033030	1.5	30	70	2.4	2.85	6	31.26	32.35	33.51	34.77	-	-	
3033035	1.5	35	80	2.4	2.85	6	36.43	37.69	39.06	40.52	-	-	
3034010	2	10	60	3.2	3.85	6	10.51	10.95	11.35	11.77	12.23	12.73	
3034016	2	16	60	3.2	3.85	6	16.76	17.37	18	18.67	19.4	20.19	
3034020	2	20	65	3.2	3.85	6	20.91	21.65	22.43	23.27	-	25.16	
3034025	2	25	70	3.2	3.85	6	26.09	27	27.97	-	-	-	
3034030	2	30	80	3.2	3.85	6	31.26	32.35	33.51	-	-	-	
3034035	2	35	80	3.2	3.85	6	36.43	37.69	-	-	-	-	
3034040	2	40	90	3.2	3.85	6	41.59	43.04	-	-	-	-	
3034045	2	45	90	3.2	3.85	6	46.76	48.39	-	-	-	-	
3034050	2	50	100	3.2	3.85	6	51.93	53.74	-	-	-	-	
3035020	2.5	20	70	4	4.85	6	20.91	21.65	-	-	-	-	
3035025	2.5	25	70	4	4.85	6	26.09	27	-	-	-	-	
3035030	2.5	30	80	4	4.85	6	31.26	-	-	-	-	-	
3035035	2.5	35	80	4	4.85	6	36.43	-	-	-	-	-	
3036030	3	30	80	4.8	5.85	6	-	-	-	-	-	-	
3036050	3	50	120	4.8	5.85	6	-	-	-	-	-	-	

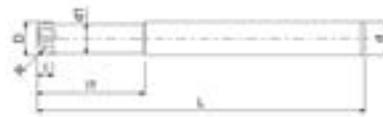
WX



WX-LN-EBD	Applications - Anwendungen - Applicazioni - Applications												
	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
	⊙	⊙	○	○		⊙	⊙	○	○		○	○	

Super radius end mills - Mehrschneider mit Eckenradius - Frese toriche - Fraises toriques

\* HIGH PERFORMANCE \* HIGH PERFORMANCE \* ALTA PERFORMANCE \* HAUTE PERFORMANCE  
**WX-HS-CRE**



EDP	D	R	L	l1	l	d1	d	€
3019867	6	1.5	50	24	2.5	5.4	6	
3019889	8	2	60	32	3.5	7.2	8	
3019909	10	2	70	40	4	9	10	
3019933	12	3	80	48	5	11	12	

\* HIGH PERFORMANCE \* HIGH PERFORMANCE \* ALTA PERFORMANCE \* HAUTE PERFORMANCE  
**WX-CRE**



WX



EDP	D	R	L	l1	l	d1	d	€
8549421	2	0.5	60	5	0.8	1.8	6	
8549433	3	0.75	60	7.5	1.2	2.7	6	
8549445	4	1	70	10	1.6	3.6	6	
8549457	5	1.2	80	12.5	2	4.5	6	
8549467	6	1.5	90	12	2.5	5.4	6	
8549477	7	1.5	90	-	3	-	6	
8549489	8	2	100	16	3.5	7.2	8	
8549499	9	2	100	-	4	-	8	
8549509	10	2	100	20	4	9	10	
8549519	11	2	100	-	4.5	-	10	
8549533	12	3	110	24	5	11	12	
8549543	13	3	110	-	5.5	-	12	

OSG Europe : www.osgeurope.com

Applications - Anwendungen - Applicazioni - Applications													
	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
WX-HS-CRE	☉	☉	☉	☉	○		☉						
WX-CRE	☉	☉	☉	☉	○		☉						

## Radius end mills - Mehrschneider mit Eckenradius - Frese toriche - Fraises à rayons

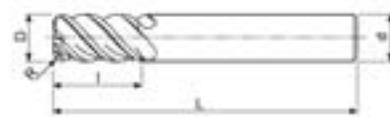
\* HIGH PERFORMANCE

\* HIGH PERFORMANCE

\* ALTA PERFORMANCE

\* HAUTE PERFORMANCE

WX-CR-PHS



0~ -0.02



P. 114



EDP	D	R	L	I	d	€
3016331	3	0.2	60	8	6	
3016333	3	0.5	60	8	6	
3016341	4	0.2	60	11	6	
3016343	4	0.5	60	11	6	
3016345	4	1	60	11	6	
3016351	5	0.2	60	13	6	
3016353	5	0.5	60	13	6	
3016355	5	1	60	13	6	
3016362	6	0.3	60	13	6	
3016363	6	0.5	60	13	6	
3016365	6	1	60	13	6	
3016382	8	0.3	80	19	8	
3016383	8	0.5	80	19	8	
3016385	8	1	80	19	8	
3016387	8	1.5	80	19	8	
3016389	8	2	80	19	8	
3016402	10	0.3	80	22	10	
3016403	10	0.5	80	22	10	
3016405	10	1	80	22	10	
3016407	10	1.5	80	22	10	
3016409	10	2	80	22	10	
3016413	10	3	80	22	10	
3016433	12	0.5	100	26	12	
3016435	12	1	100	26	12	
3016437	12	1.5	100	26	12	
3016439	12	2	100	26	12	
3016443	12	3	100	26	12	
3016462	16	1	115	32	16	
3016463	16	1.5	115	32	16	
3016464	16	2	115	32	16	
3016465	16	3	115	32	16	
3016482	20	1	125	38	20	
3016483	20	1.5	125	38	20	
3016484	20	2	125	38	20	
3016485	20	3	125	38	20	

WX



WX-CR-PHS	Applications		Anwendungen			Applicazioni		Applications					
	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
	⊙	⊙	○	○		⊙	⊙	○	○		⊙	⊙	

## Slotting end mills - 2 Schneiden Schafffräser - Frese per nervature - Fraises à rainurer

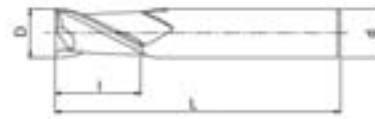
\* HIGH PERFORMANCE

\* HIGH PERFORMANCE

\* ALTA PERFORMANCE

\* HAUTE PERFORMANCE

FX-MG-EDSS

D ≤ 12  
0~0.0212 < D  
0~0.03

P. 102



EDP	D	L	l	d	€
8407630	3	50	4.5	6	
8407635	3.5	50	5.2	6	
8407640	4	50	6	6	
8407645	4.5	50	6.8	6	
8407650	5	50	7.5	6	
8407655	5.5	50	8.2	6	
8407660	6	50	9	6	
8407680	8	60	12	8	
8407700	10	70	15	10	
8407720	12	75	18	12	
8407740	14	85	21	16	
8407750	15	90	23	16	
8407760	16	100	24	16	

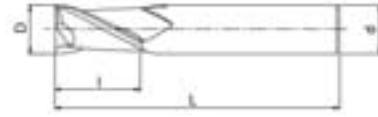
FX



FX-MG-EDSS	Applications - Anwendungen - Applicazioni - Applications													
	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.	
	⊙	⊙	○	○		○	⊙	○	○		○	○		

## Slotting end mills - 2 Schneiden Schafffräser - Frese per nervature - Fraises à rainurer

FX-MG-EDS



P. 102



EDP	D	L	l	d	€
8519002	0.2	40	0.4	3	
8519003	0.3	40	0.6	3	
8519004	0.4	40	0.8	3	
8519005	0.5	40	1	3	
8519006	0.6	40	1.2	3	
8519007	0.7	40	1.4	3	
8519008	0.8	40	1.6	3	
8519009	0.9	40	2	3	
8519010	1	40	2.5	4	
8519011	1.1	40	2.5	4	
8519012	1.2	40	4	4	
8519013	1.3	40	4	4	
8519014	1.4	40	4	4	
8519015	1.5	40	4	4	
8519016	1.6	40	5	4	
8519017	1.7	40	5	4	
8519018	1.8	40	5	4	
8519019	1.9	40	5	4	
8519020	2	40	6	4	
8519021	2.1	40	6	4	
8519022	2.2	40	6	4	
8519023	2.3	40	6	4	
8519024	2.4	40	8	4	
8519025	2.5	40	8	4	
8519026	2.6	40	8	4	
8519027	2.7	40	8	4	
8519028	2.8	40	8	4	
8519029	2.9	40	8	4	
8519030	3	45	8	6	
8519031	3.1	45	10	6	
8519032	3.2	45	10	6	
8519033	3.3	45	10	6	
8519034	3.4	45	10	6	
8519035	3.5	45	10	6	
8519036	3.6	45	10	6	
8519037	3.7	45	10	6	
8519038	3.8	45	11	6	
8519039	3.9	45	11	6	
8519040	4	45	11	6	
8519041	4.1	45	11	6	
8519042	4.2	45	11	6	
8519043	4.3	45	11	6	
8519044	4.4	45	11	6	
8519045	4.5	45	11	6	
8519046	4.6	45	11	6	
8519047	4.7	45	11	6	
8519048	4.8	50	13	6	
8519049	4.9	50	13	6	
8519050	5	50	13	6	
8519051	5.1	50	13	6	
8519052	5.2	50	13	6	
8519053	5.3	50	13	6	
8519054	5.4	50	13	6	
8519055	5.5	50	13	6	
8519056	5.6	50	13	6	
8519057	5.7	50	13	6	
8519058	5.8	50	13	6	

EDP	D	L	l	d	€
8519059	5.9	50	13	6	
8519060	6	50	13	6	
8519061	6.1	60	16	8	
8519062	6.2	60	16	8	
8519063	6.3	60	16	8	
8519064	6.4	60	16	8	
8519065	6.5	60	16	8	
8519066	6.6	60	16	8	
8519067	6.7	60	16	8	
8519068	6.8	60	16	8	
8519069	6.9	60	16	8	
8519070	7	60	16	8	
8519071	7.1	60	16	8	
8519072	7.2	60	16	8	
8519073	7.3	60	16	8	
8519074	7.4	60	16	8	
8519075	7.5	60	16	8	
8519076	7.6	60	19	8	
8519077	7.7	60	19	8	
8519078	7.8	60	19	8	
8519079	7.9	60	19	8	
8519080	8	60	19	8	
8519081	8.1	70	19	10	
8519082	8.2	70	19	10	
8519083	8.3	70	19	10	
8519084	8.4	70	19	10	
8519085	8.5	70	19	10	
8519086	8.6	70	19	10	
8519087	8.7	70	19	10	
8519088	8.8	70	19	10	
8519089	8.9	70	19	10	
8519090	9	70	19	10	
8519091	9.1	70	19	10	
8519092	9.2	70	19	10	
8519093	9.3	70	19	10	
8519094	9.4	70	19	10	
8519095	9.5	70	19	10	
8519096	9.6	70	22	10	
8519097	9.7	70	22	10	
8519098	9.8	70	22	10	
8519099	9.9	70	22	10	
8519100	10	70	22	10	
8519101	10.1	75	22	12	
8519102	10.2	75	22	12	
8519103	10.3	75	22	12	
8519104	10.4	75	22	12	
8519105	10.5	75	22	12	
8519106	10.6	75	22	12	
8519107	10.7	75	22	12	
8519108	10.8	75	22	12	
8519109	10.9	75	22	12	
8519110	11	75	22	12	
8519111	11.1	75	22	12	
8519112	11.2	75	22	12	
8519113	11.3	75	22	12	
8519114	11.4	75	22	12	
8519115	11.5	75	22	12	

FX



## Slotting end mills - 2 Schneiden Schafffräser - Frese per nervature - Fraises à rainurer

FX-MG-EDS



EDP	D	L	l	d	€
8519116	11.6	75	22	12	
8519117	11.7	75	22	12	
8519118	11.8	75	22	12	
8519119	11.9	75	26	12	
8519120	12	75	26	12	
8519121	12.1	85	26	12	
8519122	12.2	85	26	12	
8519123	12.3	85	26	12	
8519124	12.4	85	26	12	
8519125	12.5	85	26	12	
8519126	12.6	85	26	12	
8519127	12.7	85	26	12	
8519128	12.8	85	26	12	
8519129	12.9	85	26	12	
8519130	13	85	26	12	
8519131	13.1	85	26	12	
8519132	13.2	85	26	12	
8519133	13.3	85	26	12	
8519134	13.4	85	26	12	
8519135	13.5	85	26	12	
8519136	13.6	85	26	12	
8519137	13.7	85	26	12	
8519138	13.8	85	26	12	
8519139	13.9	85	26	12	
8519140	14	85	26	12	
8519141	14.1	90	26	16	
8519142	14.2	90	26	16	
8519143	14.3	90	26	16	
8519144	14.4	90	26	16	
8519145	14.5	90	26	16	
8519146	14.6	90	26	16	
8519147	14.7	90	26	16	
8519148	14.8	90	26	16	
8519149	14.9	90	26	16	
8519150	15	90	26	16	
8519151	15.1	100	32	16	
8519152	15.2	100	32	16	
8519153	15.3	100	32	16	
8519154	15.4	100	32	16	
8519155	15.5	100	32	16	
8519156	15.6	100	32	16	
8519157	15.7	100	32	16	
8519158	15.8	100	32	16	
8519159	15.9	100	32	16	
8519160	16	100	32	16	
8519161	16.1	100	32	16	
8519162	16.2	100	32	16	
8519163	16.3	100	32	16	

EDP	D	L	l	d	€
8519164	16.4	100	32	16	
8519165	16.5	100	32	16	
8519166	16.6	100	32	16	
8519167	16.7	100	32	16	
8519168	16.8	100	32	16	
8519169	16.9	100	32	16	
8519170	17	100	32	16	
8519171	17.1	100	32	16	
8519172	17.2	100	32	16	
8519173	17.3	100	32	16	
8519174	17.4	100	32	16	
8519175	17.5	100	32	16	
8519176	17.6	100	32	16	
8519177	17.7	100	32	16	
8519178	17.8	100	32	16	
8519179	17.9	100	32	16	
8519180	18	100	32	16	
8519181	18.1	100	32	20	
8519182	18.2	100	32	20	
8519183	18.3	100	32	20	
8519184	18.4	100	32	20	
8519185	18.5	100	32	20	
8519186	18.6	100	32	20	
8519187	18.7	100	32	20	
8519188	18.8	100	32	20	
8519189	18.9	100	32	20	
8519190	19	100	32	20	
8519191	19.1	105	38	20	
8519192	19.2	105	38	20	
8519193	19.3	105	38	20	
8519194	19.4	105	38	20	
8519195	19.5	105	38	20	
8519196	19.6	105	38	20	
8519197	19.7	105	38	20	
8519198	19.8	105	38	20	
8519199	19.9	105	38	20	
8519200	20	105	38	20	
8519210	21	105	38	20	
8519220	22	105	38	20	
8519230	23	120	45	25	
8519240	24	120	45	25	
8519250	25	120	45	25	
8519260	26	120	45	25	
8519270	27	125	45	25	
8519280	28	125	45	25	
8519290	29	125	45	32	
8519300	30	125	45	32	

FX

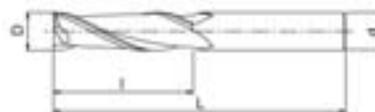


FX-MG-EDS	Applications - Anwendungen - Applicazioni - Applications													
	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.	
	☉	☉	○	○		○	☉	○	○		○	○		

Slotting end mills - 2 Schneiden Schafffräser - Frese per nervature - Fraises à rainurer



\* HIGH PERFORMANCE \* HIGH PERFORMANCE \* ALTA PERFORMANCE \* HAUTE PERFORMANCE  
**FX-MG-EDL**



0~-0.03



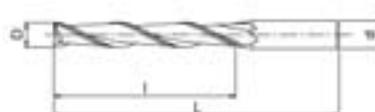
EDP	D	L	l	d	€
8522010	1	50	4	4	
8522015	1.5	50	6	4	
8522020	2	50	9	4	
8522025	2.5	50	12	4	
8522030	3	50	12	6	
8522035	3.5	50	14	6	
8522040	4	50	17	6	
8522045	4.5	50	17	6	
8522050	5	60	20	6	
8522055	5.5	60	20	6	
8522060	6	60	20	6	
8522065	6.5	70	24	8	
8522070	7	70	24	8	
8522075	7.5	70	24	8	
8522080	8	70	28	8	
8522085	8.5	80	28	10	
8522090	9	80	28	10	
8522095	9.5	80	28	10	
8522100	10	80	34	10	
8522105	10.5	90	34	12	
8522110	11	90	34	12	

EDP	D	L	l	d	€
8522115	11.5	90	34	12	
8522120	12	90	40	12	
8522130	13	100	40	12	
8522140	14	100	40	12	
8522150	15	105	40	16	
8522160	16	115	48	16	
8522170	17	115	48	16	
8522180	18	115	48	16	
8522190	19	115	48	20	
8522200	20	125	56	20	
8522210	21	125	56	20	
8522220	22	125	56	20	
8522230	23	140	67	25	
8522240	24	140	67	25	
8522250	25	140	67	25	
8522260	26	140	67	25	
8522270	27	145	67	25	
8522280	28	145	67	25	
8522290	29	145	67	32	
8522300	30	145	67	32	

FX



\* HIGH PERFORMANCE \* HIGH PERFORMANCE \* ALTA PERFORMANCE \* HAUTE PERFORMANCE  
**FX-MG-EXDL**



0~-0.03



EDP	D	L	l	d	€
8542830	3	60	20	6	
8542840	4	70	32	6	
8542850	5	80	40	6	
8542860	6	80	40	6	
8542880	8	110	63	8	
8542900	10	125	75	10	
8542920	12	150	90	12	
8542930	13	160	95	16	
8542940	14	160	95	16	
8542950	15	160	95	16	

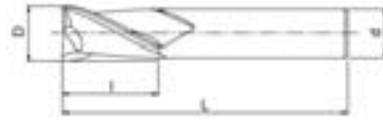
EDP	D	L	l	d	€
8542960	16	160	95	16	
8542970	17	180	95	20	
8542980	18	180	95	20	
8542990	19	180	95	20	
8543000	20	180	100	20	
8543020	22	200	106	25	
8543040	24	200	106	25	
8543050	25	200	106	25	
8543100	30	225	112	32	

OSG Europe : www.osgeurope.com

Applications - Anwendungen - Applicazioni - Applications													
	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
FX-MG-EDL	⊙	⊙	○			○	⊙	○	○		○	○	
FX-MG-EXDL	⊙	⊙	⊙	○		○	⊙	○	○		○	○	

Slotting end mills - 2 Schneiden Schafffräser - Frese per nervature - Fraises à rainurer

\* HIGH PERFORMANCE \* HIGH PERFORMANCE \* ALTA PERFORMANCE \* HAUTE PERFORMANCE  
**FX-SS-EDS**



EDP	D	L	l	d	€
8408456	6	90	15	5	
8408458	8	100	20	7	
8408460	10	100	25	9	
8408462	12	110	30	11	

\* HIGH PERFORMANCE \* HIGH PERFORMANCE \* ALTA PERFORMANCE \* HAUTE PERFORMANCE  
**FX-EDS-6**



FX



EDP	D	l1	L	l	d1	d	$\alpha$ (Le)						€
							0.5°	1°	1.5°	2°	2.5°	3°	
8544102	0.2	-	50	0.3	-	6	-	-	-	-	-	-	
8544103	0.3	-	50	0.4	-	6	-	-	-	-	-	-	
8544104	0.4	-	50	0.6	-	6	-	-	-	-	-	-	
8544105	0.5	1.5	50	0.7	0.45	6	1.55	1.6	1.66	1.72	1.79	1.86	
8544106	0.6	1.8	50	0.9	0.55	6	1.86	1.92	1.99	2.07	2.15	2.23	
8544108	0.8	2.4	50	1.2	0.75	6	2.48	2.56	2.66	2.76	2.86	2.98	
8544110	1	2.5	50	1.5	0.95	6	2.58	2.67	2.77	2.87	2.98	3.1	
8544112	1.2	3	50	1.8	1.15	6	3.1	3.2	3.32	3.45	3.58	3.72	
8544114	1.4	3.5	50	2.1	1.35	6	3.61	3.74	3.87	4.02	4.18	4.35	
8544115	1.5	3.8	50	2.3	1.45	6	3.92	4.06	4.21	4.36	4.54	4.72	
8544116	1.6	4	50	2.4	1.55	6	4.13	4.27	4.43	4.59	4.77	4.97	
8544118	1.8	4.5	50	2.7	1.75	6	4.65	4.81	4.98	5.17	5.37	5.59	
8544120	2	5	50	3	1.95	6	5.16	5.34	5.54	5.74	5.97	6.21	
8544125	2.5	5	50	3.7	2.4	6	5.16	5.34	5.54	5.74	5.97	6.21	

	Applications - Anwendungen - Applicazioni - Applications													
	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.	
<b>FX-SS-EDS</b>	⊙	⊙	○	○		○	⊙	○	○		○	○		
<b>FX-EDS-6</b>	⊙	⊙	⊙	○		○	⊙	○	○		○	○		

## Slotting end mills - Miniatur-Schaftfräser - Microfresa per nervature - Microfraises à rainurer



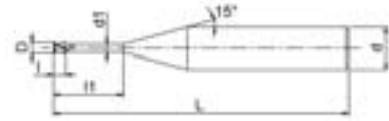
\* HIGH PERFORMANCE

\* HIGH PERFORMANCE

\* ALTA PERFORMANCE

\* HAUTE PERFORMANCE

FX-LN-EDS-6



EDP	D	l1	L	l	d1	d	$\alpha$ (Le)						€
							0.5°	1°	1.5°	2°	2.5°	3°	
8544205	0.5	2.5	60	0.7	0.45	6	2.58	2.67	2.77	2.87	2.98	3.1	
8544206	0.6	3	60	0.9	0.55	6	3.1	3.2	3.32	3.45	3.58	3.72	
8544208	0.8	4	60	1.2	0.75	6	4.13	4.27	4.43	4.59	4.77	4.97	
8544210	1	5	60	1.5	0.95	6	5.16	5.34	5.54	5.74	5.97	6.21	
8544212	1.2	6	60	1.8	1.15	6	6.2	6.41	6.65	6.89	7.16	7.45	
8544214	1.4	7	60	2.1	1.35	6	7.23	7.48	7.75	8.04	8.36	8.7	
8544215	1.5	7.5	60	2.3	1.45	6	7.75	8.02	8.31	8.62	8.96	9.32	
8544216	1.6	8	60	2.4	1.55	6	8.26	8.55	8.86	9.19	9.55	9.94	
8544218	1.8	9	60	2.7	1.75	6	9.3	9.62	9.97	10.35	10.75	11.19	
8544220	2	10	60	3	1.95	6	10.34	10.7	11.08	11.5	11.95	12.43	
8544225	2.5	12.5	60	3.7	2.4	6	12.92	13.37	13.85	14.37	14.93	15.54	

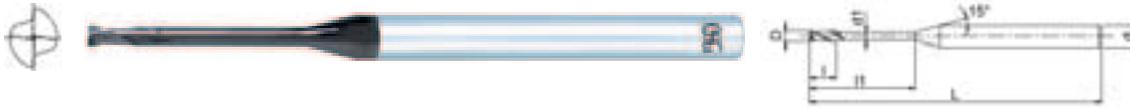
FX



Applications - Anwendungen - Applicazioni - Applications													
FX-LN-EDS-6	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
	☉	☉	☉	○		○	☉	○	○		○	○	

Slotting end mills - Miniatur-Schafffräser - Microfresa per nervature - Microfraises à rainurer

\* HIGH PERFORMANCE    \* HIGH PERFORMANCE    \* ALTA PERFORMANCE    \* HAUTE PERFORMANCE  
**FX-RB-EGS**



EDP	D	l1	L	l	d1	d	€
8538050	0.5	2	35	0.7	0.45	3	
8538051	0.5	4	35	0.7	0.45	3	
8538052	0.5	6	35	0.7	0.45	3	
8538060	0.6	2	35	0.9	0.55	3	
8538061	0.6	4	35	0.9	0.55	3	
8538062	0.6	6	35	0.9	0.55	3	
8538070	0.7	2	45	1	0.65	4	
8538071	0.7	4	45	1	0.65	4	
8538072	0.7	6	45	1	0.65	4	
8538081	0.8	4	45	1.2	0.75	4	
8538082	0.8	6	45	1.2	0.75	4	
8538083	0.8	8	45	1.2	0.75	4	
8538092	0.9	6	45	1.35	0.85	4	
8538093	0.9	8	45	1.35	0.85	4	
8538094	0.9	10	45	1.35	0.85	4	
8538102	1	6	45	1.5	0.97	4	
8538103	1	8	45	1.5	0.95	4	
8538104	1	10	45	1.5	0.95	4	
8538105	1	12	45	1.5	0.93	4	
8538122	1.2	6	45	1.8	1.17	4	
8538123	1.2	8	45	1.8	1.15	4	
8538124	1.2	10	45	1.8	1.15	4	
8538125	1.2	12	45	1.8	1.13	4	
8538142	1.4	6	45	2.1	1.37	4	
8538143	1.4	8	45	2.1	1.35	4	
8538144	1.4	10	45	2.1	1.35	4	
8538145	1.4	12	45	2.1	1.33	4	
8538146	1.4	14	50	2.1	1.33	4	
8538147	1.4	16	50	2.1	1.31	4	
8538152	1.5	6	45	2.3	1.47	4	
8538153	1.5	8	45	2.3	1.45	4	
8538154	1.5	10	45	2.3	1.45	4	
8538155	1.5	12	45	2.3	1.43	4	
8538156	1.5	14	50	2.3	1.43	4	
8538157	1.5	16	50	2.3	1.41	4	
8538158	1.5	18	55	2.3	1.41	4	
8538159	1.5	20	55	2.3	1.39	4	
8538162	1.6	6	45	2.4	1.57	4	
8538163	1.6	8	45	2.4	1.55	4	
8538164	1.6	10	45	2.4	1.55	4	
8538165	1.6	12	45	2.4	1.53	4	
8538166	1.6	14	50	2.4	1.53	4	
8538167	1.6	16	50	2.4	1.51	4	
8538168	1.6	18	55	2.4	1.51	4	
8538169	1.6	20	55	2.4	1.49	4	
8538172	1.7	6	45	2.6	1.67	4	
8538173	1.7	8	45	2.6	1.65	4	
8538174	1.7	10	45	2.6	1.65	4	
8538175	1.7	12	45	2.6	1.63	4	

EDP	D	l1	L	l	d1	d	€
8538176	1.7	14	50	2.6	1.63	4	
8538177	1.7	16	50	2.6	1.61	4	
8538178	1.7	18	55	2.6	1.61	4	
8538179	1.7	20	55	2.6	1.59	4	
8538182	1.8	6	45	2.7	1.77	4	
8538183	1.8	8	45	2.7	1.75	4	
8538184	1.8	10	45	2.7	1.75	4	
8538185	1.8	12	45	2.7	1.73	4	
8538186	1.8	14	50	2.7	1.73	4	
8538187	1.8	16	50	2.7	1.71	4	
8538188	1.8	18	55	2.7	1.71	4	
8538189	1.8	20	55	2.7	1.69	4	
8538192	1.9	6	45	2.8	1.87	4	
8538193	1.9	8	45	2.8	1.85	4	
8538194	1.9	10	45	2.8	1.85	4	
8538195	1.9	12	45	2.8	1.83	4	
8538196	1.9	14	50	2.8	1.83	4	
8538197	1.9	16	50	2.8	1.81	4	
8538198	1.9	18	55	2.8	1.81	4	
8538199	1.9	20	55	2.8	1.79	4	
8538202	2	6	45	3	1.97	4	
8538203	2	8	45	3	1.95	4	
8538204	2	10	45	3	1.95	4	
8538205	2	12	45	3	1.93	4	
8538206	2	14	50	3	1.93	4	
8538207	2	16	50	3	1.91	4	
8538208	2	18	55	3	1.91	4	
8538209	2	20	55	3	1.89	4	
8538210	2	25	60	3	1.89	4	
8538211	2	30	70	3	1.89	4	
8538253	2.5	8	45	3.7	2.4	4	
8538254	2.5	10	45	3.7	2.4	4	
8538255	2.5	12	45	3.7	2.4	4	
8538256	2.5	14	50	3.7	2.4	4	
8538257	2.5	16	55	3.7	2.4	4	
8538258	2.5	18	55	3.7	2.4	4	
8538259	2.5	20	60	3.7	2.4	4	
8538260	2.5	25	70	3.7	2.4	4	
8538261	2.5	30	80	3.7	2.4	4	
8538303	3	8	45	4.5	2.85	6	
8538304	3	10	45	4.5	2.85	6	
8538305	3	12	45	4.5	2.85	6	
8538306	3	14	50	4.5	2.85	6	
8538307	3	16	55	4.5	2.85	6	
8538308	3	18	55	4.5	2.85	6	
8538309	3	20	60	4.5	2.85	6	
8538310	3	25	65	4.5	2.85	6	
8538311	3	30	80	4.5	2.85	6	
8538312	3	40	90	4.5	2.85	6	

FX



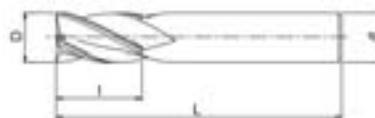
OSG Europe : www.osgeurope.com

FX-RB-EGS	Applications - Anwendungen - Applicazioni - Applications													
	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.	
	⊙	⊙	○	○		○	⊙	○	○		○			

Multiflute end mills - Mehrschneider - Fresa multidenti - Fraises multilèvres



\* HIGH PERFORMANCE \* HIGH PERFORMANCE \* ALTA PERFORMANCE \* HAUTE PERFORMANCE  
**FX-MG-EMSS**



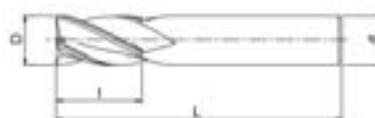
P. 104-105

EDP	D	L	l	d	€
8408030	3	50	4.5	6	
8408035	3.5	50	5.2	6	
8408040	4	50	6	6	
8408045	4.5	50	6.8	6	
8408050	5	50	7.5	6	
8408055	5.5	50	8.2	6	
8408060	6	50	9	6	

EDP	D	L	l	d	€
8408080	8	60	12	8	
8408100	10	70	15	10	
8408120	12	75	18	12	
8408140	14	85	21	16	
8408150	15	90	23	16	
8408160	16	100	24	16	

\* HIGH PERFORMANCE \* HIGH PERFORMANCE \* ALTA PERFORMANCE \* HAUTE PERFORMANCE  
**FX-MG-EMS**

FX



P. 104-105

EDP	D	L	l	d	€
8520020	2	40	6	4	
8520025	2.5	40	8	4	
8520030	3	45	8	6	
8520035	3.5	45	10	6	
8520040	4	45	11	6	
8520045	4.5	45	11	6	
8520050	5	50	13	6	
8520055	5.5	50	13	6	
8520060	6	50	13	6	
8520065	6.5	60	16	8	
8520070	7	60	16	8	
8520075	7.5	60	16	8	
8520080	8	60	19	8	
8520085	8.5	70	19	10	
8520090	9	70	19	10	
8520095	9.5	70	19	10	
8520100	10	70	22	10	
8520105	10.5	75	22	12	
8520110	11	75	22	12	
8520115	11.5	75	22	12	

EDP	D	L	l	d	€
8520120	12	75	26	12	
8520125	12.5	85	26	12	
8520130	13	85	26	12	
8520140	14	85	26	12	
8520150	15	90	26	16	
8520160	16	100	32	16	
8520170	17	100	32	16	
8520180	18	100	32	16	
8520190	19	100	32	20	
8520200	20	105	38	20	
8520210	21	105	38	20	
8520220	22	105	38	20	
8520230	23	120	45	25	
8520240	24	120	45	25	
8520250	25	120	45	25	
8520260	26	120	45	25	
8520270	27	125	45	25	
8520280	28	125	45	25	
8520290	29	125	45	32	
8520300	30	125	45	32	

OSG Europe : www.osgeurope.com

	Applications		Anwendungen			Applicazioni		Applications					
<b>FX-MG-EMSS</b>	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
	⊙	⊙	○	○		○	⊙	○	○		○	○	
<b>FX-MG-EMS</b>	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
	⊙	⊙	○	○		○	⊙	○	○		○	○	

Multiflute end mills - Mehrschneider - Fresa multidenti - Fraises multilèvres

\* HIGH PERFORMANCE \* HIGH PERFORMANCE \* ALTA PERFORMANCE \* HAUTE PERFORMANCE  
**FX-MG-EML**



EDP	D	L	l	d	€
8523030	3	50	12	6	
8523035	3.5	50	14	6	
8523040	4	50	17	6	
8523045	4.5	50	17	6	
8523050	5	60	20	6	
8523055	5.5	60	20	6	
8523060	6	60	20	6	
8523065	6.5	70	24	8	
8523070	7	70	24	8	
8523075	7.5	70	24	8	
8523080	8	70	28	8	
8523085	8.5	80	28	10	
8523090	9	80	28	10	
8523095	9.5	80	28	10	
8523100	10	80	34	10	
8523105	10.5	90	34	12	
8523110	11	90	34	12	
8523115	11.5	90	34	12	
8523120	12	90	40	12	

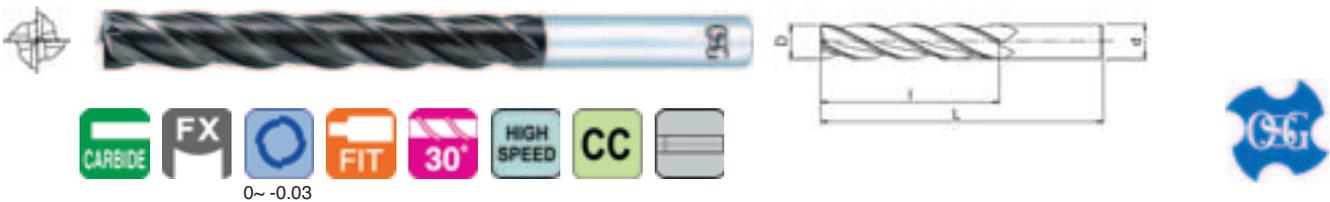
EDP	D	L	l	d	€
8523130	13	100	40	12	
8523140	14	100	40	12	
8523150	15	105	40	16	
8523160	16	115	48	16	
8523170	17	115	48	16	
8523180	18	115	48	16	
8523190	19	115	48	20	
8523200	20	125	56	20	
8523210	21	125	56	20	
8523220	22	125	56	20	
8523230	23	140	67	25	
8523240	24	140	67	25	
8523250	25	140	67	25	
8523260	26	140	67	25	
8523270	27	145	67	25	
8523280	28	145	67	25	
8523290	29	145	67	32	
8523300	30	145	67	32	



FX



\* HIGH PERFORMANCE \* HIGH PERFORMANCE \* ALTA PERFORMANCE \* HAUTE PERFORMANCE  
**FX-MG-EXML**



EDP	D	L	l	d	€
8543330	3	60	20	6	
8543340	4	70	32	6	
8543350	5	80	40	6	
8543360	6	80	40	6	
8543380	8	110	63	8	
8543400	10	125	75	10	
8543420	12	150	90	12	
8543430	13	160	95	16	
8543440	14	160	95	16	
8543450	15	160	95	16	

EDP	D	L	l	d	€
8543460	16	160	95	16	
8543470	17	180	95	20	
8543480	18	180	95	20	
8543490	19	180	100	20	
8543500	20	180	100	20	
8543520	22	200	106	25	
8543540	24	200	106	25	
8543550	25	200	106	25	
8543600	30	225	112	32	

OSG Europe : www.osgeurope.com

		Applications		Anwendungen		Applicazioni		Applications					
FX-MG-EML	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
		⊙	⊙	○			○	⊙	○	○		○	○
FX-MG-EXML	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
		⊙	⊙				○	⊙	○		○		

Multiflute end mills - Mehrschneider - Fresa multidenti - Fraises multilèvres



\* HIGH PERFORMANCE \* HIGH PERFORMANCE \* ALTA PERFORMANCE \* HAUTE PERFORMANCE  
**FX-SS-EMS**

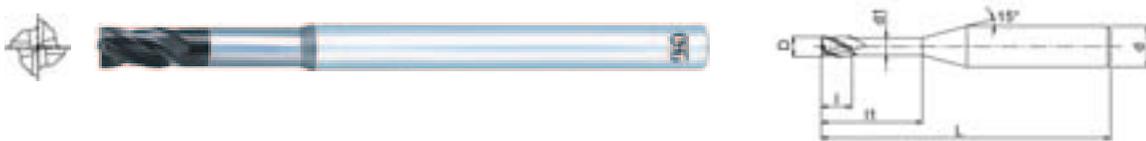


P. 104-105

EDP	D	L	l	d	€
8408506	6	90	15	5	
8408508	8	100	20	7	
8408510	10	100	25	9	
8408512	12	110	30	11	

\* HIGH PERFORMANCE \* HIGH PERFORMANCE \* ALTA PERFORMANCE \* HAUTE PERFORMANCE  
**FX-LN-EMS-6**

FX



P. 125

EDP	D	l1	L	l	d1	d	α (Le)						€
							0.5°	1°	1.5°	2°	2.5°	3°	
8544310	1	5	60	1.5	0.95	6	5.16	5.34	5.54	5.74	5.97	6.21	
8544312	1.2	6	60	1.8	1.15	6	6.2	6.41	6.65	6.89	7.16	7.45	
8544315	1.5	7.5	60	2.3	1.45	6	7.75	8.02	8.31	8.62	8.96	9.32	
8544320	2	10	60	3	1.95	6	10.34	10.7	11.08	11.5	11.95	12.43	
8544325	2.5	12.5	60	3.7	2.4	6	12.92	13.37	13.85	14.37	14.93	15.54	
8544330	3	15	70	4.5	2.85	6	15.5	16.05	16.62	17.25	17.92	18.65	
8544335	3.5	17.5	70	5.3	3.35	6	18.09	18.72	19.4	20.12	20.91	21.76	
8544340	4	20	70	6	3.85	6	20.67	21.39	22.17	23	-	-	
8544350	5	25	80	7.5	4.85	6	25.84	26.74	-	-	-	-	
8544360	6	30	90	9	5.85	6	-	-	-	-	-	-	

OSG Europe : www.osgeurope.com

Applications - Anwendungen - Applicazioni - Applications													
FX-SS-EMS	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
	⊙	⊙	○	○		○	⊙	○	○		○	○	
FX-LN-EMS-6	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
	⊙	⊙	⊙	○		○	⊙	○	○		○	○	

Multiflute end mills - Mehrschneider - Fresa multidenti - Fraises multilèvres

\* **HIGH PERFORMANCE**  
\* Good chip ejection

\* For difficult milling materials

\* **HIGH PERFORMANCE**  
\* Optimale Spanabfuhr

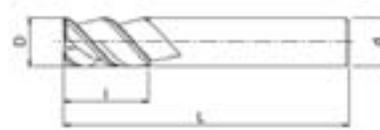
\* Für schwer zerspanbare Werkstoffe

\* **ALTA PERFORMANCE**  
\* Per una migliore evacuazione del truciolo  
\* Per materiali difficili da lavorare

\* **HAUTE PERFORMANCE**  
\* Bonne éjection du copeau  
\* Pour matières difficiles à usiner



**FX-MG-EHS**



EDP	D	L	l	d	n <sub>Δ</sub>	€
8542130	3	50	8	6	3	
8542430	3	50	8	6	4	
8542140	4	50	11	6	3	
8542440	4	50	11	6	4	
8542150	5	50	13	6	3	
8542450	5	50	13	6	4	
8542160	6	50	13	6	3	
8542460	6	50	13	6	4	
8542170	7	60	16	8	3	
8542180	8	60	19	8	3	
8542480	8	60	19	8	4	
8542190	9	70	19	10	3	
8542200	10	70	22	10	3	
8542500	10	70	22	10	4	
8542210	11	75	22	12	3	
8542220	12	75	26	12	3	

EDP	D	L	l	d	n <sub>Δ</sub>	€
8542520	12	75	26	12	4	
8542230	13	90	26	16	3	
8542240	14	90	26	16	3	
8542540	14	90	26	16	4	
8542250	15	90	26	16	3	
8542550	15	90	26	16	4	
8542260	16	100	32	16	3	
8542560	16	100	32	16	4	
8542280	18	100	32	20	3	
8542580	18	100	32	20	4	
8542300	20	105	38	20	3	
8542600	20	105	38	20	4	
8542350	25	120	45	25	3	
8542650	25	120	45	25	4	

Δ number of flutes - Anzahl Schneiden - numero di denti - nombre de lèvres

**FX**



\* **HIGH PERFORMANCE**  
\* Good chip ejection

\* For difficult milling materials

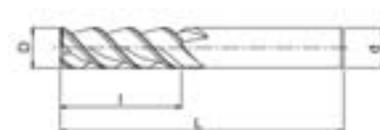
\* **HIGH PERFORMANCE**  
\* Optimale Spanabfuhr

\* Für schwer zerspanbare Werkstoffe

\* **ALTA PERFORMANCE**  
\* Per una migliore evacuazione del truciolo  
\* Per materiali difficili da lavorare

\* **HAUTE PERFORMANCE**  
\* Bonne éjection du copeau  
\* Pour matières difficiles à usiner

**FX-MG-EHL**



EDP	D	L	l	d	n <sub>Δ</sub>	€
8408406	6	60	20	6	3	
8408408	8	70	28	8	3	
8408410	10	80	34	10	3	

EDP	D	L	l	d	n <sub>Δ</sub>	€
8408412	12	90	40	12	3	

Δ number of flutes - Anzahl Schneiden - numero di denti - nombre de lèvres

		Applications - Anwendungen - Applicazioni - Applications												
		~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
<b>FX-MG-EHS</b>		⊙	⊙	○	○		⊙	⊙	○	○		⊙	⊙	
<b>FX-MG-EHL</b>		⊙	⊙	○			⊙	⊙	○	○		⊙	⊙	

## Roughing end mills - Schruppfräser - Frese a sgrossare - Fraises ébauches



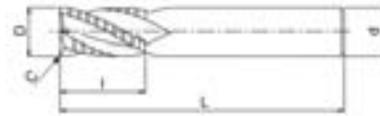
\* **HIGH PERFORMANCE**  
 \* For heavy duty operation  
 \* Chamfer C : D6 = 0.3,  
 D8~20 = 0.5

\* **HIGH PERFORMANCE**  
 \* Für Schwerzerspannung  
 \* Eckenradius C : D6 = 0.3,  
 D8~20 = 0.5

\* **ALTA PERFORMANCE**  
 \* Per lavorazione difficile  
 \* Smusso C : D6 = 0.3,  
 D8~20 = 0.5

\* **HAUTE PERFORMANCE**  
 \* Pour opération difficile  
 \* Chanfrein C : D6 = 0.3,  
 D8~20 = 0.5

FX-MG-REE



P. 128



EDP	D	L	l	d	€
8539560	6	80	13	6	
8539580	8	85	19	8	
8539600	10	100	22	10	
8539620	12	110	26	12	
8539640	14	110	26	12	
8539650	15	120	26	16	
8539660	16	125	32	16	
8539680	18	125	32	16	
8539700	20	140	38	20	

FX



HYP

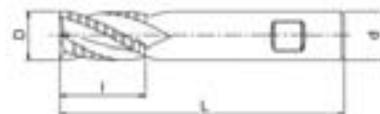
\* **HYP**  
 \* micro grain carbide

\* **HYP**  
 \* Hartmetall, Feinstkom

\* **HYP**  
 \* carburo micrograna

\* **HYP**  
 \* carbure micrograin

HYP-HP-RESF



EDP	D	L	l	d	n <sub>Δ</sub>	€
48624060	6	64	19	6	4	
48624080	8	64	21	8	4	
48624100	10	70	22	10	4	
48624120	12	76	25	12	4	
48624160	16	89	32	16	5	
48624200	20	102	38	20	6	
48624250	25	102	38	25	6	

	Applications		Anwendungen			Applicazioni			Applications				
FX-MG-REE	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
	⊙	⊙				○	⊙	○			○	○	
HYP-HP-RESF	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
	⊙	⊙				○	○						

Ball nose end mills - Kopierfräser - Frese sferiche - Fraises hémisphériques

\* HIGH PERFORMANCE \* HIGH PERFORMANCE \* ALTA PERFORMANCE \* HAUTE PERFORMANCE  
**FX-MG-EBD-3**



P. 129

EDP	R	D	L	l	d	€
8523504	0.2	0.4	40	0.8	3	
8523505	0.25	0.5	40	1.1	3	
8523506	0.3	0.6	40	1.1	3	
8523507	0.35	0.7	40	1.5	3	
8523508	0.4	0.8	40	2	3	
8523509	0.45	0.9	40	2.2	3	
8523510	0.5	1	40	2.5	3	
8523511	0.55	1.1	40	3	3	
8523512	0.6	1.2	40	3	3	
8523513	0.65	1.3	40	3.5	3	
8523514	0.7	1.4	40	3.5	3	
8523515	0.75	1.5	40	4	3	
8523516	0.8	1.6	40	4	3	
8523517	0.85	1.7	40	4.5	3	

EDP	R	D	L	l	d	€
8523518	0.9	1.8	40	4.5	3	
8523519	0.95	1.9	40	5	3	
8523520	1	2	40	5	3	
8523521	1.05	2.1	40	6	3	
8523522	1.1	2.2	40	6	3	
8523523	1.15	2.3	40	6	3	
8523524	1.2	2.4	40	6	3	
8523525	1.25	2.5	40	6	3	
8523526	1.3	2.6	40	8	3	
8523527	1.35	2.7	40	8	3	
8523528	1.4	2.8	40	8	3	
8523529	1.45	2.9	40	8	3	
8523530	1.5	3	40	8	3	

\* HIGH PERFORMANCE \* HIGH PERFORMANCE \* ALTA PERFORMANCE \* HAUTE PERFORMANCE  
 \* Double cut depth \* "S" Schliff, ermöglicht doppelte Schnitttiefe \* Elevata profondità di taglio \* Double profondeur de coupe  
 \* Incredible cutpower \* Kurze Schneidenlänge für hohe Stabilität \* Potenza elevata di taglio \* Puissance de coupe incroyable

**FX-HS-EBDS**



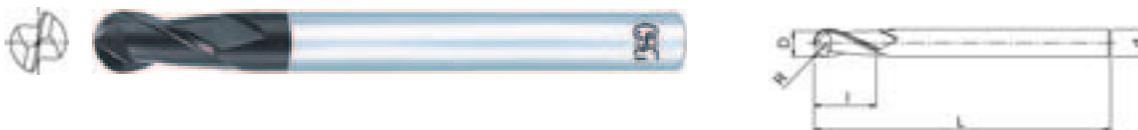
R ≤ 1 1.5 ≤ R P. 130

EDP	R	D	L	l1	l	d1	d	€
8521403	1.5	3	50	7.5	3	2.85	6	
8521404	2	4	50	10	4	3.85	6	
8521405	2.5	5	50	12.5	5	4.8	6	
8521406	3	6	50	15	6	5.7	6	
8521408	4	8	60	20	8	7.6	8	
8521410	5	10	70	25	10	9.5	10	
8521412	6	12	80	30	12	11.4	12	

		Applications		Anwendungen		Applicazioni		Applications						
		~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
FX-MG-EBD-3		⊙	⊙	⊙	○		⊙	⊙	○	○		○	○	
FX-HS-EBDS		⊙	⊙	⊙	⊙	○	⊙	⊙	○	○		○	○	

Ball nose end mills - Kopierfräser - Frese sferiche - Fraises hémisphériques

\* HIGH PERFORMANCE \* HIGH PERFORMANCE \* ALTA PERFORMANCE \* HAUTE PERFORMANCE  
**FX-MG-EBD**



P. 110-111



EDP	R	D	L	I	d	€
8521010	0.5	1	50	2.5	4	
8521012	0.6	1.2	50	3	4	
8521014	0.7	1.4	50	3.5	4	
8521015	0.75	1.5	50	4	4	
8521016	0.8	1.6	50	4	4	
8521018	0.9	1.8	50	4.5	4	
8521020	1	2	50	5	6	
8521025	1.25	2.5	60	6	6	
8521030	1.5	3	60	8	6	
8521035	1.75	3.5	70	8	6	
8521040	2	4	70	8	6	
8521041	2	4-4	60	8	4	
8521045	2.25	4.5	80	10	6	
8521050	2.5	5	80	10	6	
8521055	2.75	5.5	90	12	6	
8521060	3	6	90	12	6	
8521065	3.25	6.5	90	14	6	

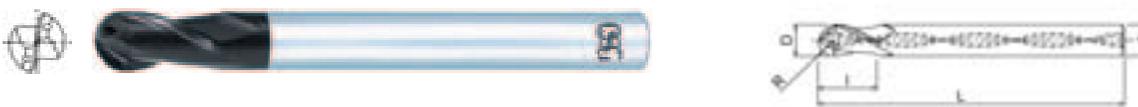
EDP	R	D	L	I	d	€
8521070	3.5	7	90	14	6	
8521075	3.75	7.5	90	14	6	
8521080	4	8	100	14	8	
8521085	4.25	8.5	100	18	8	
8521090	4.5	9	100	18	8	
8521095	4.75	9.5	100	18	8	
8521100	5	10	100	18	10	
8521110	5.5	11	100	22	10	
8521120	6	12	110	22	12	
8521130	6.5	13	110	26	12	
8521140	7	14	110	26	12	
8521150	7.5	15	110	30	12	
8521160	8	16	140	30	16	
8521180	9	18	140	34	16	
8521200	10	20	160	38	20	
8521250	12.5	25	180	50	25	
8521300	15	30	180	55	25	

FX



\* HIGH PERFORMANCE \* HIGH PERFORMANCE \* ALTA PERFORMANCE \* HAUTE PERFORMANCE  
 \* Better chip ejection with oil feed \* Optimale Spanabfuhr durch innere Kühlmittelzufuhr \* Per una migliore evacuazione del truciolo, con fori di lubrificazione \* Pour un meilleur dégageement du copeau

**FX-HO-MG-EBD**



P. 129



EDP	R	D	L	I	d	€
8521560	3	6	90	12	6	
8521580	4	8	100	14	8	
8521600	5	10	100	18	10	

EDP	R	D	L	I	d	€
8521620	6	12	110	22	12	
8521660	8	16	140	30	16	
8521700	10	20	160	38	20	

OSG Europe : www.osgeurope.com

	Applications		Anwendungen			Applicazioni		Applications					
FX-MG-EBD	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
	⊙	⊙	⊙	○		⊙	⊙	○	○		○	○	
FX-HO-MG-EBD	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
	⊙	⊙	⊙	○		⊙	⊙	○	○		○	○	

Ball nose end mills - Kopierfräser - Frese sferiche - Fraises hémisphériques

\* HIGH PERFORMANCE \* HIGH PERFORMANCE \* ALTA PERFORMANCE \* HAUTE PERFORMANCE  
**FX-LS-MG-EBD**



P. 110

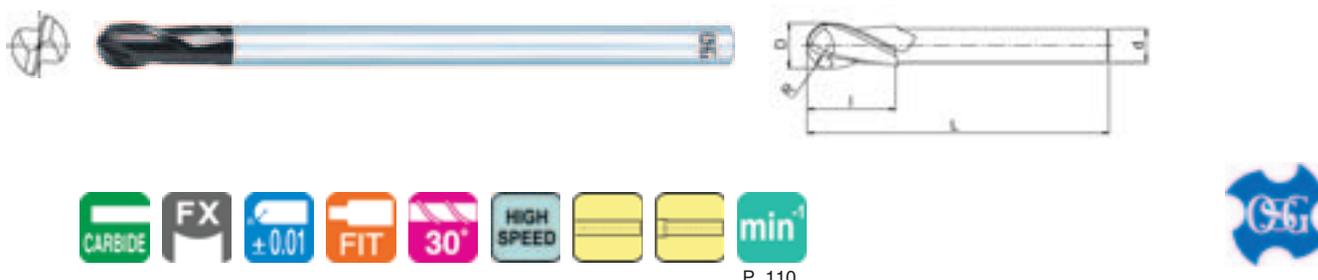
EDP	R	D	L	l	d	€
8541010	0.5	1	70	2.5	3	
8541020	1	2	70	5	3	
8541030	1.5	3	80	8	3	
8541040	2	4	100	8	4	
8541050	2.5	5	100	10	4	
8541060	3	6	140	12	6	
8541070	3.5	7	140	14	6	
8541080	4	8	160	14	8	
8541100	5	10	180	18	10	
8541110	5.5	11	180	22	10	
8541120	6	12	200	22	12	
8541140	7	14	200	26	12	
8541160	8	16	220	30	16	
8541180	9	18	220	34	16	
8541200	10	20	250	38	20	
8541250	12.5	25	280	50	25	
8541300	15	30	280	55	25	



FX



\* HIGH PERFORMANCE \* HIGH PERFORMANCE \* ALTA PERFORMANCE \* HAUTE PERFORMANCE  
**FX-SS-EBD**



P. 110

EDP	R	D	L	l	d	€
8408556	3	6	120	12	5	
8408558	4	8	130	14	7	
8408560	5	10	150	18	9	
8408562	6	12	160	22	11	

OSG Europe : www.osgeurope.com

	Applications		Anwendungen		Applicazioni		Applications						
	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
<b>FX-LS-MG-EBD</b>	☉	☉	☉	○		☉	☉	○	○		○	○	
<b>FX-SS-EBD</b>	☉	☉	☉	○		☉	☉	○	○		○	○	

## Ball nose end mills - Kopierfräser - Frese sferiche - Fraises hémisphériques

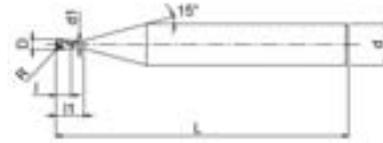
\* HIGH PERFORMANCE

\* HIGH PERFORMANCE

\* ALTA PERFORMANCE

\* HAUTE PERFORMANCE

FX-EBD-6



P. 132



EDP	R	l1	L	l	d1	d	€
8544402	0.1	-	50	0.2	-	6	
8544403	0.15	-	50	0.3	-	6	
8544404	0.2	-	50	0.4	-	6	
8544405	0.25	1.5	50	0.5	0.45	6	
8544806	0.3	1.1	50	0.6	0.55	6	
8544406	0.3	1.8	50	0.6	0.55	6	
8544808	0.4	1.5	50	0.8	0.75	6	
8544408	0.4	2.4	50	0.8	0.75	6	
8544810	0.5	1.8	50	1	0.95	6	
8544410	0.5	2.5	50	1	0.95	6	
8544812	0.6	2.2	50	1.2	1.15	6	
8544412	0.6	3	50	1.2	1.15	6	
8544414	0.7	3.5	50	1.4	1.35	6	
8544815	0.75	2.7	50	1.5	1.45	6	
8544415	0.75	3.8	50	1.5	1.45	6	
8544416	0.8	4	50	1.6	1.55	6	
8544418	0.9	4.5	50	1.8	1.75	6	
8544820	1	3.6	50	2	1.95	6	
8544420	1	5	50	2	1.95	6	
8544425	1.25	5	50	2.5	2.4	6	
8544430	1.5	6	50	3	2.85	6	
8544435	1.75	6	50	3.5	3.35	6	
8544440	2	6	50	4	3.85	6	
8544450	2.5	7.5	50	5	4.85	6	
8544460	3	9	50	6	5.85	6	

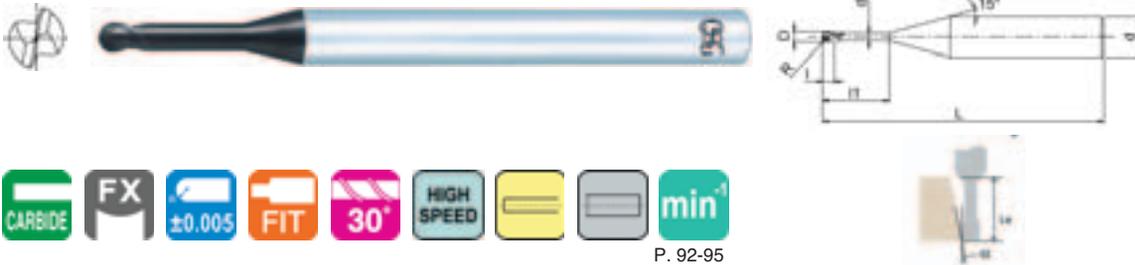
FX



FX-EBD-6	Applications - Anwendungen - Applicazioni - Applications												
	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
	⊙	⊙	⊙	○		⊙	⊙	○	○		○	○	

Ball nose end mills - Miniatur-Kopierfräser - Microfresa sferiche per nervature - Microfraises hémisphériques

\* HIGH PERFORMANCE \* HIGH PERFORMANCE \* ALTA PERFORMANCE \* HAUTE PERFORMANCE  
**FX-LN-EBD-6**



P. 92-95

EDP	R	l1	L	l	d1	d	€
8544505	0.25	2.5	60	0.5	0.45	6	
8544506	0.3	3	60	0.6	0.55	6	
8544508	0.4	4	60	0.8	0.75	6	
8544510	0.5	5	60	1	0.95	6	
8544512	0.6	6	60	1.2	1.15	6	
8544514	0.7	7	60	1.4	1.35	6	
8544515	0.75	7.5	60	1.5	1.45	6	
8544516	0.8	8	60	1.6	1.55	6	

EDP	R	l1	L	l	d1	d	€
8544518	0.9	9	60	1.8	1.75	6	
8544520	1	10	60	2	1.95	6	
8544525	1.25	12.5	60	2.5	2.4	6	
8544530	1.5	15	70	3	2.85	6	
8544535	1.75	17.5	70	3.5	3.35	6	
8544540	2	20	70	4	3.85	6	
8544550	2.5	25	80	5	4.85	6	
8544560	3	30	90	6	5.85	6	

\* HIGH PERFORMANCE \* HIGH PERFORMANCE \* ALTA PERFORMANCE \* HAUTE PERFORMANCE  
**FX-RB-EBD**



P. 131

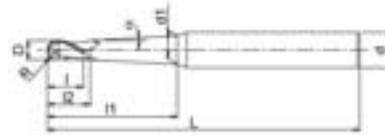
EDP	R	l1	L	l	d1	d	€
8540053	0.3	6	35	0.9	0.55	3	
8540093	0.4	6	45	1.2	0.75	4	
8540094	0.4	8	45	1.2	0.75	4	
8540133	0.5	6	45	1.5	0.97	4	
8540134	0.5	8	45	1.5	0.95	4	
8540135	0.5	10	45	1.5	0.95	4	
8540136	0.5	12	45	1.5	0.93	4	
8540174	0.6	8	45	1.8	1.15	4	
8540176	0.6	12	45	1.8	1.13	4	
8540216	0.7	12	45	2.1	1.33	4	
8540234	0.75	8	45	2.3	1.45	4	
8540236	0.75	12	45	2.3	1.43	4	

EDP	R	l1	L	l	d1	d	€
8540238	0.75	16	50	2.3	1.41	4	
8540258	0.8	16	50	2.4	1.51	4	
8540298	0.9	16	50	2.7	1.71	4	
8540334	1	8	45	3	1.95	4	
8540336	1	12	45	3	1.93	4	
8540338	1	16	50	3	1.91	4	
8540340	1	20	55	3	1.89	4	
8540538	1.5	16	55	4.5	2.85	6	
8540540	1.5	20	60	4.5	2.85	6	
8540558	2	16	60	6	3.85	6	
8540560	2	20	65	6	3.85	6	
8540561	2	25	70	6	3.85	6	

	Applications		Anwendungen		Applicazioni		Applications						
FX-RB-EBD	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
	⊙	⊙	⊙	○		⊙	⊙	○	○		○		
FX-LN-EBD-6	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
	⊙	⊙	⊙	○		⊙	⊙	○	○		○	○	

Ball nose end mills - Kopierfräser - Frese sferiche - Fraises hémisphériques

FX-PC-MG-EBD



P. 133

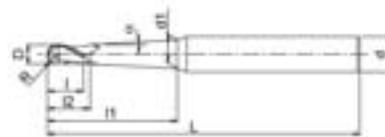


EDP	R	D	L	I	I1	I2	α	d1	d	€
8541410	0.5	1	60	2.5	20	4	5°	3.8	6	
8541414	0.5	1	70	2.5	20	4	1°30'	1.8	6	
8541412	0.5	1	80	2.5	40	4	3°	4.8	6	
8541530	1	2	60	5	20	7	5°	4.3	6	
8541534	1	2	70	5	20	7	1°30'	2.7	6	
8541532	1	2	80	5	40	7	3°	5.5	6	
8541571	1.5	3	70	8	30	10.5	3°	5	6	
8541573	1.5	3	90	8	50	10.5	1°30'	5.1	6	
8541611	2	4	70	8	28	10.5	3°	6	6	
8541613	2	4	90	8	48	10.5	1°30'	6	6	
8541653	2.5	5	90	10	40	12.5	3°	8	8	
8541655	2.5	5	110	10	60	12.5	1°30'	7.5	8	
8541693	3	6	90	12	33.5	14.5	3°	8	8	
8541695	3	6	110	12	52	14.5	1°30'	8	8	
8541774	4	8	100	14	35.5	16.5	3°	10	10	
8541776	4	8	120	14	54.5	16.5	1°30'	10	10	
8541855	5	10	110	18	39.5	20.5	3°	12	12	
8541857	5	10	130	18	58.5	20.5	1°30'	12	12	
8541898	6	12	140	22	60	25	3°	16	16	
8541899	6	12	160	22	80	25	1°30'	14.9	16	

FX



\* HIGH PERFORMANCE \* HIGH PERFORMANCE \* ALTA PERFORMANCE \* HAUTE PERFORMANCE  
FX-PCL-EBD



P. 134



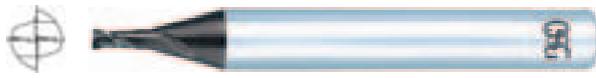
EDP	R	D	L	I	I1	I2	α	d1	d	€
8545604	2	4	200	8	100	12	1°30'	8.6	10	
8545606	3	6	200	12	120	18	1°30'	11.3	12	
8545608	4	8	200	14	100	24	1°30'	12	12	
8545610	5	10	250	18	140	30	1°30'	16	16	
8545612	6	12	250	22	110	36	1°30'	16	16	

OSG Europe : www.osgeurope.com

	Applications		Anwendungen		Applicazioni		Applications						
FX-PC-MG-EBD	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
	⊙	⊙	⊙	○		⊙	⊙	○	○		○	○	
FX-PCL-EBD	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
	⊙	⊙	⊙	○		⊙	⊙	○	○		○	○	

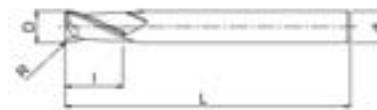
Radius end mills - Mehrschneider mit Eckenradius - Frese toriche - Fraises à rayons

\* HIGH PERFORMANCE \* HIGH PERFORMANCE \* ALTA PERFORMANCE \* HAUTE PERFORMANCE  
**FX-CR-EDS-6**



EDP	D	l1	R	L	l	d1	d	α (Le)						€
								0.5°	1°	1.5°	2°	2.5°	3°	
8545706	0.6	1.8	0.1	50	0.9	0.55	6	1.86	1.92	1.99	2.07	2.15	2.23	
8545708	0.8	2.4	0.1	50	1.2	0.75	6	2.48	2.56	2.66	2.76	2.86	2.98	
8545710	1	2.5	0.1	50	1.5	0.95	6	2.58	2.67	2.77	2.85	2.98	3.1	
8545712	1.2	3	0.1	50	1.8	1.15	6	3.1	3.2	3.32	3.45	3.58	3.72	
8545714	1.4	3.5	0.1	50	2.1	1.35	6	3.61	3.74	3.87	4.02	4.18	4.35	
8545715	1.5	3.8	0.1	50	2.3	1.45	6	3.92	4.06	4.21	4.36	4.54	4.72	
8545716	1.6	4	0.1	50	2.4	1.55	6	4.13	4.27	4.43	4.59	4.77	4.97	
8545718	1.8	4.5	0.1	50	2.7	1.75	6	4.62	4.81	4.98	5.17	5.37	5.59	
8545720	2	5	0.1	50	3	1.95	6	5.16	5.34	5.54	5.74	5.97	6.21	
8545725	2.5	5	0.1	50	3.7	2.4	6	5.16	5.34	5.54	5.74	5.97	6.21	

\* HIGH PERFORMANCE \* HIGH PERFORMANCE \* ALTA PERFORMANCE \* HAUTE PERFORMANCE  
**FX-CR-MG-EDS**



EDP	D	R	L	l	d	€
8543831	3	0.2	60	8	6	
8543833	3	0.5	60	8	6	
8543841	4	0.2	70	11	6	
8543843	4	0.5	70	11	6	
8543845	4	1	70	11	6	
8543851	5	0.2	80	13	6	
8543853	5	0.5	80	13	6	
8543855	5	1	80	13	6	
8543861	6	0.2	90	13	6	
8543863	6	0.5	90	13	6	
8543865	6	1	90	13	6	
8543867	6	1.5	90	13	6	
8543869	6	2	90	13	6	
8543883	8	0.5	100	19	8	

EDP	D	R	L	l	d	€
8543885	8	1	100	19	8	
8543887	8	1.5	100	19	8	
8543889	8	2	100	19	8	
8543903	10	0.5	100	22	10	
8543905	10	1	100	22	10	
8543907	10	1.5	100	22	10	
8543909	10	2	100	22	10	
8543913	10	3	100	22	10	
8543933	12	0.5	110	26	12	
8543935	12	1	110	26	12	
8543937	12	1.5	110	26	12	
8543939	12	2	110	26	12	
8543943	12	3	110	26	12	

FX

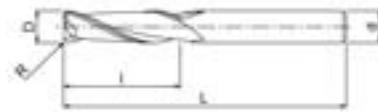


OSG Europe : www.osgeurope.com

		Applications		Anwendungen		Applicazioni		Applications						
FX-CR-EDS-6		~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
	⊙	⊙	⊙	○			○	⊙	○	○		○	○	
FX-CR-MG-EDS		~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
	⊙	⊙	○	○			○	⊙	○	○		○	○	

Radius end mills - Mehrschneider mit Eckenradius - Frese toriche - Fraises à rayons

\* HIGH PERFORMANCE \* HIGH PERFORMANCE \* ALTA PERFORMANCE \* HAUTE PERFORMANCE  
**FX-CR-MG-EDL**



EDP	D	R	L	I	d	€
8523643	6	0.5	90	20	6	
8523645	6	1	90	20	6	
8523663	8	0.5	100	28	8	
8523665	8	1	100	28	8	
8523667	8	1.5	100	28	8	
8523669	8	2	100	28	8	
8523683	10	0.5	100	34	10	
8523685	10	1	100	34	10	

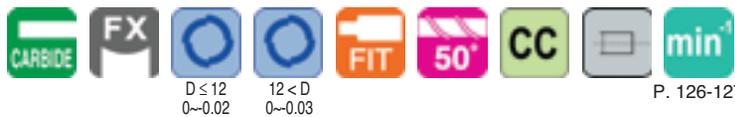
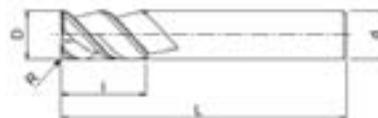
EDP	D	R	L	I	d	€
8523687	10	1.5	100	34	10	
8523689	10	2	100	34	10	
8523703	12	0.5	110	40	12	
8523705	12	1	110	40	12	
8523707	12	1.5	110	40	12	
8523709	12	2	110	40	12	
8523713	12	3	110	40	12	

FX



★ HIGH PERFORMANCE \* Positive and sharp cutting edge \* For difficult milling materials  
 ★ HIGH PERFORMANCE \* Pos. scharfe Schneidkante für reduzierte Schnittkräfte \* Für schwer zerspanbare Werkstoffe  
 ★ ALTA PERFORMANCE \* Taglio positivo e tranciante \* Per materiali difficili da lavorare  
 ★ HAUTE PERFORMANCE \* Coupe positive et tranchante \* Pour matière difficile à usiner

**FX-CR-MG-EHS**



EDP	D	R	L	I	d	€
8524261	6	0.2	90	13	6	
8524263	6	0.5	90	13	6	
8524265	6	1	90	13	6	
8524281	8	0.2	100	19	8	
8524283	8	0.5	100	19	8	
8524285	8	1	100	19	8	
8524289	8	2	100	19	8	
8524301	10	0.2	100	22	10	
8524303	10	0.5	100	22	10	
8524305	10	1	100	22	10	
8524309	10	2	100	22	10	
8524331	12	0.2	110	26	12	
8524333	12	0.5	110	26	12	
8524335	12	1	110	26	12	

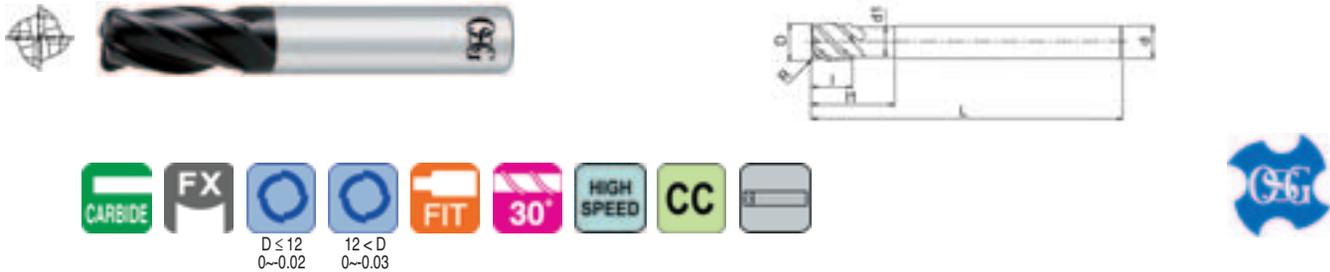
EDP	D	R	L	I	d	€
8524339	12	2	110	26	12	
8524343	12	3	110	26	12	
8524361	16	0.5	140	32	16	
8524362	16	1	140	32	16	
8524364	16	2	140	32	16	
8524365	16	3	140	32	16	
8524381	20	0.5	160	38	20	
8524382	20	1	160	38	20	
8524384	20	2	160	38	20	
8524385	20	3	160	38	20	
8524401	25	0.5	180	45	25	
8524402	25	1	180	45	25	
8524404	25	2	180	45	25	
8524405	25	3	180	45	25	

OSG Europe : www.osgeurope.com

		Applications - Anwendungen - Applicazioni - Applications											
FX-CR-MG-EDL	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
		⊙	⊙	○			○	⊙	○	○		○	○
FX-CR-MG-EHS	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
		⊙	⊙	○	○		⊙	⊙	○	○		⊙	⊙

Radius end mills - Mehrschneider mit Eckenradius - Frese toriche - Fraises à rayons

\* HIGH PERFORMANCE \* HIGH PERFORMANCE \* ALTA PERFORMANCE \* HAUTE PERFORMANCE  
**FX-CR-MG-EMS**



EDP	D	R	L	l	l1	d	d1	€
W0280011A	4	0.5	45	4	12	6	3.8	
W0280012A	6	0.5	50	6	18	6	5.8	
W0280013A	6	1	50	6	18	6	5.8	
W0280014A	8	0.5	60	8	24	8	7.8	
W0280015A	8	1	60	8	24	8	7.8	
W0280016A	10	0.5	70	10	30	10	9.7	
W0280017A	10	1	70	10	30	10	9.7	
W0280018A	12	1	75	12	36	12	11.7	

\* HIGH PERFORMANCE \* HIGH PERFORMANCE \* ALTA PERFORMANCE \* HAUTE PERFORMANCE  
**FX-CR-MG-EML**



EDP	D	R	L	l	d	€
8523843	6	0.5	90	20	6	
8523845	6	1	90	20	6	
8523863	8	0.5	100	28	8	
8523865	8	1	100	28	8	
8523867	8	1.5	100	28	8	
8523869	8	2	100	28	8	
8523883	10	0.5	100	34	10	
8523885	10	1	100	34	10	
8523887	10	1.5	100	34	10	
8523889	10	2	100	34	10	
8523903	12	0.5	110	40	12	
8523905	12	1	110	40	12	
8523907	12	1.5	110	40	12	

EDP	D	R	L	l	d	€
8523909	12	2	110	40	12	
8523913	12	3	110	40	12	
8523918	16	0.5	140	48	16	
8523920	16	1	140	48	16	
8523922	16	1.5	140	48	16	
8523924	16	2	140	48	16	
8523926	16	3	140	48	16	
8523933	20	0.5	160	56	20	
8523935	20	1	160	56	20	
8523937	20	1.5	160	56	20	
8523939	20	2	160	56	20	
8523941	20	3	160	56	20	

	Applications		Anwendungen		Applicazioni		Applications						
<b>FX-CR-MG-EMS</b>	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
	⊙	⊙	⊙	⊙	○	○	⊙				○	○	
<b>FX-CR-MG-EML</b>	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
	⊙	⊙	○			○	⊙	○	○		○	○	

OSG Europe : www.osgeurope.com

## Taper end mills - Konusfräser - Frese coniche - Fraises coniques

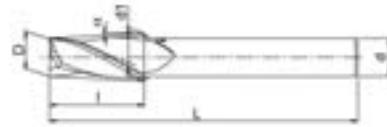
\* HIGH PERFORMANCE

\* HIGH PERFORMANCE

\* ALTA PERFORMANCE

\* HAUTE PERFORMANCE

FX-MG-TPDS



±5°

P. 135



EDP	D	$\alpha_{\Delta}$	L	l	d	d1	€
8537202	1	0.5°	50	4	4	1.07	
8537252	1	1°	50	4	4	1.14	
8537302	1	1.5°	50	4	4	1.21	
8537352	1	2°	50	4	4	1.28	
8537452	1	3°	50	4	4	1.42	
8537482	1	5°	50	4	4	1.7	
8537203	1.5	0.5°	50	5	4	1.59	
8537253	1.5	1°	50	5	4	1.68	
8537303	1.5	1.5°	50	5	4	1.76	
8537353	1.5	2°	50	5	4	1.85	
8537453	1.5	3°	50	5	4	2.02	
8537483	1.5	5°	50	5	4	2.38	
8537204	2	0.5°	50	6	4	2.11	
8537254	2	1°	50	6	4	2.21	
8537304	2	1.5°	50	6	4	2.31	
8537354	2	2°	50	6	4	2.42	
8537454	2	3°	50	6	4	2.63	
8537484	2	5°	50	6	4	3.05	
8537205	2.5	0.5°	50	8	4	2.64	
8537255	2.5	1°	50	8	4	2.78	
8537305	2.5	1.5°	50	8	4	2.92	
8537355	2.5	2°	50	8	4	3.06	
8537455	2.5	3°	50	8	4	3.34	
8537485	2.5	5°	50	8	4	3.9	
8537206	3	0.5°	60	10	6	3.18	
8537256	3	1°	60	10	6	3.35	
8537306	3	1.5°	60	10	6	3.52	
8537356	3	2°	60	10	6	3.7	
8537456	3	3°	60	10	6	4.05	
8537486	3	5°	60	10	6	4.75	
8537208	4	0.5°	60	15	6	4.26	

EDP	D	$\alpha_{\Delta}$	L	l	d	d1	€
8537258	4	1°	60	15	6	4.52	
8537308	4	1.5°	60	15	6	4.79	
8537358	4	2°	60	15	6	5.05	
8537458	4	3°	60	15	6	5.57	
8537488	4	5°	60	15	6	6.63	
8537210	5	0.5°	60	20	6	5.35	
8537260	5	1°	60	20	6	5.7	
8537310	5	1.5°	60	20	6	6.05	
8537360	5	2°	60	20	6	6.4	
8537460	5	3°	60	20	6	7.1	
8537490	5	5°	70	20	8	8.5	
8537212	6	0.5°	60	20	6	6.35	
8537262	6	1°	60	20	6	6.7	
8537312	6	1.5°	60	20	6	7.05	
8537362	6	2°	60	20	6	7.4	
8537462	6	3°	70	20	8	8.1	
8537492	6	5°	70	20	8	9.5	
8537216	8	0.5°	70	25	8	8.44	
8537266	8	1°	70	25	8	8.87	
8537316	8	1.5°	70	25	8	9.31	
8537366	8	2°	70	25	8	9.75	
8537466	8	3°	90	25	10	10.62	
8537496	8	5°	90	25	12	12.37	
8537220	10	0.5°	90	35	10	10.61	
8537270	10	1°	90	35	10	11.22	
8537320	10	1.5°	90	35	10	11.83	
8537370	10	2°	90	35	12	12.44	
8537470	10	3°	90	35	12	13.67	
8537500	10	5°	100	35	16	16.12	

Δ taper angle - Grad - angolo di conicità - angle de conicité

FX



FX-MG-TPDS	Applications - Anwendungen - Applicazioni - Applications													
	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.	
	⊙	⊙	⊙	○		○	⊙	○	○		○	○		

## Taper end mills - Konusfräser - Frese coniche - Fraises coniques

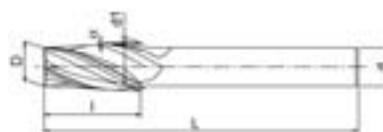
\* HIGH PERFORMANCE

\* HIGH PERFORMANCE

\* ALTA PERFORMANCE

\* HAUTE PERFORMANCE

FX-MG-TPMS



±5'

P. 135

EDP	D	$\alpha_{\Delta}$	L	l	d	d1	€
8537506	3	0.5°	60	10	6	3.18	
8537556	3	1°	60	10	6	3.35	
8537606	3	1.5°	60	10	6	3.52	
8537656	3	2°	60	10	6	3.7	
8537756	3	3°	60	10	6	4.05	
8537786	3	5°	60	10	6	4.75	
8537508	4	0.5°	60	15	6	4.26	
8537558	4	1°	60	15	6	4.52	
8537608	4	1.5°	60	15	6	4.79	
8537658	4	2°	60	15	6	5.05	
8537758	4	3°	60	15	6	5.57	
8537788	4	5°	60	15	6	6.63	
8537510	5	0.5°	60	20	6	5.35	
8537560	5	1°	60	20	6	5.7	
8537610	5	1.5°	60	20	6	6.05	
8537660	5	2°	60	20	6	6.4	
8537760	5	3°	60	20	6	7.1	
8537790	5	5°	70	20	8	8.5	
8537512	6	0.5°	60	20	6	6.35	
8537562	6	1°	60	20	6	6.7	
8537612	6	1.5°	60	20	6	7.05	
8537662	6	2°	60	20	6	7.4	
8537762	6	3°	70	20	8	8.1	
8537792	6	5°	70	20	8	9.5	
8537516	8	0.5°	70	25	8	8.44	
8537566	8	1°	70	25	8	8.87	
8537616	8	1.5°	70	25	8	9.31	
8537666	8	2°	70	25	8	9.75	
8537766	8	3°	90	25	10	10.62	
8537796	8	5°	90	25	12	12.37	
8537520	10	0.5°	90	35	10	10.61	
8537570	10	1°	90	35	10	11.22	
8537620	10	1.5°	90	35	10	11.83	
8537670	10	2°	90	35	12	12.44	
8537770	10	3°	90	35	12	13.67	
8537800	10	5°	100	35	16	16.12	

Δ taper angle - Grad - angolo di conicità - angle de conicité



FX



FX-MG-TPMS	Applications - Anwendungen - Applicazioni - Applications													
	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.	
	⊙	⊙	⊙	○		○	⊙	○	○		○	○		

Multiflute end mills - Mehrschneider - Fresa multidenti - Fraises multilèvres



\* ULTRA HIGH PERFORMANCE

\* ULTRA HIGH PERFORMANCE

\* ULTRA ALTA PERFORMANCE

\* ULTRA HAUTE PERFORMANCE

FXS-EMSS



P. 115

EDP	D	L	l	d	n <sub>Δ</sub>	€
8544610	1	60	2	6	4	
8544615	1.5	60	3	6	4	
8544620	2	60	4	6	4	
8544625	2.5	60	5	6	4	
8544630	3	60	6	6	4	
8544635	3.5	60	7	6	4	
8544640	4	60	8	6	4	
8544645	4.5	60	9	6	4	

EDP	D	L	l	d	n <sub>Δ</sub>	€
8544650	5	60	10	6	4	
8544655	5.5	60	11	6	4	
8544660	6	60	12	6	6	
8544680	8	70	16	8	6	
8544700	10	80	20	10	6	
8544720	12	90	24	12	6	

Δ number of flutes - Anzahl Schneiden - numero di denti - nombre de lèvres

FXS



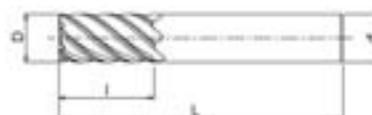
\* ULTRA HIGH PERFORMANCE

\* ULTRA HIGH PERFORMANCE

\* ULTRA ALTA PERFORMANCE

\* ULTRA HAUTE PERFORMANCE

FXS-EMS



P. 115

EDP	D	L	l	d	n <sub>Δ</sub>	€
8517510	1	60	3.5	6	4	
8517515	1.5	60	5	6	4	
8517520	2	60	7	6	4	
8517525	2.5	60	8	6	4	
8517530	3	60	10	6	4	
8517535	3.5	60	12	6	4	
8517540	4	60	12	6	4	
8517545	4.5	60	15	6	4	
8517550	5	60	15	6	4	
8517555	5.5	60	15	6	4	
8517560	6	60	15	6	6	

EDP	D	L	l	d	n <sub>Δ</sub>	€
8517580	8	70	20	8	6	
8517600	10	80	25	10	6	
8517620	12	90	30	12	6	
8517640	14	100	35	16	6	
8517650	15	105	40	16	6	
8517660	16	105	40	16	6	
8517680	18	110	40	20	6	
8517700	20	110	45	20	6	
8517750	25	125	50	25	8	
8517800	30	140	55	32	8	

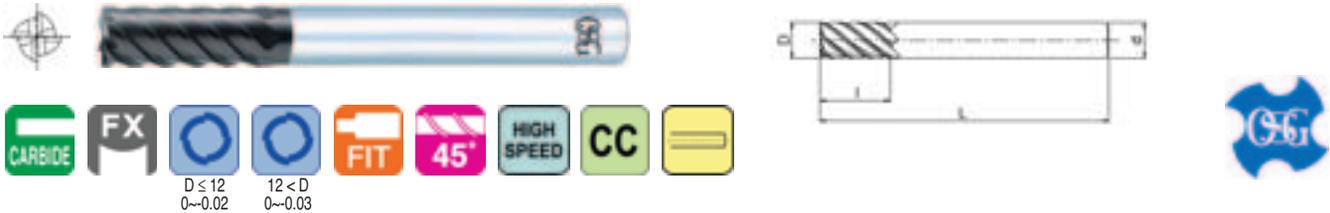
Δ number of flutes - Anzahl Schneiden - numero di denti - nombre de lèvres

OSG Europe : www.osgeurope.com

Applications - Anwendungen - Applicazioni - Applications														
FXS-EMSS	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.	
	⊙	⊙	⊙	⊙	○	○	⊙				○	○		
FXS-EMS	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.	
	⊙	⊙	⊙	⊙	○	○	⊙				○	○		

Multiflute end mills - Mehrschneider - Fresa multidenti - Fraises multilèvres

\* HIGH PERFORMANCE \* HIGH PERFORMANCE \* ALTA PERFORMANCE \* HAUTE PERFORMANCE  
**FXS-LS-EMS**



EDP	D	L	l	d	n <sub>Δ</sub>	€
8538530	3	80	10	6	4	
8538540	4	80	12	6	4	
8538550	5	80	15	6	4	
8538560	6	90	15	6	6	
8538580	8	100	20	8	6	
8538600	10	100	25	10	6	
8538620	12	110	30	12	6	
8538660	16	140	40	16	6	

EDP	D	L	l	d	n <sub>Δ</sub>	€
8538680	18	160	40	16	6	
8538700	20	160	45	20	6	
8538720	22	180	45	20	6	
8538750	25	180	50	25	8	
8538780	28	200	55	25	8	
8538800	30	200	55	32	8	
8538900	30	200	55	25	8	

Δ number of flutes - Anzahl Schneiden - numero di denti - nombre de lèvres

\* HIGH PERFORMANCE \* HIGH PERFORMANCE \* ALTA PERFORMANCE \* HAUTE PERFORMANCE  
**FXS-EML**



EDP	D	L	l	d	n <sub>Δ</sub>	€
8518560	6	70	25	6	6	
8518580	8	80	35	8	6	
8518600	10	100	45	10	6	
8518620	12	110	55	12	6	

EDP	D	L	l	d	n <sub>Δ</sub>	€
8518660	16	125	65	16	6	
8518700	20	140	75	20	6	
8518750	25	165	90	25	8	

Δ number of flutes - Anzahl Schneiden - numero di denti - nombre de lèvres

\* HIGH PERFORMANCE \* HIGH PERFORMANCE \* ALTA PERFORMANCE \* HAUTE PERFORMANCE  
**FXS-HPE**



EDP	D	L	l	d	€
8546600	10	130	15	8	
8546620	12	150	18	10	
8546640	14	160	21	12	

EDP	D	L	l	d	€
8546680	18	180	27	16	
8546720	22	200	33	20	

	Applications		Anwendungen		Applicazioni		Applications						
	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
FXS-LS-EMS	⊙	⊙	⊙	⊙	○	○	⊙				○	○	
FXS-EML	⊙	⊙	⊙	⊙		○	⊙				○	○	
FXS-HPE	⊙	⊙	⊙	⊙		○	⊙				○	○	



FXS



Ball nose end mills - Kopierfräser - Frese sferiche - Fraises hémisphériques



★ **HIGH PERFORMANCE**  
\* Rigid end mill for hardened steel

\* **HIGH PERFORMANCE**  
\* Stabile  
Schneidengeometrie für Kopierfräsen

\* **ALTA PERFORMANCE**  
\* Frese rigide per acciaio trattato

\* **HAUTE PERFORMANCE**  
\* Fraise rigide pour acier traité

**FXS-EBDS**



P. 117



EDP	R	D	l1	L	l	d1	d	€
8518001	0.5	1	2.2	50	1	0.95	4	
8518050	0.75	1.5	3	50	1.5	1.4	4	
8518002	1	2	4	50	2	1.9	6	
8518003	1.5	3	6	60	3	2.9	6	
8518004	2	4	8	60	4	3.9	6	
8518044	2	4-4	8	70	4	3.9	4	
8518005	2.5	5	10	80	5	4.9	6	
8518006	3	6	12	90	6	5.9	6	
8518008	4	8	16	100	8	7.9	8	
8518010	5	10	20	100	10	9.9	10	
8518012	6	12	24	110	12	11.9	12	
8518016	8	16	32	140	16	15.8	16	
8518020	10	20	40	160	20	19.8	20	
8518025	12.5	25	50	180	25	24.8	25	

**FXS**



\* **HIGH PERFORMANCE**  
\* Rigid end mill for hardened steel

\* **HIGH PERFORMANCE**  
\* Stabile  
Schneidengeometrie für Kopierfräsen

\* **ALTA PERFORMANCE**  
\* Frese rigide per acciaio trattato

\* **HAUTE PERFORMANCE**  
\* Fraise rigide pour acier traité

**FXS-HO-EBDS**



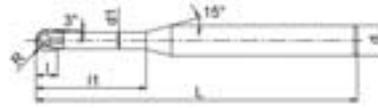
EDP	R	D	l1	L	l	d1	d	€
8518306	3	6	12	90	6	5.9	6	
8518308	4	8	16	100	8	7.9	8	
8518310	5	10	20	100	10	9.9	10	
8518312	6	12	24	110	12	11.9	12	
8518316	8	16	32	140	16	15.8	16	
8518320	10	20	40	160	20	19.8	20	

OSG Europe : www.osgeurope.com

	Applications		Anwendungen		Applicazioni		Applications						
<b>FXS-EBDS</b>	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
	⊙	⊙	⊙	⊙	○	⊙	⊙				○	○	
<b>FXS-HO-EBDS</b>	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
	⊙	⊙	⊙	⊙	○	⊙	⊙				○	○	

Ball nose end mills - Kopierfräser - Frese sferiche - Fraises hémisphériques

\* HIGH PERFORMANCE \* HIGH PERFORMANCE \* ALTA PERFORMANCE \* HAUTE PERFORMANCE **FXS-EQD**

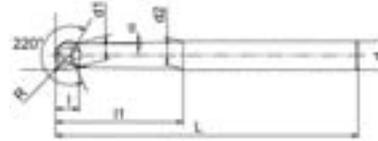
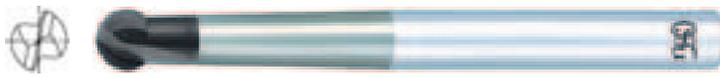


P. 117



EDP	R	L	l	d	l1	d1	d2	€
8544005	0.5	60	0.7	6	5	0.85	0.85	
8544010	1	60	1.5	6	10	1.7	1.7	
8544015	1.5	70	2.3	6	15	2.7	2.7	
8544020	2	70	3	6	20	3.7	3.7	

\* HIGH PERFORMANCE \* HIGH PERFORMANCE \* ALTA PERFORMANCE \* HAUTE PERFORMANCE **FXS-EQD**



P. 117



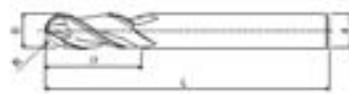
EDP	R	L	l	d	l1	d1	d2	α	€
8544030	3	90	4	6	30	4.6	5.9	1°30'	
8544040	4	100	5.4	8	40	6.2	7.9	1°30'	
8544050	5	110	6.7	10	50	7.7	9.9	1°30'	

FXS



- |                                                                                                                                                                 |                                                                                                                                                                            |                                                                                                                                                                              |                                                                                                                                                                          |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>* <b>HIGH PERFORMANCE</b></p> <ul style="list-style-type: none"> <li>* Rigid end mill for hardened steel</li> <li>* Feed may be increase with 50%</li> </ul> | <p>* <b>HIGH PERFORMANCE</b></p> <ul style="list-style-type: none"> <li>* Stabile Schneidengeometrie für Kopierfräsen</li> <li>* 50% Vorschubsteigerung möglich</li> </ul> | <p>* <b>ALTA PERFORMANCE</b></p> <ul style="list-style-type: none"> <li>* Frese rigide per acciaio trattato</li> <li>* L'avanzamento puo essere aumentato del 50%</li> </ul> | <p>* <b>HAUTE PERFORMANCE</b></p> <ul style="list-style-type: none"> <li>* Fraise rigide pour acier traité</li> <li>* Avances peuvent étres augmentées de 50%</li> </ul> |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**FXS-EBT**



P. 118



EDP	R	D	L	l1	d	€
8518106	3	6	90	12	6	
8518108	4	8	100	14	8	
8518110	5	10	100	18	10	

EDP	R	D	L	l1	d	€
8518112	6	12	110	22	12	
8518116	8	16	140	30	16	
8518120	10	20	160	38	20	

		Applications		Anwendungen		Applicazioni		Applications					
FXS-EQD	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
	⊙	⊙	⊙	○		⊙	⊙				○	○	
FXS-EBT	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
	⊙	⊙	⊙	⊙	○								

Ball nose end mills - Kopierfräser - Frese sferiche - Fraises hémisphériques



- |                                                                                                                                                                                                   |                                                                                                                                                                                                                 |                                                                                                                                                                                                                   |                                                                                                                                                                                                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>* <b>HIGH PERFORMANCE</b></li> <li>* Rigid end mill for hardened steel</li> <li>* High feed and speed</li> <li>* Exterior mold roughing milling</li> </ul> | <ul style="list-style-type: none"> <li>* <b>HIGH PERFORMANCE</b></li> <li>* Stabile Schneidengeometrie für Kopierfräsen</li> <li>* HSC, allgemeine Anwendung</li> <li>* Für Formen Aussenbearbeitung</li> </ul> | <ul style="list-style-type: none"> <li>* <b>ALTA PERFORMANCE</b></li> <li>* Frese rigide per acciaio trattato</li> <li>* Alti avanzamenti e velocità di taglio</li> <li>* Sgrossature, in contornatura</li> </ul> | <ul style="list-style-type: none"> <li>* <b>HAUTE PERFORMANCE</b></li> <li>* Fraise rigide pour acier traité</li> <li>* Hautes avances et vitesses de coupe</li> <li>* Ebauche, usinage de moule extérieur</li> </ul> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**FXS-HS-EBM**



P. 119

EDP	R	D	L	l	d	€
8521706	3	6	50	12	6	
8521708	4	8	50	14	8	
8521710	5	10	70	18	10	

EDP	R	D	L	l	d	€
8521712	6	12	80	22	12	
8521716	8	16	100	30	16	
8521720	10	20	110	38	20	

**FXS**



- |                                                                                                                                                                                                   |                                                                                                                                                                                                                 |                                                                                                                                                                                                                   |                                                                                                                                                                                                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>* <b>HIGH PERFORMANCE</b></li> <li>* Rigid end mill for hardened steel</li> <li>* High feed and speed</li> <li>* Exterior mold roughing milling</li> </ul> | <ul style="list-style-type: none"> <li>* <b>HIGH PERFORMANCE</b></li> <li>* Stabile Schneidengeometrie für Kopierfräsen</li> <li>* HSC, allgemeine Anwendung</li> <li>* Für Formen Aussenbearbeitung</li> </ul> | <ul style="list-style-type: none"> <li>* <b>ALTA PERFORMANCE</b></li> <li>* Frese rigide per acciaio trattato</li> <li>* Alti avanzamenti e velocità di taglio</li> <li>* Sgrossature, in contornatura</li> </ul> | <ul style="list-style-type: none"> <li>* <b>HAUTE PERFORMANCE</b></li> <li>* Fraise rigide pour acier traité</li> <li>* Hautes avances et vitesses de coupe</li> <li>* Ebauche, usinage de moule extérieur</li> </ul> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**FXS-EBM**



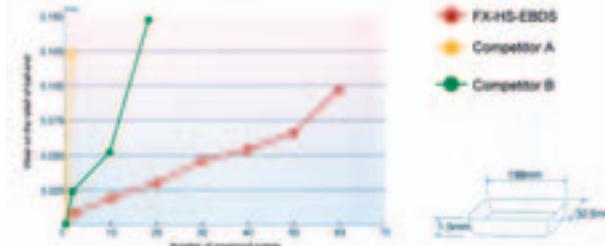
P. 119

EDP	R	D	L	l1	d	€
8518206	3	6	90	12	6	
8518208	4	8	100	14	8	
8518210	5	10	100	18	10	

EDP	R	D	L	l1	d	€
8518212	6	12	110	22	12	
8518216	8	16	140	30	16	
8518220	10	20	160	38	20	

**FX-HS-EBDS Performance Data**

Size	R3 x15	Milling Method	Pocket milling
Mat.	50 HRC	Depth of Cut	a <sub>a</sub> = 1.5 mm P <sub>f</sub> = 2.5 mm
Cutting Speed	282.6 m/min (15.000 min <sup>-1</sup> )	Coolant	Jet d'air Air Blow
Feed	4.500 mm/min (0.15 mm/t)	Machine	Hor. Machining Center (BT40)

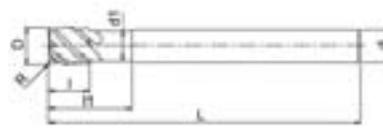


OSG Europe : www.osgeurope.com

	Applications		Anwendungen		Applicazioni		Applications						
<b>FXS-HS-EBM</b>	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
<b>FXS-EBM</b>	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.

Radius end mills - Mehrschneider mit Eckenradius - Frese toriche - Fraises à rayons

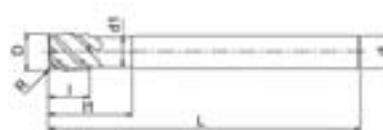
\* **NEW** \* **NEU** \* **NUOVO** \* **NOUVEAU**  
 \* HIGH PERFORMANCE \* HIGH PERFORMANCE \* ALTA PERFORMANCE \* HAUTE PERFORMANCE  
**FXS-HS-PKE**



EDP	D	R	L	I	I1	d1	d	€
8535016	6	0.5	50	9	15	5.7	6	
8535216	6	1	50	9	15	5.7	6	
8535018	8	0.5	60	12	20	7.6	8	
8535218	8	1	60	12	20	7.6	8	
8535020	10	0.5	70	15	25	9.5	10	
8535220	10	1	70	15	25	9.5	10	
8535022	12	0.5	80	18	30	11.4	12	

EDP	D	R	L	I	I1	d1	d	€
8535222	12	1	80	18	30	11.4	12	
8535226	16	1	100	24	40	15.2	16	
8535626	16	2	100	24	40	15.2	16	
8535826	16	3	100	24	40	15.2	16	
8535230	20	1	110	30	50	19	20	
8535630	20	2	110	30	50	19	20	
8535830	20	3	110	30	50	19	20	

\* **NEW** \* **NEU** \* **NUOVO** \* **NOUVEAU**  
 \* HIGH PERFORMANCE \* HIGH PERFORMANCE \* ALTA PERFORMANCE \* HAUTE PERFORMANCE  
**FXS-PKE**



EDP	D	R	L	I	I1	d1	d	€
8547803	3	0.2	60	5	9	2.85	6	
8547853	3	0.2	70	5	15	2.85	6	
8548003	3	0.5	60	5	9	2.85	6	
8548053	3	0.5	70	5	15	2.85	6	
8547804	4	0.2	70	6	12	3.8	6	
8547854	4	0.2	80	6	20	3.8	6	
8548004	4	0.5	70	6	12	3.8	6	
8548054	4	0.5	80	6	20	3.8	6	
8547805	5	0.2	80	8	15	4.8	6	
8547855	5	0.2	90	8	25	4.8	6	
8548005	5	0.5	80	8	15	4.8	6	
8548055	5	0.5	90	8	25	4.8	6	
8548006	6	0.5	90	9	18	5.8	6	
8548056	6	0.5	100	9	30	5.8	6	
8548206	6	1	90	9	18	5.8	6	
8548256	6	1	100	9	30	5.8	6	
8548008	8	0.5	100	12	24	7.7	8	
8548058	8	0.5	110	12	40	7.7	8	
8548208	8	1	100	12	24	7.7	8	

EDP	D	R	L	I	I1	d1	d	€
8548258	8	1	110	12	40	7.7	8	
8548010	10	0.5	100	15	30	9.7	10	
8548060	10	0.5	120	15	50	9.7	10	
8548210	10	1	100	15	30	9.7	10	
8548260	10	1	120	15	50	9.7	10	
8548610	10	2	100	15	30	9.7	10	
8548660	10	2	120	15	50	9.7	10	
8548012	12	0.5	110	18	36	11.7	12	
8548062	12	0.5	130	18	60	11.7	12	
8548212	12	1	110	18	36	11.7	12	
8548262	12	1	130	18	60	11.7	12	
8548612	12	2	110	18	36	11.7	12	
8548662	12	2	130	18	60	11.7	12	
8548216	16	1	140	24	48	15.5	16	
8548616	16	2	140	24	48	15.5	16	
8548816	16	3	140	24	48	15.5	16	
8548220	20	1	160	30	60	19.4	20	
8548620	20	2	160	30	60	19.4	20	
8548820	20	3	160	30	60	19.4	20	

Applications - Anwendungen - Applicazioni - Applications	
<b>FXS-HS-PKE</b>	~40 HRC ~45 HRC ~55 HRC ~60 HRC ~65 HRC SUS ~35 HRC GG-GGG ~350 HB Cu Al Graphite Ti HRS Plast.
<b>FXS-PKE</b>	~40 HRC ~45 HRC ~55 HRC ~60 HRC ~65 HRC SUS ~35 HRC GG-GGG ~350 HB Cu Al Graphite Ti HRS Plast.



FXS



Radius end mills - Mehrschneider mit Eckenradius - Frese toriche - Fraises à rayons



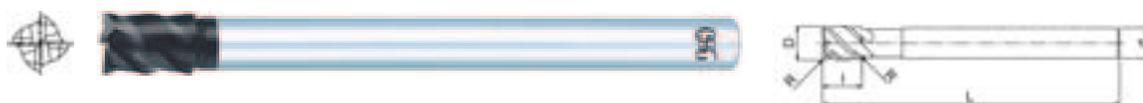
\* HIGH PERFORMANCE  
\* Radius at both ends of cutting part

\* HIGH PERFORMANCE  
\* Eckenradius vorne und hinten

\* ALTA PERFORMANCE  
\* Con raggio anteriore e posteriore

\* HAUTE PERFORMANCE  
\* A rayon avant et arrière

FXS-MFE



EDP	D	R	L	l	d	€
8546103	10	0.5	130	15	8	
8546105	10	1	130	15	8	
8546123	12	0.5	150	18	10	
8546125	12	1	150	18	10	
8546143	14	0.5	160	21	12	

EDP	D	R	L	l	d	€
8546145	14	1	160	21	12	
8546183	18	0.5	180	27	16	
8546185	18	1	180	27	16	
8546223	22	0.5	200	33	20	
8546225	22	1	200	33	20	

FXS



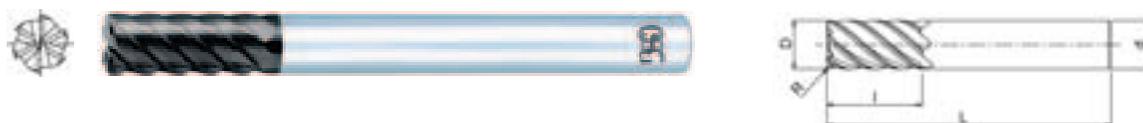
\* HIGH PERFORMANCE

\* HIGH PERFORMANCE

\* ALTA PERFORMANCE

\* HAUTE PERFORMANCE

FXS-CR-EMS



EDP	D	R	L	l	n <sub>Δ</sub>	d	€
8545511	6	0.5	90	15	6	6	
8545512	6	1	90	15	6	6	
8545516	8	0.5	100	20	6	8	
8545517	8	1	100	20	6	8	
8545518	8	2	100	20	6	8	
8545521	10	0.5	100	25	6	10	
8545522	10	1	100	25	6	10	
8545523	10	2	100	25	6	10	
8545526	12	0.5	110	30	6	12	
8545527	12	1	110	30	6	12	
8545528	12	2	110	30	6	12	
8545529	12	3	110	30	6	12	
8545531	16	0.5	140	40	6	16	

EDP	D	R	L	l	n <sub>Δ</sub>	d	€
8545532	16	1	140	40	6	16	
8545533	16	2	140	40	6	16	
8545534	16	3	140	40	6	16	
8545536	20	0.5	160	45	6	20	
8545537	20	1	160	45	6	20	
8545538	20	2	160	45	6	20	
8545539	20	3	160	45	6	20	
8545541	25	0.5	180	50	8	25	
8545542	25	1	180	50	8	25	
8545543	25	2	180	50	8	25	
8545544	25	3	180	50	8	25	

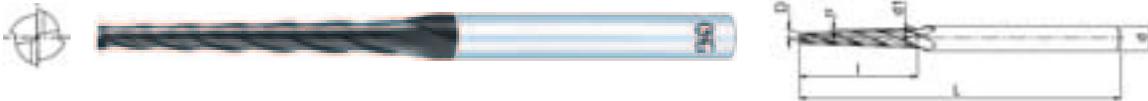
Δ number of flutes - Anzahl Schneiden - numero di denti - nombre de lèvres

OSG Europe : www.osgeurope.com

		Applications - Anwendungen - Applicazioni - Applications											
FXS-MFE	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
		⊙	⊙	⊙	○		○	⊙				○	○
FXS-CR-EMS	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
		⊙	⊙	⊙	⊙	○	○	⊙				○	○

Taper end mills - Miniatur-Konusfräser - Microfresa coniche per nervature - Microfraises coniques

\* HIGH PERFORMANCE    \* HIGH PERFORMANCE    \* ALTA PERFORMANCE    \* HAUTE PERFORMANCE  
**FXS-RB-TPE**



P. 123

EDP	D	$\alpha_{\Delta}$	l	L	d1	d	€
8507394	0.5	30'	2	35	0.54	3	
8507395	0.5	30'	4	35	0.57	3	
8507396	0.5	30'	6	35	0.60	3	
8505695	0.5	45'	4	35	0.61	3	
8505696	0.5	45'	6	35	0.66	3	
8507494	0.5	1°	2	35	0.57	3	
8507495	0.5	1°	4	35	0.64	3	
8507496	0.5	1°	6	35	0.71	3	
8507905	0.5	1°30'	4	35	0.71	3	
8507906	0.5	1°30'	6	35	0.81	3	
8507935	0.5	2°	4	35	0.78	3	
8507936	0.5	2°	6	35	0.92	3	
8507820	0.5	3°	4	35	0.92	3	
8507400	0.6	30'	4	35	0.67	3	
8507401	0.6	30'	6	35	0.71	3	
8505700	0.6	45'	4	35	0.71	3	
8505701	0.6	45'	6	35	0.76	3	
8507500	0.6	1°	4	35	0.74	3	
8507501	0.6	1°	6	35	0.81	3	
8507600	0.6	1°30'	4	35	0.81	3	
8507601	0.6	1°30'	6	35	0.91	3	
8507700	0.6	2°	4	35	0.88	3	
8507701	0.6	2°	6	35	1.02	3	
8507825	0.6	3°	4	35	1.02	3	
8507405	0.7	30'	6	35	0.80	3	
8507406	0.7	30'	8	45	0.84	4	
8505705	0.7	45'	6	35	0.86	3	
8505706	0.7	45'	8	45	0.91	4	
8507505	0.7	1°	6	35	0.91	3	
8507506	0.7	1°	8	45	0.98	4	
8507605	0.7	1°30'	6	35	1.01	3	
8507606	0.7	1°30'	8	45	1.12	4	
8507705	0.7	2°	6	35	1.12	3	
8507706	0.7	2°	8	45	1.26	4	
8507830	0.7	3°	6	35	1.33	3	
8507411	0.8	30'	6	35	0.91	3	
8507412	0.8	30'	8	45	0.94	4	
8507413	0.8	30'	10	45	0.98	4	
8505711	0.8	45'	6	35	0.96	3	
8505712	0.8	45'	8	45	1.01	4	
8505713	0.8	45'	10	45	1.06	4	
8507511	0.8	1°	6	35	1.01	3	
8507512	0.8	1°	8	45	1.08	4	
8507513	0.8	1°	10	45	1.15	4	
8507611	0.8	1°30'	6	35	1.11	3	
8507612	0.8	1°30'	8	45	1.22	4	
8507613	0.8	1°30'	10	45	1.32	4	
8507711	0.8	2°	6	35	1.22	3	
8507712	0.8	2°	8	45	1.34	4	
8507713	0.8	2°	10	45	1.50	4	
8507835	0.8	3°	6	35	1.43	3	
8507837	0.8	3°	10	45	1.85	4	
8507415	0.9	30'	6	35	1.00	3	
8507416	0.9	30'	8	45	1.04	4	
8507417	0.9	30'	10	45	1.07	4	
8505715	0.9	45'	6	35	1.06	3	
8505716	0.9	45'	8	45	1.11	4	
8505717	0.9	45'	10	45	1.16	4	
8507515	0.9	1°	6	35	1.11	3	
8507516	0.9	1°	8	45	1.18	4	

EDP	D	$\alpha_{\Delta}$	l	L	d1	d	€
8507517	0.9	1°	10	45	1.34	4	
8507615	0.9	1°30'	6	35	1.21	3	
8507616	0.9	1°30'	8	45	1.32	4	
8507617	0.9	1°30'	10	45	1.42	4	
8507715	0.9	2°	6	35	1.32	3	
8507716	0.9	2°	8	45	1.46	4	
8507717	0.9	2°	10	45	1.60	4	
8507840	0.9	3°	8	45	1.74	4	
8507422	1	30'	8	45	1.14	4	
8507423	1	30'	10	45	1.18	4	
8507424	1	30'	12	45	1.21	4	
8505722	1	45'	8	45	1.21	4	
8505723	1	45'	10	45	1.26	4	
8505724	1	45'	12	45	1.31	4	
8507522	1	1°	8	45	1.28	4	
8507523	1	1°	10	45	1.35	4	
8507524	1	1°	12	45	1.42	4	
8507622	1	1°30'	8	45	1.42	4	
8507623	1	1°30'	10	45	1.52	4	
8507624	1	1°30'	12	45	1.63	4	
8507722	1	2°	8	45	1.60	4	
8507723	1	2°	10	45	1.70	4	
8507724	1	2°	12	45	1.84	4	
8507845	1	3°	8	45	1.84	4	
8507847	1	3°	12	45	2.26	4	
8507432	1.2	30'	8	45	1.34	4	
8507433	1.2	30'	10	45	1.38	4	
8507434	1.2	30'	12	45	1.41	4	
8507435	1.2	30'	16	50	1.48	4	
8505732	1.2	45'	8	45	1.41	4	
8505733	1.2	45'	10	45	1.46	4	
8505734	1.2	45'	12	45	1.51	4	
8505735	1.2	45'	16	50	1.62	4	
8507532	1.2	1°	8	45	1.48	4	
8507533	1.2	1°	10	45	1.55	4	
8507534	1.2	1°	12	45	1.62	4	
8507535	1.2	1°	16	50	1.76	4	
8507632	1.2	1°30'	8	45	1.62	4	
8507633	1.2	1°30'	10	45	1.72	4	
8507634	1.2	1°30'	12	45	1.83	4	
8507635	1.2	1°30'	16	50	2.04	4	
8507732	1.2	2°	8	45	1.76	4	
8507733	1.2	2°	10	45	1.90	4	
8507734	1.2	2°	12	45	2.04	4	
8507735	1.2	2°	16	50	2.32	4	
8507850	1.2	3°	10	45	2.25	4	
8507852	1.2	3°	16	50	2.88	4	
8507442	1.5	30'	8	45	1.64	4	
8507443	1.5	30'	10	45	1.68	4	
8507444	1.5	30'	12	45	1.71	4	
8507445	1.5	30'	16	50	1.78	4	
8507446	1.5	30'	20	55	1.85	4	
8505742	1.5	45'	8	45	1.71	4	
8505743	1.5	45'	10	45	1.76	4	
8505744	1.5	45'	12	45	1.81	4	
8505745	1.5	45'	16	50	1.92	4	
8505746	1.5	45'	20	50	2.02	4	
8507542	1.5	1°	8	45	1.78	4	
8507543	1.5	1°	10	45	1.85	4	
8507544	1.5	1°	12	45	1.92	4	



FXS



## Taper end mills - Miniatur-Konusfräser - Microfresa coniche per nervature - Microfraises coniques

## FXS-RB-TPE



FXS



OSG Europe : www.osgeurope.com

EDP	D	$\alpha_{\Delta}$	l	L	d1	d	€
8507545	1.5	1°	16	50	2.06	4	
8507546	1.5	1°	20	55	2.20	4	
8507642	1.5	1°30'	8	45	1.92	4	
8507643	1.5	1°30'	10	45	2.02	4	
8507644	1.5	1°30'	12	45	2.13	4	
8507645	1.5	1°30'	16	50	2.34	4	
8507646	1.5	1°30'	20	55	2.55	4	
8507742	1.5	2°	8	45	2.06	4	
8507743	1.5	2°	10	45	2.20	4	
8507744	1.5	2°	12	45	2.34	4	
8507745	1.5	2°	16	50	2.62	4	
8507746	1.5	2°	20	55	2.90	4	
8507855	1.5	3°	12	45	2.76	4	
8507857	1.5	3°	20	55	3.60	4	
8507452	1.6	30'	8	45	1.74	4	
8507453	1.6	30'	10	45	1.78	4	
8507454	1.6	30'	12	45	1.81	4	
8507455	1.6	30'	16	50	1.88	4	
8507456	1.6	30'	20	55	1.95	4	
8505752	1.6	45'	8	45	1.81	4	
8505753	1.6	45'	10	45	1.86	4	
8505754	1.6	45'	12	45	1.91	4	
8505755	1.6	45'	16	50	2.02	4	
8505756	1.6	45'	20	55	2.12	4	
8507552	1.6	1°	8	45	1.88	4	
8507553	1.6	1°	10	45	1.95	4	
8507554	1.6	1°	12	45	2.02	4	
8507555	1.6	1°	16	50	2.16	4	
8507556	1.6	1°	20	55	2.30	4	
8507652	1.6	1°30'	8	45	2.02	4	
8507653	1.6	1°30'	10	45	2.12	4	
8507654	1.6	1°30'	12	45	2.23	4	
8507655	1.6	1°30'	16	50	2.44	4	
8507656	1.6	1°30'	20	55	2.65	4	
8507752	1.6	2°	8	45	2.16	4	
8507753	1.6	2°	10	45	2.30	4	
8507754	1.6	2°	12	45	2.44	4	
8507755	1.6	2°	16	50	2.72	4	
8507756	1.6	2°	20	55	3.40	4	
8507860	1.6	3°	12	45	2.86	4	
8507862	1.6	3°	20	55	3.70	4	
8507462	1.8	30'	8	45	1.94	4	
8507463	1.8	30'	10	45	1.98	4	
8507464	1.8	30'	12	45	2.01	4	
8507465	1.8	30'	16	50	2.08	4	
8507466	1.8	30'	20	55	2.15	4	
8505762	1.8	45'	8	45	2.01	4	
8505763	1.8	45'	10	45	2.06	4	
8505764	1.8	45'	12	45	2.11	4	
8505765	1.8	45'	16	50	2.22	4	
8505766	1.8	45'	20	55	2.32	4	
8507562	1.8	1°	8	45	2.08	4	
8507563	1.8	1°	10	45	2.15	4	
8507564	1.8	1°	12	45	2.22	4	
8507565	1.8	1°	16	50	2.36	4	
8507566	1.8	1°	20	55	2.50	4	
8507662	1.8	1°30'	8	45	2.22	4	
8507663	1.8	1°30'	10	45	2.32	4	
8507664	1.8	1°30'	12	45	2.43	4	
8507665	1.8	1°30'	16	50	2.64	4	
8507666	1.8	1°30'	20	55	2.85	4	
8507762	1.8	2°	8	45	2.36	4	
8507763	1.8	2°	10	45	2.50	4	
8507764	1.8	2°	12	45	2.64	4	
8507765	1.8	2°	16	50	2.92	4	
8507766	1.8	2°	20	55	3.20	4	
8507865	1.8	3°	12	45	3.06	4	
8507867	1.8	3°	20	55	3.90	4	
8507473	2	30'	10	45	2.18	4	

EDP	D	$\alpha_{\Delta}$	l	L	d1	d	€
8507474	2	30'	12	45	2.21	4	
8507475	2	30'	16	50	2.28	4	
8507476	2	30'	20	55	2.35	4	
8507477	2	30'	25	55	2.44	4	
8505773	2	45'	10	45	2.26	4	
8505774	2	45'	12	45	2.31	4	
8505775	2	45'	16	50	2.42	4	
8505776	2	45'	20	55	2.52	4	
8505777	2	45'	25	55	2.66	4	
8507573	2	1°	10	45	2.35	4	
8507574	2	1°	12	45	2.42	4	
8507575	2	1°	16	50	2.56	4	
8507576	2	1°	20	55	2.70	4	
8507577	2	1°	25	55	2.87	4	
8507673	2	1°30'	10	45	2.52	4	
8507674	2	1°30'	12	45	2.63	4	
8507675	2	1°30'	16	50	2.84	4	
8507676	2	1°30'	20	55	3.05	4	
8507677	2	1°30'	25	55	3.31	4	
8507773	2	2°	10	45	2.70	4	
8507774	2	2°	12	45	2.84	4	
8507775	2	2°	16	50	3.12	4	
8507776	2	2°	20	55	3.40	4	
8507777	2	2°	25	55	3.75	4	
8507870	2	3°	16	50	3.68	4	
8507872	2	3°	25	60	4.62	4	
8507483	2.5	30'	10	45	2.68	4	
8507484	2.5	30'	12	45	2.71	4	
8507485	2.5	30'	16	50	2.78	4	
8507486	2.5	30'	20	55	2.85	4	
8507487	2.5	30'	25	55	2.94	4	
8507488	2.5	30'	30	60	3.02	4	
8505783	2.5	45'	10	45	2.76	4	
8505784	2.5	45'	12	45	2.81	4	
8505785	2.5	45'	16	45	2.92	4	
8505786	2.5	45'	20	55	3.02	4	
8505787	2.5	45'	25	55	3.16	4	
8505788	2.5	45'	30	60	3.29	4	
8507583	2.5	1°	10	45	2.85	4	
8507584	2.5	1°	12	45	2.92	4	
8507585	2.5	1°	16	50	3.06	4	
8507586	2.5	1°	20	55	3.20	4	
8507587	2.5	1°	25	55	3.38	4	
8507588	2.5	1°	30	60	3.55	4	
8507683	2.5	1°30'	10	45	3.02	4	
8507684	2.5	1°30'	12	45	3.13	4	
8507685	2.5	1°30'	16	50	3.34	4	
8507686	2.5	1°30'	20	55	3.55	4	
8507687	2.5	1°30'	25	55	3.81	4	
8507688	2.5	1°30'	30	65	4.07	4	
8507783	2.5	2°	10	45	3.20	4	
8507784	2.5	2°	12	45	3.34	4	
8507785	2.5	2°	16	50	3.62	4	
8507786	2.5	2°	20	55	3.90	4	
8507787	2.5	2°	25	60	4.25	6	
8507788	2.5	2°	30	65	4.60	6	
8507875	2.5	3°	20	60	4.60	6	
8507877	2.5	3°	30	65	5.64	6	
8505797	3	45'	25	55	3.66	4	
8505799	3	45'	40	80	4.05	6	
8507597	3	1°	25	55	3.87	4	
8507599	3	1°	40	80	4.40	6	
8507697	3	1°30'	25	60	4.31	6	
8507699	3	1°30'	40	80	5.09	6	
8507797	3	2°	25	60	4.75	6	
8507799	3	2°	40	80	5.79	6	
8507807	3	3°	25	60	5.62	6	
8507809	3	3°	40	80	7.19	8	

$\Delta$  taper angle - Grad - angolo di conicità - angle de conicité

FXS-RB-TPE	Applications - Anwendungen - Applicazioni - Applications													
	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS	GG-GGG	Cu	Al	Graphite	Ti	HRS	Plast.	
	⊙	⊙	○	○		○	⊙	○			○			

Taper end mills - Miniatur-Konusfräser - Microfrese coniche per nervature - Microfraises coniques

\* HIGH PERFORMANCE

\* HIGH PERFORMANCE

\* ALTA PERFORMANCE

\* HAUTE PERFORMANCE

FXS-RB-TPB



P. 123

EDP	R	$\alpha_{\Delta}$	l	L	d1	d	€
8509200	0.3	30'	4	35	0.67	3	
8509201	0.3	30'	6	35	0.7	3	
8509600	0.3	45'	4	35	0.7	3	
8509601	0.3	45'	6	35	0.75	3	
8509300	0.3	1°	4	35	0.73	3	
8509301	0.3	1°	6	35	0.8	3	
8509400	0.3	1°30'	4	35	0.78	3	
8509401	0.3	1°30'	6	35	0.9	3	
8509500	0.3	2°	4	35	0.86	3	
8509501	0.3	2°	6	35	1.00	3	
8509211	0.4	30'	6	35	0.90	3	
8509212	0.4	30'	8	45	0.93	4	
8509213	0.4	30'	10	45	0.97	4	
8509611	0.4	45'	6	35	0.95	3	
8509612	0.4	45'	8	45	1.00	4	
8509613	0.4	45'	10	45	1.05	4	
8509311	0.4	1°	6	35	1.00	3	
8509312	0.4	1°	8	45	1.07	4	
8509313	0.4	1°	10	45	1.14	4	
8509411	0.4	1°30'	6	35	1.09	3	
8509412	0.4	1°30'	8	45	1.20	4	
8509413	0.4	1°30'	10	45	1.30	4	
8509511	0.4	2°	6	35	1.19	3	
8509512	0.4	2°	8	45	1.33	4	
8509513	0.4	2°	10	45	1.47	4	
8509222	0.5	30'	8	45	1.13	4	
8509223	0.5	30'	10	45	1.17	4	
8509224	0.5	30'	12	45	1.20	4	
8509622	0.5	45'	8	45	1.20	4	
8509623	0.5	45'	10	45	1.25	4	
8509624	0.5	45'	12	45	1.30	4	
8509322	0.5	1°	8	45	1.26	4	
8509323	0.5	1°	10	45	1.33	4	
8509324	0.5	1°	12	45	1.40	4	
8509422	0.5	1°30'	8	45	1.39	4	
8509423	0.5	1°30'	10	45	1.50	4	
8509424	0.5	1°30'	12	45	1.60	4	
8509522	0.5	2°	8	45	1.53	4	
8509523	0.5	2°	10	45	1.66	4	
8509524	0.5	2°	12	45	1.80	4	
8509232	0.6	30'	8	45	1.33	4	
8509233	0.6	30'	10	45	1.37	4	
8509234	0.6	30'	12	45	1.40	4	
8509235	0.6	30'	16	50	1.47	4	
8509632	0.6	45'	8	45	1.39	4	
8509633	0.6	45'	10	45	1.45	4	
8509634	0.6	45'	12	45	1.50	4	
8509635	0.6	45'	16	50	1.60	4	
8509332	0.6	1°	8	45	1.46	4	
8509333	0.6	1°	10	45	1.53	4	
8509334	0.6	1°	12	45	1.60	4	
8509335	0.6	1°	16	50	1.74	4	
8509432	0.6	1°30'	8	45	1.59	4	
8509433	0.6	1°30'	10	45	1.69	4	

EDP	R	$\alpha_{\Delta}$	l	L	d1	d	€
8509434	0.6	1°30'	12	45	1.80	4	
8509435	0.6	1°30'	16	50	2.01	4	
8509532	0.6	2°	8	45	1.72	4	
8509533	0.6	2°	10	45	1.86	4	
8509534	0.6	2°	12	45	2.00	4	
8509535	0.6	2°	16	50	2.28	4	
8509242	0.75	30'	8	45	1.63	4	
8509243	0.75	30'	10	45	1.66	4	
8509244	0.75	30'	12	45	1.70	4	
8509245	0.75	30'	16	50	1.77	4	
8509246	0.75	30'	20	55	1.84	4	
8509642	0.75	45'	8	45	1.69	4	
8509643	0.75	45'	10	45	1.74	4	
8509644	0.75	45'	12	45	1.80	4	
8509645	0.75	45'	16	50	1.90	4	
8509646	0.75	45'	20	55	2.00	4	
8509342	0.75	1°	8	45	1.75	4	
8509343	0.75	1°	10	45	1.82	4	
8509344	0.75	1°	12	45	1.90	4	
8509345	0.75	1°	16	50	2.03	4	
8509346	0.75	1°	20	55	2.17	4	
8509442	0.75	1°30'	8	45	1.88	4	
8509443	0.75	1°30'	10	45	1.99	4	
8509444	0.75	1°30'	12	45	2.09	4	
8509445	0.75	1°30'	16	50	2.30	4	
8509446	0.75	1°30'	20	55	2.51	4	
8509542	0.75	2°	8	45	2.01	4	
8509543	0.75	2°	10	45	2.15	4	
8509544	0.75	2°	12	45	2.29	4	
8509545	0.75	2°	16	50	2.57	4	
8509546	0.75	2°	20	55	2.85	4	
8509252	0.8	30'	8	45	1.73	4	
8509253	0.8	30'	10	45	1.76	4	
8509254	0.8	30'	12	45	1.80	4	
8509255	0.8	30'	16	50	1.87	4	
8509256	0.8	30'	20	55	1.94	4	
8509652	0.8	45'	8	45	1.79	4	
8509653	0.8	45'	10	45	1.84	4	
8509654	0.8	45'	12	45	1.89	4	
8509655	0.8	45'	16	50	2.00	4	
8509656	0.8	45'	20	55	2.10	4	
8509352	0.8	1°	8	45	1.85	4	
8509353	0.8	1°	10	45	1.92	4	
8509354	0.8	1°	12	45	1.99	4	
8509355	0.8	1°	16	50	2.13	4	
8509356	0.8	1°	20	55	2.27	4	
8509452	0.8	1°30'	8	45	1.98	4	
8509453	0.8	1°30'	10	45	2.08	4	
8509454	0.8	1°30'	12	45	2.19	4	
8509455	0.8	1°30'	16	50	2.40	4	
8509456	0.8	1°30'	20	55	2.61	4	
8509552	0.8	2°	8	45	2.10	4	
8509553	0.8	2°	10	45	2.24	4	
8509554	0.8	2°	12	45	2.38	4	

FXS



## Taper end mills - Miniatur-Konusfräser - Microfresa coniche per nervature - Microfraises coniques

## FXS-RB-TPB



EDP	R	$\alpha_{\Delta}$	l	L	d1	d	€
8509555	0.8	2°	16	50	2.66	4	
8509556	0.8	2°	20	55	2.94	4	
8509262	0.9	30'	8	45	1.92	4	
8509263	0.9	30'	10	45	1.96	4	
8509264	0.9	30'	12	45	1.99	4	
8509265	0.9	30'	16	50	2.06	4	
8509266	0.9	30'	20	55	2.13	4	
8509662	0.9	45'	8	45	1.99	4	
8509663	0.9	45'	10	45	2.04	4	
8509664	0.9	45'	12	45	2.09	4	
8509665	0.9	45'	16	50	2.20	4	
8509666	0.9	45'	20	55	2.30	4	
8509362	0.9	1°	8	45	2.05	4	
8509363	0.9	1°	10	45	2.12	4	
8509364	0.9	1°	12	45	2.19	4	
8509365	0.9	1°	16	50	2.34	4	
8509366	0.9	1°	20	55	2.47	4	
8509462	0.9	1°30'	8	45	2.17	4	
8509463	0.9	1°30'	10	45	2.28	4	
8509464	0.9	1°30'	12	45	2.38	4	
8509465	0.9	1°30'	16	50	2.59	4	
8509466	0.9	1°30'	20	55	2.80	4	
8509562	0.9	2°	8	45	2.30	4	
8509563	0.9	2°	10	45	2.44	4	
8509564	0.9	2°	12	45	2.58	4	
8509565	0.9	2°	16	50	2.86	4	
8509566	0.9	2°	20	55	3.14	4	
8509273	1	30'	10	45	2.16	4	
8509274	1	30'	12	45	2.19	4	
8509275	1	30'	16	50	2.26	4	
8509276	1	30'	20	55	2.33	4	
8509277	1	30'	25	55	2.42	4	
8509673	1	45'	10	45	2.24	4	
8509674	1	45'	12	45	2.29	4	
8509675	1	45'	16	50	2.39	4	
8509676	1	45'	20	55	2.50	4	
8509677	1	45'	25	55	2.63	4	
8509373	1	1°	10	45	2.31	4	
8509374	1	1°	12	45	2.38	4	

EDP	R	$\alpha_{\Delta}$	l	L	d1	d	€
8509375	1	1°	16	50	2.52	4	
8509376	1	1°	20	55	2.66	4	
8509377	1	1°	25	55	2.84	4	
8509473	1	1°30'	10	45	2.47	4	
8509474	1	1°30'	12	45	2.58	4	
8509475	1	1°30'	16	50	2.79	4	
8509476	1	1°30'	20	55	3.00	4	
8509477	1	1°30'	25	55	3.26	4	
8509573	1	2°	10	45	2.63	4	
8509574	1	2°	12	45	2.77	4	
8509575	1	2°	16	50	3.05	4	
8509576	1	2°	20	55	3.33	4	
8509577	1	2°	25	55	3.68	4	
8509283	1.25	30'	10	45	2.65	4	
8509284	1.25	30'	12	45	2.69	4	
8509285	1.25	30'	16	50	2.76	4	
8509286	1.25	30'	20	55	2.83	4	
8509287	1.25	30'	25	55	2.91	4	
8509683	1.25	45'	10	45	2.73	4	
8509684	1.25	45'	12	45	2.78	4	
8509685	1.25	45'	16	50	2.89	4	
8509686	1.25	45'	20	55	2.99	4	
8509687	1.25	45'	25	55	3.12	4	
8509383	1.25	1°	10	45	2.81	4	
8509384	1.25	1°	12	45	2.88	4	
8509385	1.25	1°	16	50	3.02	4	
8509386	1.25	1°	20	55	3.16	4	
8509387	1.25	1°	25	55	3.33	4	
8509483	1.25	1°30'	10	45	2.96	4	
8509484	1.25	1°30'	12	45	3.06	4	
8509485	1.25	1°30'	16	50	3.27	4	
8509486	1.25	1°30'	20	55	3.48	4	
8509487	1.25	1°30'	25	55	3.74	4	
8509583	1.25	2°	10	45	3.11	4	
8509584	1.25	2°	12	45	3.25	4	
8509585	1.25	2°	16	50	3.53	4	
8509586	1.25	2°	20	55	3.81	4	
8509587	1.25	2°	25	60	4.16	6	

Δ taper angle - Grad - angolo di conicità - angle de conicité

FXS



FXS-RB-TPB	Applications - Anwendungen - Applicazioni - Applications													
	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.	
	⊙	⊙	○	○		○	⊙	○			○			

## Taper end mills - Miniatur-Konusfräser - Microfresa coniche per nervature - Microfraises coniques

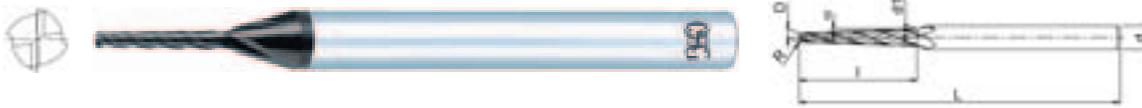
\* HIGH PERFORMANCE

\* HIGH PERFORMANCE

\* ALTA PERFORMANCE

\* HAUTE PERFORMANCE

FXS-RB-TPCR



±5'

P. 123

EDP	D	$\alpha_{\Delta}$	R	L	l	d1	d	€
8545022	1	30'	0.2	45	8	1.14	4	
8545024	1	30'	0.2	45	12	1.21	4	
8545122	1	1°	0.2	45	8	1.28	4	
8545124	1	1°	0.2	45	12	1.42	4	
8545222	1	1°30'	0.2	45	8	1.42	4	
8545224	1	1°30'	0.2	45	12	1.63	4	
8545032	1.2	30'	0.2	45	8	1.34	4	
8545034	1.2	30'	0.2	45	12	1.41	4	
8545132	1.2	1°	0.2	45	8	1.48	4	
8545134	1.2	1°	0.2	45	12	1.62	4	
8545232	1.2	1°30'	0.2	45	8	1.62	4	
8545234	1.2	1°30'	0.2	45	12	1.83	4	
8545042	1.5	30'	0.2	45	8	1.64	4	
8545044	1.5	30'	0.2	45	12	1.71	4	
8545142	1.5	1°	0.2	45	8	1.78	4	
8545144	1.5	1°	0.2	45	12	1.92	4	
8545242	1.5	1°30'	0.2	45	8	1.92	4	
8545244	1.5	1°30'	0.2	45	12	2.13	4	

Δ taper angle - Grad - angolo di conicità - angle de conicité



FXS



FXS-RB-TPCR	Applications - Anwendungen - Applicazioni - Applications													
	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.	
	⊙	⊙	○	○		○	⊙	○			○			

## Ball nose end mills - Kopierfräser - Frese sferiche - Fraises hémisphériques

**NEW**

\* HIGH PERFORMANCE

**NEU**

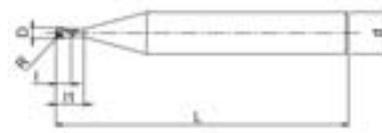
\* HIGH PERFORMANCE

**NUOVO**

\* ALTA PERFORMANCE

**NOUVEAU**

\* HAUTE PERFORMANCE

**CBN-SXB**

P. 136



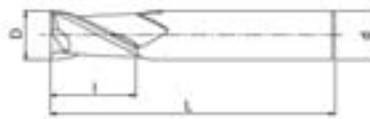
EDP	R	l1	L	l	d	€
8525304	0.2	1.2	45	0.3	4	
8525305	0.25	1.5	45	0.3	4	
8525306	0.3	1.8	45	0.4	4	
8525307	0.35	2.1	45	0.5	4	
8525308	0.4	2.4	45	0.5	4	
8525309	0.45	2.7	45	0.6	4	
8525310	0.5	2.5	45	0.6	4	
8525210	0.5	2.5	50	0.6	6	
8525211	0.55	2.8	50	0.7	6	
8525212	0.6	3	50	0.7	6	
8525213	0.65	3.3	50	0.8	6	
8525214	0.7	3.5	50	0.8	6	
8525215	0.75	3.8	50	0.9	6	
8525216	0.8	4	50	1	6	
8525217	0.85	4.3	50	1	6	
8525218	0.9	4.5	50	1.1	6	
8525219	0.95	4.8	50	1.1	6	
8525220	1	5	50	1.2	6	
8525221	1.05	4.2	50	1.3	6	
8525222	1.1	4.4	50	1.3	6	
8525223	1.15	4.6	50	1.4	6	
8525224	1.2	4.8	50	1.4	6	
8525225	1.25	5	50	1.5	6	
8525226	1.3	5.2	50	1.6	6	
8525227	1.35	5.4	50	1.6	6	
8525228	1.4	5.6	50	1.7	6	
8525229	1.45	5.8	50	1.7	6	
8525230	1.5	6	50	1.8	6	

**CBN**

CBN-SXB	Applications - Anwendungen - Applicazioni - Applications													
	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.	
	○	⊙	⊙	⊙	⊙									

Slotting end mills - 2 Schneiden Schafffräser - Frese per nervature - Fraises à rainurer

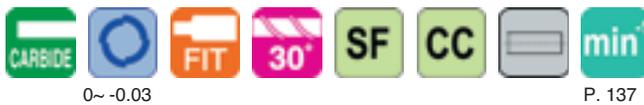
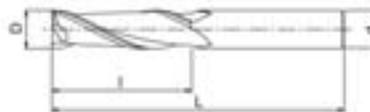
\* HIGH PERFORMANCE \* HIGH PERFORMANCE \* ALTA PERFORMANCE \* HAUTE PERFORMANCE  
**CA-RG-EDS**



EDP	D	L	l	d	€
8502010	1	40	2.5	4	
8502015	1.5	40	4	4	
8502020	2	40	6	4	
8502025	2.5	40	8	4	
8502030	3	45	8	6	
8502035	3.5	45	10	6	
8502040	4	45	11	6	
8502045	4.5	45	11	6	
8502050	5	50	13	6	
8502055	5.5	50	13	6	
8502060	6	50	13	6	
8502065	6.5	60	16	8	
8502070	7	60	16	8	
8502075	7.5	60	16	8	
8502080	8	60	19	8	
8502085	8.5	70	19	10	

EDP	D	L	l	d	€
8502090	9	70	19	10	
8502095	9.5	70	19	10	
8502100	10	70	22	10	
8502105	10.5	75	22	12	
8502110	11	75	22	12	
8502115	11.5	75	22	12	
8502120	12	75	26	12	
8502130	13	85	26	12	
8502140	14	85	26	12	
8502150	15	90	26	16	
8502160	16	100	32	16	
8502170	17	100	32	16	
8502180	18	100	32	16	
8502190	19	100	32	20	
8502200	20	105	38	20	

\* HIGH PERFORMANCE \* HIGH PERFORMANCE \* ALTA PERFORMANCE \* HAUTE PERFORMANCE  
**CA-RG-EDL**



EDP	D	L	l	d	€
8502630	3	50	12	6	
8502635	3.5	50	14	6	
8502640	4	50	17	6	
8502645	4.5	50	17	6	
8502650	5	60	20	6	
8502655	5.5	60	20	6	
8502660	6	60	20	6	
8502665	6.5	70	24	8	
8502670	7	70	24	8	
8502675	7.5	70	24	8	

EDP	D	L	l	d	€
8502680	8	70	28	8	
8502685	8.5	80	28	10	
8502690	9	80	28	10	
8502695	9.5	80	28	10	
8502700	10	80	34	10	
8502705	10.5	90	34	12	
8502710	11	90	34	12	
8502715	11.5	90	34	12	
8502720	12	90	40	12	

Applications - Anwendungen - Applicazioni - Applications	
<b>CA-RG-EDS</b>	~40 HRC ~45 HRC ~55 HRC ~60 HRC ~65 HRC SUS ~35 HRC GG-GGG ~350 HB Cu Al Graphite Ti HRS Plast.
	⊙ ⊙ ⊙ ⊙ ⊙ ⊙ ⊙ ⊙ ⊙ ⊙
<b>CA-RG-EDL</b>	~40 HRC ~45 HRC ~55 HRC ~60 HRC ~65 HRC SUS ~35 HRC GG-GGG ~350 HB Cu Al Graphite Ti HRS Plast.
	⊙ ⊙ ⊙ ⊙ ⊙ ⊙ ⊙ ⊙ ⊙ ⊙

Multiflute end mills - Mehrschneider - Fresa multidenti - Fraises multilèvres

\* HIGH PERFORMANCE \* HIGH PERFORMANCE \* ALTA PERFORMANCE \* HAUTE PERFORMANCE  
**CA-ETS**



EDP	D	L	l	d	€
8502806	3	50	8	6	
8502808	4	50	11	6	
8502810	5	50	13	6	
8502812	6	50	13	6	
8502816	8	60	19	8	
8502820	10	70	22	10	
8502822	12	75	26	12	
8502826	16	100	32	16	
8502830	20	105	38	20	

CA



Applications - Anwendungen - Applicazioni - Applications													
CA-ETS	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
								☉	☉				

## Ball nose end mills - Kopierfräser - Frese sferiche - Fraises hémisphériques

\* HIGH PERFORMANCE

\* HIGH PERFORMANCE

\* ALTA PERFORMANCE

\* HAUTE PERFORMANCE

CAP-EBD



P. 139



EDP	R	D	L	l	d	€
8503410	0.5	1	60	2.5	4	
8503412	0.6	1.2	60	3	4	
8503414	0.7	1.4	60	3.5	4	
8503415	0.75	1.5	60	4	4	
8503416	0.8	1.6	60	4	4	
8503418	0.9	1.8	60	4.5	4	
8503420	1	2	60	5	6	
8503425	1.25	2.5	70	6	6	
8503430	1.5	3	70	8	6	
8503435	1.75	3.5	70	8	6	
8503440	2	4	80	8	6	
8503450	2.5	5	90	10	6	
8503460	3	6	90	12	6	
8503480	4	8	110	14	8	
8503500	5	10	125	18	10	
8503520	6	12	140	22	12	
8503560	8	16	160	30	16	
8503600	10	20	180	38	20	

CA



CAP-EBD	Applications - Anwendungen - Applicazioni - Applications													
	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.	
								☉	☉				☉	

Radius end mills - Mehrschneider mit Eckenradius - Frese toriche - Fraises à rayons

\* HIGH PERFORMANCE \* HIGH PERFORMANCE \* ALTA PERFORMANCE \* HAUTE PERFORMANCE  
**CA-PKE**



EDP	D	R	L	I	l1	d1	d	€
8533033	3	0.5	50	4.5	9	2.7	6	
8533043	4	0.5	50	6	12	3.6	6	
8533053	5	0.5	60	7.5	15	4.5	6	
8533063	6	0.5	60	9	15	5.4	6	
8533065	6	1	60	9	15	5.4	6	
8533083	8	0.5	70	12	20	7.2	8	
8533085	8	1	70	12	20	7.2	8	
8533103	10	0.5	80	15	25	9	10	
8533105	10	1	80	15	25	9	10	
8533123	12	0.5	90	18	30	11	12	
8533125	12	1	90	18	30	11	12	
8533163	16	0.5	115	24	40	15	16	
8533165	16	1	115	24	40	15	16	
8533169	16	3	115	24	40	15	16	
8533203	20	0.5	125	30	50	19	20	
8533205	20	1	125	30	50	19	20	
8533209	20	3	125	30	50	19	20	

CA



\* HIGH PERFORMANCE \* HIGH PERFORMANCE \* ALTA PERFORMANCE \* HAUTE PERFORMANCE  
 \* Radius at both ends of cutting part \* Eckenradius vorne und hinten \* Con raggio anteriore e posteriore \* A rayon avant et arrière

**CA-MFE**



EDP	D	R	L	I	d	€
8532100	10	-	130	15	8	
8532103	10	0.5	130	15	8	
8532105	10	1	130	18	8	
8532120	12	-	150	18	10	
8532123	12	0.5	150	18	10	
8532125	12	1	150	18	10	
8532140	18	-	160	21	12	
8532145	14	1	160	21	12	

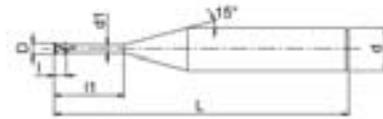
EDP	D	R	L	I	d	€
8532149	14	3	160	21	12	
8532180	18	-	180	27	16	
8532185	18	1	180	27	16	
8532189	18	3	180	27	16	
8532220	22	-	200	33	20	
8532225	22	1	200	33	20	
8532229	22	3	200	33	20	

OSG Europe : www.osgeurope.com

	Applications		Anwendungen		Applicazioni		Applications						
CA-PKE	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
								⊙	⊙				○
CA-MFE	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
								⊙	⊙				○

Slotting end mills - Miniatur-Schafffräser -Microfresa per nervature - Microfraises à rainurer

\* HIGH PERFORMANCE \* HIGH PERFORMANCE \* ALTA PERFORMANCE \* HAUTE PERFORMANCE  
**CRN-LN-EDS**



P. 143

EDP	D	l1	L	l	d1	d	€
8530005	0.5	2.5	60	0.7	0.45	6	
8530008	0.8	4	60	1.2	0.75	6	
8530010	1	5	60	1.5	0.95	6	
8530015	1.5	7.5	60	2.3	1.45	6	
8530020	2	10	60	3	1.95	6	
8530025	2.5	12.5	70	3.7	2.4	6	
8530030	3	15	70	4.5	2.85	6	
8530040	4	20	80	6	3.85	6	
8530050	5	25	90	7.5	4.85	6	
8530060	6	30	90	9	5.85	6	
8530080	8	40	110	12	7.85	8	
8530100	10	50	125	15	9.85	10	
8530120	12	60	140	18	11.85	12	

CrN

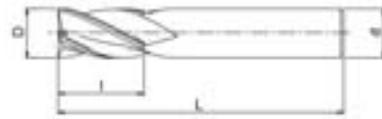


OSG Europe : www.osgeurope.com

CRN-LN-EDS	Applications - Anwendungen - Applicazioni - Applications													
	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.	
								⊙	○				⊙	

Multiflute end mills - Mehrschneider - Fresa multidenti - Fraises multilèvres

\* HIGH PERFORMANCE \* HIGH PERFORMANCE \* ALTA PERFORMANCE \* HAUTE PERFORMANCE  
**CRN-EMS**



0~-0.02

P. 143

EDP	D	L	l	d	€
8530330	3	70	8	6	
8530340	4	80	11	6	
8530350	5	90	13	6	
8530360	6	90	13	6	
8530380	8	110	19	8	
8530400	10	125	22	10	
8530420	12	140	26	12	

CrN



Applications - Anwendungen - Applicazioni - Applications													
CrN-EMS	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
								☉	○				

Ball nose end mills - Kopierfräser - Frese sferiche - Fraises hémisphériques

\* HIGH PERFORMANCE \* HIGH PERFORMANCE \* ALTA PERFORMANCE \* HAUTE PERFORMANCE **CRN-EBD**



P. 144

EDP	R	D	L	l	d	€
8503860	3	6	90	12	6	
8503880	4	8	110	14	8	
8503900	5	10	125	18	10	
8503920	6	12	140	22	12	

P. 69

\* HIGH PERFORMANCE \* HIGH PERFORMANCE \* ALTA PERFORMANCE \* HAUTE PERFORMANCE **CRN-LN-EBD**



P. 144

EDP	R	l1	L	l	d1	d	€
8503810	0.5	5	60	1.5	0.95	6	
8503812	0.6	6	60	1.8	1.15	6	
8503814	0.7	7	60	2.1	1.35	6	
8503815	0.75	7.5	60	2.3	1.45	6	
8503816	0.8	8	60	2.4	1.55	6	
8503818	0.9	9	60	2.7	1.75	6	
8503820	1	10	60	3	1.95	6	
8503825	1.25	12.5	70	3.7	2.4	6	
8503830	1.5	15	70	4.5	2.85	6	
8503835	1.75	17.5	70	5.3	3.35	6	
8503840	2	20	80	6	3.85	6	
8503850	2.5	25	90	7.5	4.85	6	

CrN



OSG Europe : www.osgeurope.com

Applications - Anwendungen - Applicazioni - Applications													
CRN-EBD	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
								⊗	○				○
CRN-LN-EBD	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
								⊗	○				○

## Slotting end mills - 2 Schneiden Schafffräser - Frese per nervature - Fraises à rainurer

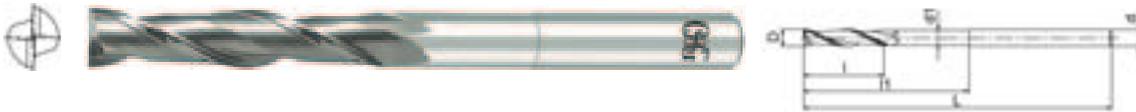
\* HIGH PERFORMANCE

\* HIGH PERFORMANCE

\* ALTA PERFORMANCE

\* HAUTE PERFORMANCE

GF-EDR



0~-0.03



EDP	D	L	l	d	l1	d1	€
8537004	2	75	10	4	20	1.9	
8537006	3	75	15	4	30	2.9	
8537008	4	75	20	4	40	3.9	
8537010	5	100	25	6	50	4.8	
8537012	6	100	30	6	60	5.8	
8537014	7	110	35	6	-	-	
8537016	8	110	40	8	70	7.8	
8537018	9	120	45	8	-	-	
8537020	10	120	50	10	80	9.7	
8537022	11	130	55	10	-	-	
8537024	12	130	65	12	85	11.7	

GF



Applications - Anwendungen - Applicazioni - Applications													
GF-EDR	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
											⊙		

## Ball nose end mills - Kopierfräser - Frese sferiche - Fraises hémisphériques

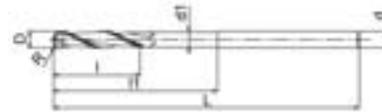
\* HIGH PERFORMANCE  
\* GF ● micro grain carbide

\* HIGH PERFORMANCE  
\* GF ● Hartmetall,  
Feinstkorn

\* ALTA PERFORMANCE  
\* GF ● carburo micrograna

\* HAUTE PERFORMANCE  
\* GF ● carbure micrograin

GF-EBDR



EDP	R	D	L	l	d	l1	d1	€
8537102	1	2	75	10	4	20	1.9	
8537103	1.5	3	75	15	4	30	2.9	
8537104	2	4	75	20	4	40	3.9	
8537105	2.5	5	100	25	6	50	4.8	
8537106	3	6	100	30	6	60	5.8	
8537107	3.5	7	110	35	6	-	-	
8537108	4	8	110	40	8	70	7.8	
8537109	4.5	9	120	45	8	-	-	
8537110	5	10	120	50	10	80	9.7	
8537111	5.5	11	130	55	10	-	-	
8537112	6	12	130	65	12	85	11.7	

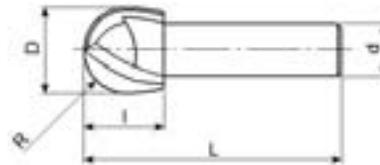
GF



Applications - Anwendungen - Applicazioni - Applications													
GF-EBDR	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
											⊙		

Ball nose end mills - Kopierfräser - Frese sferiche - Fraises hémisphériques

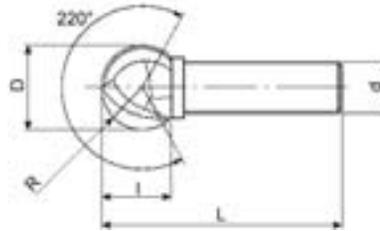
\* HIGH PERFORMANCE \* HIGH PERFORMANCE \* ALTA PERFORMANCE \* HAUTE PERFORMANCE  
**GX-EBD-SF**



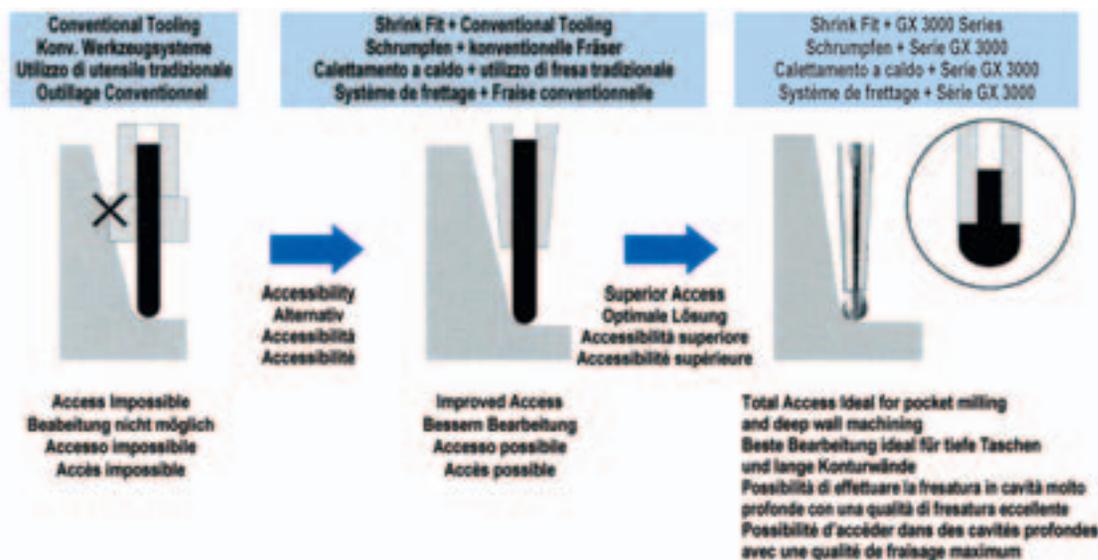
EDP	D	R	L	l	d	€
3000100	10	5	32	10	6	
3000120	12	6	34	12	6	

EDP	D	R	L	l	d	€
3000160	16	8	49	16	10	
3000200	20	10	58	20	12	

\* HIGH PERFORMANCE \* HIGH PERFORMANCE \* ALTA PERFORMANCE \* HAUTE PERFORMANCE  
**GX-EQD-SF**



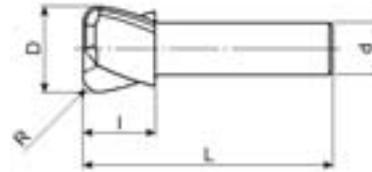
EDP	D	R	L	l	d	€
3002160	16	8	49	12	10	
3002200	20	10	58	15	12	



	Applications - Anwendungen - Applicazioni - Applications													
GX-EBD-SF	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.	
	⊙	⊙				⊙	⊙	○	○					
GX-EQD-SF	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.	
	⊙	⊙				⊙	⊙	○	○					

Slotting end mills - 2 Schneiden Schafffräser - Frese per nervature - Fraises à rainurer

\* HIGH PERFORMANCE \* HIGH PERFORMANCE \* ALTA PERFORMANCE \* HAUTE PERFORMANCE  
**GX-CR-EDS-SF**

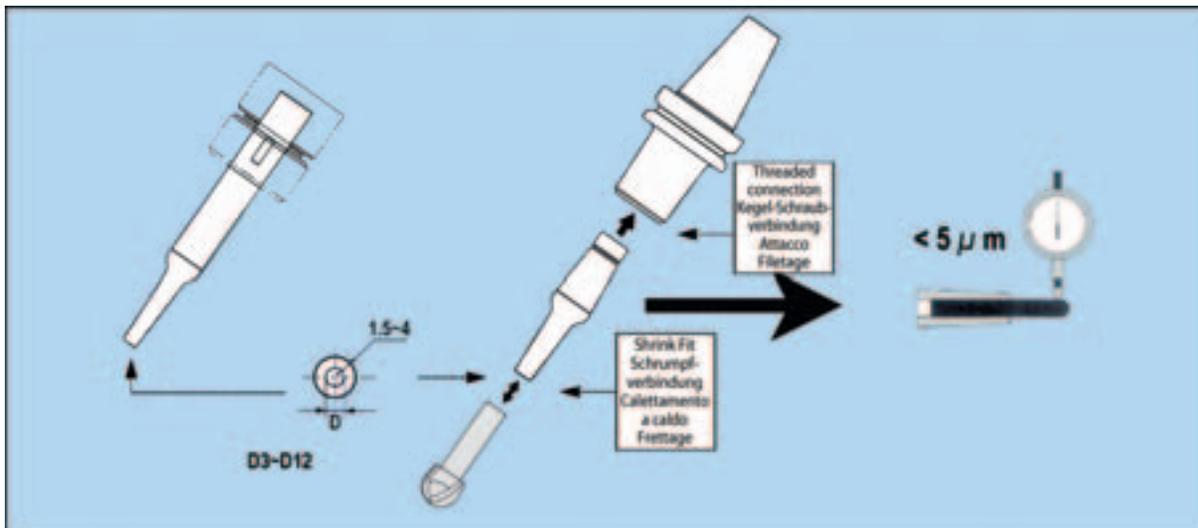


EDP	D	R	L	l	d	€
3001103	10	0.5	32	10	6	
3001105	10	1	32	10	6	
3001123	12	0.5	34	12	6	
3001125	12	1	34	12	6	
3001163	16	0.5	49	16	10	
3001165	16	1	49	16	10	
3001203	20	0.5	58	20	12	
3001205	20	1	58	20	12	

GX



The Hy-Pro Shrink Fit System  
 Aufbaubeispiele - Schrumpfsysteme  
 Il sistema di calettamento a caldo "Hypro"  
 Le système d'attachement cylindrique et modulaire du frettage "Hy-Pro"



OSG Europe : www.osgeurope.com

	Applications		Anwendungen		Applicazioni		Applications						
GX-CR-EDS-SF	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.
	⊙	⊙				⊙	⊙	○	○				

## Ball nose end mills - Kopierfräser - Frese sferiche - Fraises hémisphériques

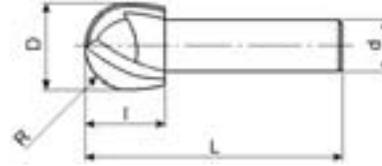
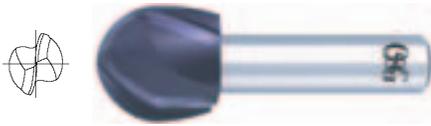
\* HIGH PERFORMANCE

\* HIGH PERFORMANCE

\* ALTA PERFORMANCE

\* HAUTE PERFORMANCE

DIA-EBD-SF



EDP	D	R	L	l	d	€
3003100	10	5	32	11	6	
3003120	12	6	34	13	6	

## DIA



	Applications - Anwendungen - Applicazioni - Applications													
GX-EQD-SF	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.	
	⊙	⊙				⊙	⊙	○	○					
DIA-EBD-SF	~40 HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	SUS ~35 HRC	GG-GGG ~350 HB	Cu	Al	Graphite	Ti	HRS	Plast.	
								○	⊙	⊙				

## Conditions - Schnittwerte - Condizioni - Conditions

## Slotting - Nutenfräsen

WXL-EDS

## Per scanalature profonde - Rainurage



Work material Werkstoff Materiale Matière à usiner	Cu		~35 HRC		35~45 HRC		45~50 HRC	
	S. (min <sup>-1</sup> )	F. (mm/min)						
Ø								
0.1	50.000	100	32.000	70	32.000	60	32.000	30
0.2	50.000	140	32.000	90	32.000	75	32.000	35
0.3	50.000	170	32.000	115	32.000	80	32.000	55
0.4	50.000	190	32.000	125	32.000	90	27.500	60
0.5	50.000	200	31.000	125	25.000	90	22.000	60
0.8	50.000	290	21.500	125	15.500	90	13.500	65
1	47.500	350	17.000	125	12.500	90	11.000	65
1.5	32.000	320	12.500	125	8.900	90	7.950	65
2	24.000	310	9.700	130	7.000	90	6.350	70
3	16.000	400	6.900	175	5.300	100	4.450	75
4	12.000	450	5.450	210	4.250	125	3.500	90
5	9.500	540	4.800	275	3.350	130	3.050	100
6	7.900	530	4.050	275	2.950	130	2.500	100
8	5.900	520	3.000	265	2.200	125	1.900	100
10	4.750	500	2.400	255	1.750	125	1.500	95
12	4.000	510	2.000	255	1.450	125	1.250	95

Max. cutting depth Maximale Schnittiefe Profondità di taglio Profondeur de coupe	$\phi < \phi_1$   6.10	
	$\phi_1 \leq \phi < \phi_2$   6.30	
	$\phi \geq \phi_2$   6.50	

1. Use a rigid and precise machine and holder.
2. When chattering occurs, reduce the speed and feed simultaneously.
3. Use a suitable cutting fluid with high smoke retardant properties.
4. Refer to the table above to set the milling conditions in accordance with the actual situation.
1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spanmittel.
2. Falls Vibrationen auftreten sollten, Vorschub und Schnittgeschwindigkeit reduzieren.
3. Benutzen Sie Kühlmittel mit rauchhemmenden Zusätzen.
4. Entnehmen sie die Schnittdaten entsprechend Ihrer aktuellen Bearbeitungsaufgabe aus der oben gezeigten Tabelle.

1. Utilizzare una macchina ed un mandrino di elevata rigidità e di alta precisione.
2. In caso di vibrazione, ridurre simultaneamente la velocità di taglio e l'avanzamento.
3. Utilizzare dei lubrificanti di taglio adeguanti, dotati di un elevato coefficiente di rallentamento di emissione del fumo.
4. Variare le condizioni della suddetta tabella in conformità alla effettiva situazione.
1. Utiliser une machine et un porte-outil de grande rigidité et de haute précision.
2. Utiliser de l'arrosage en brouillard (mist).
3. Utiliser des fluides de coupes de haute qualité avec un coef. élevé de ralentissement d'émission de fumée.
4. Ajuster la vitesse, avances et la profondeur de coupe en fonction de la précision de la machine ainsi que le chemin de fraisage.

WXL

## Conditions - Schnittwerte - Condizioni - Conditions



WXL-EMS

High speed side milling - HSC Konturfräsen -  
Sgrossatura e contornatura alta velocità - Contournage UGV

Work material Werkstoff Materiale Matière à usiner	Cu		~35 HRC		35~45 HRC		45~50 HRC	
	S. (min <sup>-1</sup> )	F. (mm/min)	FC250 · SS400 · S55C · NAK55 ~35 HRC		SKT · SKD61 · NAK80 · HPM1 · DH 33~41 HRC		SKT · SKD61 · NAK80 · HPM1 · DH 42~50 HRC	
Ø	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
1	50.000	440	24.000	210	14.000	78	12.500	70
1.5	50.000	975	16.000	310	9.250	115	8.400	105
2	47.500	1.100	12.000	295	7.000	110	6.350	100
2.5	38.000	1.900	9.600	480	6.200	140	5.550	125
3	32.000	1.600	8.150	430	5.300	125	4.750	110
4	24.000	1.700	6.050	450	4.250	135	3.700	115
5	19.000	2.000	4.900	520	3.550	140	3.150	125
6	16.000	2.000	4.100	520	2.950	145	2.650	130
8	12.000	1.900	3.050	505	2.200	145	1.950	130
10	9.500	1.900	2.450	505	1.750	145	1.550	130
12	7.900	1.900	2.050	505	1.450	145	1.300	130
14	6.800	1.900	1.750	495	1.250	145	1.100	125
15	6.300	1.900	1.600	490	1.150	135	1.050	120
16	5.900	1.800	1.500	480	1.100	130	995	115
18	5.300	1.800	1.350	470	990	115	880	105
20	4.700	1.700	1.200	445	890	105	795	95
25	3.800	1.400	970	360	710	85	635	75
30	3.100	1.100	815	300	590	70	530	60

Max. cutting depth  
Maximale Schnitttiefe  
Profondità di taglio  
Profondeur de coupe

1. Use a rigid and precise machine and holder.
2. When chattering occurs, reduce the speed and feed simultaneously.
3. Use a suitable cutting fluid with high smoke retardant properties.
4. Refer to the table above to set the milling conditions in accordance with the actual situation.

1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spanmittel.
2. Falls Vibrationen auftreten sollten, Vorschub und Schnittgeschwindigkeit reduzieren.
3. Benutzen Sie Kühlmittel mit rauchhemmenden Zusätzen.
4. Entnehmen sie die Schnittdaten entsprechend Ihrer aktuellen Bearbeitungsaufgabe aus der oben gezeigten Tabelle.

1. Utilizzare una macchina ed un mandrino di elevata rigidità e di alta precisione.
2. In caso di vibrazione, ridurre simultaneamente la velocità di taglio e l'avanzamento.
3. Utilizzare dei lubrificanti di taglio adeguati, dotati di un elevato coefficiente di rallentamento di emissione del fumo.
4. Variare le condizioni della suddetta tabella in conformità alla effettiva situazione.

1. Utiliser une machine et un porte-outil de grande rigidité et de haute précision.
2. Utiliser de l'arrosage en brouillard (mist).
3. Utiliser des fluides de coupes de haute qualité avec un coef. élevé de ralentissement d'émission de fumée.
4. Ajuster la vitesse, avances et la profondeur de coupe en fonction de la précision de la machine ainsi que le chemin de fraiseage.

Work material Werkstoff Materiale Matière à usiner	Cu		~35 HRC		35~45 HRC		45~50 HRC	
	S. (min <sup>-1</sup> )	F. (mm/min)	FC250 · SS400 · S55C · NAK55 ~35 HRC		SKT · SKD61 · NAK80 · HPM1 · DH 33~41 HRC		SKT · SKD61 · NAK80 · HPM1 · DH 42~50 HRC	
Ø	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
6	26.000	2.900	20.000	2.300	13.000	1.500	7.950	795
8	19.500	3.000	14.500	2.300	9.900	1.450	5.950	795
10	15.500	2.900	12.000	2.300	7.950	1.450	4.750	795
12	13.000	3.000	9.900	2.300	6.600	1.450	3.950	790
14	11.000	2.800	8.500	2.200	650	1.350	3.400	740
15	10.500	2.800	7.950	2.150	5.250	1.350	3.150	730
16	9.700	2.700	7.450	2.100	4.950	1.350	2.950	715
18	8.600	2.700	6.600	2.100	4.400	1.300	2.650	705
20	7.800	2.600	5.950	2.000	3.950	1.300	2.350	665
25	6.200	2.000	4.750	1.600	3.150	1.050	1.900	560
30	5.200	1.700	3.950	1.350	2.650	890	1.550	455

Max. cutting depth  
Maximale Schnitttiefe  
Profondità di taglio  
Profondeur de coupe

1. Use a rigid and precise machine and holder.
2. When chattering occurs, reduce the speed and feed simultaneously.
3. Use a suitable cutting fluid with high smoke retardant properties.
4. During dry (no fluid) milling, please use air blow to remove disposable chips from the milling area and to eliminate chip packing.

1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spanmittel.
2. Falls Vibrationen auftreten sollten, Vorschub und Schnittgeschwindigkeit reduzieren.
3. Benutzen Sie Kühlmittel mit rauchhemmenden Zusätzen.
4. Bei Trockenbearbeitung Druckluft zum Entfernen der Späne verwenden.

1. Utilizzare una macchina ed un mandrino di elevata rigidità e di alta precisione.
2. In caso di vibrazione, ridurre simultaneamente la velocità di taglio e l'avanzamento.
3. Utilizzare dei lubrificanti di taglio adeguati, dotati di un elevato coefficiente di rallentamento di emissione del fumo.
4. Durante la fresatura a secco, utilizzare dell'aria.

1. Utiliser une machine et un porte-outil de grande rigidité et de haute précision.
2. Utiliser de l'arrosage en brouillard (mist).
3. Utiliser des fluides de coupes de haute qualité avec un coef. élevé de ralentissement d'émission de fumée.
4. Lors de l'usinage à sec veuillez utiliser de l'air pour l'évacuation des copeaux.

Conditions - Schnittwerte - Condizioni - Conditions

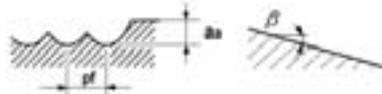
High speed regular milling - HSC Standardfräsen -  
Fresatura alta velocità standard - Fraisage UGV standard

WXL-EBD



Work material Werkstoff Materiale Matière à usiner	Cu				~35 HRC FC250 · SS400 · S55C · NAK55 ~35 HRC				35~45 HRC SKT · SKD61 · NAK80 · HPM1 · DH 33~41 HRC				45~50 HRC SKT · SKD61 · NAK80 · HPM1 · DH 42~50 HRC			
	S. (min <sup>-1</sup> )	F. (mm/min)	aa (mm)	pf (mm)	S. (min <sup>-1</sup> )	F. (mm/min)	aa (mm)	pf (mm)	S. (min <sup>-1</sup> )	F. (mm/min)	aa (mm)	pf (mm)	S. (min <sup>-1</sup> )	F. (mm/min)	aa (mm)	pf (mm)
Ø	40.000	450	0.005	0.02	32.000	380	0.005	0.02	32.000	250	0.005	0.02	32.000	170	0.005	0.01
0.05	40.000	480	0.01	0.04	32.000	400	0.01	0.04	32.000	265	0.01	0.04	32.000	180	0.01	0.02
0.1	40.000	490	0.02	0.08	32.000	410	0.02	0.08	32.000	330	0.04	0.08	32.000	205	0.02	0.04
0.2	40.000	580	0.03	0.12	32.000	490	0.03	0.12	32.000	420	0.06	0.12	32.000	265	0.03	0.06
0.3	40.000	660	0.04	0.16	32.000	550	0.04	0.16	31.500	420	0.08	0.16	27.500	290	0.04	0.08
0.4	40.000	750	0.05	0.2	31.500	620	0.05	0.2	25.000	400	0.1	0.2	22.000	285	0.05	0.1
0.5	19.000	750	0.2	0.4	15.500	620	0.2	0.4	12.500	400	0.2	0.4	11.000	290	0.1	0.2
1	12.500	760	0.3	0.6	10.500	630	0.3	0.6	8.450	405	0.3	0.6	7.400	290	0.15	0.3
1.5	9.500	760	0.4	0.8	7.950	630	0.4	0.8	6.350	445	0.4	0.8	5.550	370	0.2	0.4
2	6.300	800	0.6	1.2	5.300	670	0.6	1.2	4.200	465	0.6	1.2	3.700	390	0.3	0.6
3	4.750	950	0.8	1.6	3.950	790	0.8	1.6	3.150	555	0.8	1.6	2.750	455	0.4	0.8
4	3.800	890	1	2	3.150	745	1	2	2.500	525	1	2	2.200	430	0.5	1
5	3.150	840	1.2	2.4	2.650	700	1.2	2.4	2.100	490	1.2	2.4	1.850	430	0.6	1.2
6	2.400	630	1.6	3.2	2.000	525	1.6	3.2	1.600	370	1.6	3.2	1.400	325	0.8	1.6
8	1.900	500	2	4	1.600	420	2	4	1.250	290	2	4	1.100	260	1	2
10																

Max. cutting depth  
Maximale Schnitttiefe  
Profondità di taglio  
Profondeur de coupe



1. Use a rigid and precise machine and holder.
  2. Use a suitable cutting fluid with high smoke retardant properties.
  3. Refer to the table above to set the milling conditions in accordance with the actual situation.  
\* When the length of tool extension from the machine is long, reduce the speed and feed.
- \*\* When β is less than 15°, speed and feed in the above table can be increased 1,5 to 2 times.

1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spannmittel.
  2. Benutzen Sie Kühlmittel mit rauchhemmenden Zusätzen.
  3. Entnehmen sie die Schnittdaten entsprechend Ihrer aktuellen Bearbeitungsaufgabe aus der oben gezeigten Tabelle.  
\* Bei sehr langen Ausspannlängen, reduzieren sie bitte Schnittgeschwindigkeit und Vorschub.
- \*\* Wenn β kleiner 15° ist, können die in der Tabelle angegebenen Werte um das 1,5 bis 2-fache erhöht werden.

1. Utilizzare una macchina ed un mandrino di elevata rigidità e di alta precisione.
  2. Utilizzare dei lubrificanti di taglio adeguati, dotati di un elevato coefficiente di rallentamento di emissione del fumo.
  3. Variare le condizioni della suddetta tabella in conformità alla effettiva situazione.  
\* Quando la sporgenza dell'utensile dal mandrino macchina è particolarmente lunga, ridurre velocità e avanzamento.
- \*\* Quando β è inferiore a 15°, la velocità e avanzamento sulla suddetta tabella possono essere aumentati di 1,2 a 1,5 volte.

1. Utiliser une machine et un porte-outil de grande rigidité et de haute précision.
  2. Utiliser des fluides de coupes de haute qualité avec un coef. élevé de ralentissement d'émission de fumée.
  3. Ajuster la vitesse, avances et la profondeur de coupe en fonction de la précision de la machine ainsi que le chemin de fraisage.  
\* Dans le cas d'une grande longueur d'outil, réduire vitesse et avance.
- \*\* Quand β est inférieure à 15°, la vitesse et avance citée dans la table ci-dessus, peuvent être augmentée 1,5 ~ 2 fois.

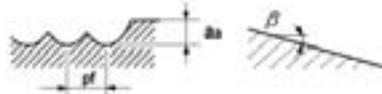
WXL

High speed regular milling - HSC Standardfräsen -  
Fresatura alta velocità standard - Fraisage UGV standard

WXL-EBD

Work material Werkstoff Materiale Matière à usiner	Cu				~35 HRC FC250 · SS400 · S55C · NAK55 ~35 HRC				35~45 HRC SKT · SKD61 · NAK80 · HPM1 · DH 33~41 HRC				45~50 HRC SKT · SKD61 · NAK80 · HPM1 · DH 42~50 HRC			
	S. (min <sup>-1</sup> )	F. (mm/min)	aa (mm)	pf (mm)	S. (min <sup>-1</sup> )	F. (mm/min)	aa (mm)	pf (mm)	S. (min <sup>-1</sup> )	F. (mm/min)	aa (mm)	pf (mm)	S. (min <sup>-1</sup> )	F. (mm/min)	aa (mm)	pf (mm)
Ø	50.000	3.350	0.02	0.05	50.000	2.800	0.02	0.05	50.000	2.500	0.02	0.05	47.500	2.250	0.02	0.05
0.5	39.500	3.350	0.04	0.1	25.000	2.800	0.04	0.1	24.500	2.500	0.04	0.1	23.500	2.250	0.04	0.1
1	26.500	3.350	0.06	0.15	16.500	2.800	0.06	0.15	16.000	2.500	0.06	0.15	15.500	2.250	0.06	0.15
1.5	20.000	4.100	0.08	0.2	15.500	3.400	0.08	0.2	15.000	2.750	0.08	0.2	13.500	2.450	0.08	0.2
2	13.500	5.150	0.12	0.3	13.500	4.300	0.3	0.6	11.500	2.750	0.3	0.6	9.500	2.250	0.12	0.3
3	10.000	3.850	0.16	0.4	10.000	3.200	0.4	0.8	8.950	2.100	0.4	0.8	7.150	1.700	0.16	0.4
4	8.250	3.100	0.2	0.5	8.250	2.600	0.5	1	7.150	1.700	0.5	1	5.700	1.350	0.2	0.5
5	6.850	2.600	0.24	0.6	6.850	2.150	0.5	2.4	5.950	1.400	0.5	2.4	4.750	1.100	0.24	0.6
6	5.150	1.550	0.32	0.8	5.150	1.300	0.5	3.2	4.450	1.050	0.5	3.2	3.550	820	0.32	0.8
8	4.100	1.2550	0.4	1	4.100	1.050	0.5	4	3.550	840	0.5	4	2.850	660	0.32	1
10																

Max. cutting depth  
Maximale Schnitttiefe  
Profondità di taglio  
Profondeur de coupe



1. The indicated speeds and feeds are for high speed/high precision machining centers.
2. Because tools can cause sparks, do not useflammable fluids.
3. We recommend using an air blow. If using cuttingfluids, use a high quality fluid with smoke retardant properties.
4. Refer to the table above to set the milling conditions in accordance with the actual situation.  
\* When β is less than 15°, speed and feed in the above table can be increased 1,2 to 1,5 times.

1. Die Schnittdaten sind nur für HSC - Schlichten mit geeigneten Maschinen und Werkzeugaufnahmen.
2. Weil es während der Bearbeitung zu Funkenflug kommen kann, verwenden Sie keine entzündlichen Kühlmittel.
3. Wir empfehlen Luftdruck als Kühlmittel. Wenn Sie Schneidöl verwenden, bitte geeignetes Kühlmittel mit rauchhemmenden Zusätzen verwenden.
4. Entnehmen sie die Schnittdaten entsprechend Ihrer aktuellen Bearbeitungsaufgabe aus der oben gezeigten Tabelle.  
\* Wenn β kleiner 15° ist, können die in der Tabelle angegebenen Werte um das 1,2 bis 1,5-fache erhöht werden.

1. Utilizzare una macchina ed un mandrino di elevata rigidità e di alta precisione.
2. In caso di vibrazione, ridurre simultaneamente la velocità di taglio e l'avanzamento.
3. Utilizzare dei lubrificanti di taglio adeguati, dotati di un elevato coefficiente di rallentamento di emissione del fumo.
4. Variare le condizioni della suddetta tabella in conformità alla effettiva situazione.  
\* Quando β è inferiore a 15°, la velocità e avanzamento sulla suddetta tabella possono essere aumentati di 1,2 a 1,5 volte.

1. Les vitesses et avances indiquées sont d'application pour l'usinage haute vitesse.
2. Des outils peuvent causer des intencebles, n'utilisez pas des lubrificants inflammable.
3. Nous conseillons l'utilisation de l'air comprimé. En cas d'utilisation des fluides de lubrification, utilisez des produits avec des caractéristique adéquats.
4. Ajuster la vitesse, avances et la profondeur de coupe en fonction de la précision de la machine ainsi que le chemin de fraisage.  
\* Quand β est inférieure à 15°, la vitesse et avance citée dans la table ci-dessus, peuvent être augmentée 1,2 ~ 1,5 fois.

## Conditions - Schnittwerte - Condizioni - Conditions

WXL-LN-EBD

High speed regular milling - HSC Standardfräsen -  
Fresatura alta velocità standard - Fraisage UGV standard

Work material Werkstoff Materiale Matière à usiner		Cu				~35 HRC FC250 · SS400 · S55C · NAK55 ~35 HRC				35~45 HRC SKT · SKD61 · NAK80 · HPM1 · DH 33~41 HRC				45~50 HRC SKT · SKD61 · NAK80 · HPM1 · DH 42~50 HRC			
Ø	Lg (mm)	S. (min <sup>-1</sup> )	F. (mm/min)	aa (mm)	pf (mm)	S. (min <sup>-1</sup> )	F. (mm/min)	aa (mm)	pf (mm)	S. (min <sup>-1</sup> )	F. (mm/min)	aa (mm)	pf (mm)	S. (min <sup>-1</sup> )	F. (mm/min)	aa (mm)	pf (mm)
0.05	0.3	32.000	150	0.005	0.005	32.000	75	0.005	0.005	32.000	50	0.005	0.0005	32.000	35	0.005	0.005
0.05	0.5	32.000	120	0.005	0.005	32.000	60	0.005	0.005	32.000	40	0.005	0.005	32.000	25	0.005	0.005
0.1	0.3	32.000	300	0.02	0.02	32.000	200	0.01	0.01	32.000	200	0.01	0.01	32.000	200	0.005	0.005
0.1	0.5	32.000	300	0.02	0.02	32.000	200	0.01	0.01	32.000	200	0.01	0.01	32.000	200	0.005	0.005
0.1	0.75	32.000	300	0.02	0.02	32.000	200	0.01	0.01	32.000	200	0.01	0.01	32.000	100	0.005	0.005
0.1	1	32.000	150	0.02	0.02	32.000	100	0.01	0.01	32.000	100	0.01	0.01	32.000	80	0.005	0.005
0.1	1.25	32.000	150	0.02	0.02	32.000	100	0.01	0.01	32.000	100	0.01	0.01	32.000	80	0.005	0.005
0.1	1.5	32.000	150	0.02	0.02	32.000	100	0.01	0.01	32.000	100	0.01	0.01	32.000	80	0.005	0.005
0.1	1.75	32.000	150	0.02	0.02	32.000	100	0.01	0.01	32.000	100	0.01	0.01	32.000	80	0.005	0.005
0.1	2	32.000	150	0.01	0.01	32.000	100	0.01	0.01	32.000	100	0.01	0.01	32.000	80	0.005	0.005
0.1	2.5	32.000	75	0.01	0.01	32.000	50	0.005	0.005	32.000	50	0.005	0.005	32.000	40	0.003	0.005
0.1	3	32.000	75	0.01	0.01	32.000	50	0.005	0.005	32.000	50	0.005	0.005	32.000	40	0.003	0.005
0.15	0.5	32.000	600	0.02	0.03	32.000	400	0.01	0.015	32.000	300	0.01	0.015	32.000	300	0.005	0.005
0.15	0.6	32.000	600	0.02	0.03	32.000	400	0.01	0.015	32.000	300	0.01	0.015	32.000	300	0.005	0.005
0.15	0.75	32.000	600	0.02	0.03	32.000	400	0.01	0.015	32.000	300	0.01	0.015	32.000	300	0.005	0.005
0.15	1	32.000	450	0.02	0.03	32.000	300	0.01	0.015	32.000	200	0.01	0.015	32.000	200	0.005	0.005
0.15	1.25	32.000	450	0.02	0.03	32.000	300	0.01	0.015	32.000	200	0.01	0.015	32.000	200	0.005	0.005
0.15	1.5	32.000	450	0.02	0.03	32.000	300	0.01	0.015	32.000	200	0.01	0.015	32.000	200	0.005	0.005
0.15	1.75	32.000	450	0.02	0.03	32.000	300	0.01	0.015	32.000	200	0.01	0.015	32.000	200	0.005	0.005
0.15	2	32.000	450	0.02	0.03	32.000	300	0.01	0.015	32.000	200	0.01	0.015	32.000	200	0.005	0.005
0.15	2.25	32.000	450	0.02	0.02	32.000	300	0.01	0.01	32.000	200	0.01	0.01	32.000	200	0.01	0.01
0.15	2.5	32.000	450	0.02	0.02	32.000	300	0.01	0.01	32.000	200	0.01	0.01	32.000	200	0.01	0.01
0.15	2.75	32.000	450	0.02	0.02	32.000	300	0.01	0.01	32.000	200	0.01	0.01	32.000	200	0.01	0.01
0.15	3	32.000	450	0.02	0.02	32.000	300	0.01	0.01	32.000	200	0.01	0.01	32.000	200	0.005	0.01
0.15	3.5	32.000	270	0.02	0.02	32.000	180	0.01	0.01	32.000	120	0.01	0.01	32.000	120	0.005	0.01
0.15	4	32.000	270	0.02	0.02	32.000	180	0.01	0.01	32.000	120	0.01	0.01	32.000	120	0.005	0.005
0.15	4.5	32.000	270	0.02	0.02	32.000	180	0.01	0.01	32.000	120	0.01	0.01	32.000	120	0.003	0.005
0.15	5	32.000	150	0.01	0.02	32.000	100	0.005	0.01	32.000	70	0.005	0.01	32.000	70	0.003	0.005
0.2	0.5	32.000	750	0.025	0.05	32.000	500	0.015	0.025	32.000	400	0.015	0.02	32.000	400	0.01	0.01
0.2	0.75	32.000	750	0.025	0.05	32.000	500	0.015	0.025	32.000	400	0.015	0.02	32.000	400	0.01	0.01
0.2	1	32.000	600	0.025	0.05	32.000	400	0.015	0.025	32.000	300	0.015	0.02	32.000	300	0.01	0.01
0.2	1.5	32.000	600	0.025	0.05	32.000	400	0.015	0.025	32.000	300	0.015	0.02	32.000	300	0.01	0.01
0.2	2	27.000	450	0.025	0.05	27.000	300	0.015	0.025	27.000	200	0.015	0.02	27.000	200	0.01	0.01
0.2	2.5	27.000	450	0.025	0.05	27.000	300	0.015	0.025	27.000	200	0.015	0.02	27.000	200	0.01	0.01
0.2	3	27.000	450	0.025	0.05	27.000	300	0.015	0.025	27.000	200	0.015	0.02	27.000	200	0.01	0.01
0.2	3.5	27.000	450	0.025	0.05	27.000	300	0.015	0.025	27.000	200	0.015	0.02	27.000	200	0.01	0.01
0.2	4	27.000	450	0.01	0.03	27.000	300	0.005	0.015	27.000	200	0.005	0.012	27.000	200	0.005	0.01
0.2	4.5	24.000	300	0.01	0.03	27.000	200	0.005	0.015	27.000	100	0.005	0.012	27.000	100	0.005	0.01
0.2	5	24.000	300	0.01	0.03	27.000	200	0.005	0.015	27.000	100	0.005	0.012	27.000	100	0.005	0.01
0.2	5.5	21.000	300	0.01	0.02	27.000	200	0.005	0.01	27.000	100	0.005	0.008	27.000	100	0.005	0.005
0.2	6	21.000	150	0.01	0.015	27.000	100	0.005	0.008	27.000	80	0.005	0.006	27.000	80	0.003	0.005
0.25	1	32.000	750	0.04	0.05	32.000	500	0.02	0.025	32.000	400	0.02	0.02	32.000	400	0.01	0.01
0.25	1.5	32.000	750	0.04	0.05	32.000	500	0.02	0.025	32.000	400	0.02	0.02	32.000	400	0.01	0.01
0.25	2	32.000	600	0.04	0.05	32.000	400	0.02	0.025	32.000	300	0.02	0.02	32.000	300	0.01	0.01
0.25	2.5	27.000	450	0.04	0.05	27.000	300	0.02	0.025	27.000	200	0.02	0.02	27.000	200	0.01	0.01
0.25	3	27.000	450	0.04	0.05	27.000	300	0.02	0.025	27.000	200	0.02	0.02	27.000	200	0.01	0.01
0.25	3.5	27.000	450	0.04	0.05	27.000	300	0.02	0.025	27.000	200	0.02	0.02	27.000	200	0.01	0.01
0.25	4	27.000	450	0.04	0.05	27.000	300	0.02	0.025	27.000	200	0.02	0.02	27.000	200	0.01	0.01
0.25	4.5	21.000	300	0.04	0.05	20.000	200	0.02	0.025	20.000	200	0.02	0.02	20.000	200	0.01	0.01
0.25	5	21.000	300	0.04	0.05	20.000	200	0.02	0.025	20.000	150	0.02	0.02	20.000	150	0.01	0.01
0.25	5.5	21.000	300	0.02	0.03	20.000	200	0.01	0.015	20.000	150	0.01	0.01	20.000	150	0.01	0.01
0.25	6	21.000	300	0.02	0.03	20.000	200	0.01	0.015	20.000	150	0.01	0.01	20.000	150	0.01	0.01
0.25	7	21.000	300	0.02	0.03	20.000	200	0.01	0.015	20.000	150	0.01	0.01	20.000	150	0.01	0.01
0.25	8	21.000	300	0.02	0.03	15.000	200	0.01	0.015	15.000	150	0.01	0.01	15.000	150	0.005	0.01
0.25	9	18.000	150	0.02	0.02	15.000	100	0.01	0.01	15.000	80	0.005	0.01	15.000	80	0.005	0.005
0.25	10	18.000	150	0.01	0.01	15.000	100	0.005	0.005	15.000	80	0.005	0.005	15.000	80	0.003	0.005

WXL

## Conditions - Schnittwerte - Condizioni - Conditions

High speed regular milling - HSC Standardfräsen -  
Fresatura alta velocità standard - Fraisage UGV standard

WXL-LN-EBD



Work material Werkstoff Materiale Matière à usiner		Cu				~35 HRC FC250 · SS400 · S55C · NAK55 ~35 HRC				35~45 HRC SKT · SKD61 · NAK80 · HPM1 · DH 33~41 HRC				45~50 HRC SKT · SKD61 · NAK80 · HPM1 · DH 42~50 HRC			
Ø	Lg (mm)	S <sub>c</sub> (min <sup>-1</sup> )	F <sub>c</sub> (mm/min)	a <sub>a</sub> (mm)	pf (mm)	S <sub>c</sub> (min <sup>-1</sup> )	F <sub>c</sub> (mm/min)	a <sub>a</sub> (mm)	pf (mm)	S <sub>c</sub> (min <sup>-1</sup> )	F <sub>c</sub> (mm/min)	a <sub>a</sub> (mm)	pf (mm)	S <sub>c</sub> (min <sup>-1</sup> )	F <sub>c</sub> (mm/min)	a <sub>a</sub> (mm)	pf (mm)
0.3	1	32.000	900	0.045	0.12	32.000	600	0.03	0.06	32.000	500	0.03	0.05	32.000	500	0.03	0.03
0.3	1.5	32.000	900	0.045	0.12	32.000	600	0.03	0.06	32.000	500	0.03	0.05	32.000	500	0.03	0.03
0.3	2	32.000	675	0.045	0.12	32.000	450	0.03	0.06	32.000	300	0.03	0.05	32.000	300	0.03	0.03
0.3	2.5	30.000	675	0.045	0.12	32.000	450	0.03	0.06	32.000	300	0.03	0.05	32.000	300	0.03	0.03
0.3	3	30.000	375	0.045	0.12	25.000	250	0.03	0.06	24.000	200	0.03	0.05	24.000	200	0.03	0.03
0.3	3.5	30.000	375	0.045	0.12	25.000	250	0.03	0.06	24.000	200	0.03	0.04	24.000	200	0.03	0.03
0.3	4	30.000	375	0.045	0.12	25.000	250	0.03	0.06	24.000	200	0.03	0.04	24.000	200	0.03	0.03
0.3	4.5	30.000	375	0.045	0.12	25.000	250	0.03	0.06	24.000	200	0.03	0.04	24.000	200	0.03	0.03
0.3	5	30.000	375	0.045	0.12	25.000	250	0.03	0.06	24.000	200	0.03	0.04	24.000	200	0.02	0.02
0.3	5.5	25.000	300	0.045	0.12	20.000	200	0.03	0.06	20.000	200	0.03	0.04	20.000	200	0.02	0.02
0.3	6	25.000	225	0.045	0.12	20.000	150	0.03	0.06	20.000	150	0.03	0.04	20.000	150	0.02	0.02
0.3	6.5	25.000	225	0.045	0.12	20.000	150	0.03	0.06	20.000	150	0.03	0.04	20.000	150	0.02	0.02
0.3	7	25.000	225	0.045	0.12	20.000	150	0.03	0.06	20.000	150	0.03	0.04	20.000	150	0.02	0.02
0.3	7.5	25.000	225	0.045	0.12	20.000	150	0.03	0.06	20.000	150	0.03	0.04	20.000	150	0.02	0.02
0.3	8	25.000	225	0.045	0.12	20.000	150	0.03	0.06	20.000	150	0.03	0.04	20.000	150	0.02	0.02
0.3	8.5	22.000	225	0.045	0.12	20.000	150	0.03	0.06	20.000	150	0.02	0.04	20.000	150	0.01	0.01
0.3	9	22.000	225	0.03	0.1	20.000	150	0.02	0.05	20.000	150	0.02	0.04	20.000	150	0.01	0.01
0.3	9.5	22.000	225	0.03	0.1	17.000	150	0.02	0.05	17.000	150	0.02	0.04	17.000	150	0.01	0.01
0.3	10	20.000	150	0.025	0.05	17.000	100	0.015	0.025	17.000	100	0.015	0.02	17.000	100	0.005	0.005
0.3	11	20.000	150	0.025	0.05	17.000	100	0.015	0.025	17.000	100	0.01	0.02	17.000	100	0.005	0.005
0.3	12	20.000	120	0.025	0.05	17.000	80	0.015	0.025	17.000	80	0.01	0.012	17.000	80	0.005	0.005
0.4	2	27.000	675	0.06	0.16	23.000	450	0.04	0.08	21.000	300	0.04	0.06	21.000	300	0.04	0.04
0.4	3	27.000	675	0.06	0.16	23.000	450	0.04	0.08	21.000	300	0.04	0.06	21.000	300	0.04	0.04
0.4	4	27.000	675	0.06	0.16	23.000	450	0.04	0.08	21.000	300	0.04	0.06	21.000	300	0.04	0.04
0.4	5	24.000	375	0.06	0.12	21.000	250	0.04	0.06	19.000	200	0.04	0.05	19.000	200	0.02	0.025
0.4	6	24.000	375	0.06	0.12	21.000	250	0.04	0.06	19.000	200	0.04	0.05	19.000	200	0.02	0.025
0.4	7	24.000	375	0.06	0.12	21.000	250	0.04	0.06	19.000	200	0.04	0.05	19.000	200	0.02	0.025
0.4	8	22.000	225	0.06	0.12	19.000	150	0.04	0.06	17.000	150	0.04	0.05	17.000	150	0.02	0.025
0.4	9	22.000	225	0.06	0.12	19.000	150	0.04	0.06	17.000	150	0.04	0.05	17.000	150	0.02	0.025
0.4	10	22.000	225	0.06	0.12	19.000	150	0.04	0.06	17.000	150	0.04	0.05	17.000	150	0.02	0.025
0.4	12	20.000	225	0.06	0.12	19.000	150	0.04	0.06	17.000	150	0.04	0.05	17.000	150	0.02	0.025
0.5	2.5	28.000	900	0.075	0.2	25.000	600	0.05	0.1	21.000	400	0.05	0.08	21.000	400	0.05	0.05
0.5	3	28.000	750	0.075	0.2	25.000	500	0.05	0.1	21.000	300	0.05	0.08	21.000	300	0.05	0.05
0.5	4	28.000	750	0.075	0.2	25.000	500	0.05	0.1	21.000	300	0.05	0.08	21.000	300	0.05	0.05
0.5	5	21.000	450	0.075	0.2	19.000	300	0.05	0.1	16.000	200	0.05	0.08	16.000	200	0.05	0.05
0.5	6	21.000	450	0.075	0.2	19.000	300	0.05	0.1	16.000	200	0.05	0.08	16.000	200	0.05	0.05
0.5	7	21.000	450	0.075	0.15	19.000	300	0.05	0.075	16.000	200	0.05	0.06	16.000	200	0.03	0.03
0.5	8	21.000	450	0.075	0.15	19.000	300	0.05	0.075	16.000	200	0.05	0.06	16.000	200	0.03	0.03
0.5	9	21.000	450	0.075	0.15	19.000	300	0.05	0.075	16.000	200	0.05	0.06	16.000	200	0.03	0.03
0.5	10	18.000	300	0.06	0.12	17.000	200	0.03	0.05	14.000	150	0.03	0.04	14.000	150	0.01	0.015
0.5	12	18.000	300	0.06	0.12	17.000	200	0.03	0.05	14.000	150	0.03	0.04	14.000	150	0.01	0.015
0.5	14	18.000	300	0.06	0.12	17.000	200	0.03	0.05	14.000	150	0.03	0.04	14.000	150	0.01	0.015
0.5	16	16.000	300	0.06	0.12	13.000	200	0.03	0.05	10.000	150	0.03	0.04	10.000	150	0.01	0.015
0.5	18	16.000	300	0.06	0.12	13.000	200	0.03	0.05	10.000	150	0.03	0.04	10.000	150	0.01	0.015
0.5	20	16.000	300	0.06	0.12	13.000	200	0.03	0.05	10.000	150	0.03	0.04	10.000	150	0.01	0.015
0.5	22	16.000	225	0.05	0.05	13.000	150	0.02	0.025	10.000	100	0.02	0.02	10.000	100	0.005	0.005
0.6	4	20.000	750	0.09	0.24	17.000	500	0.06	0.12	14.000	300	0.06	0.1	14.000	300	0.06	0.06
0.6	6	20.000	450	0.09	0.24	17.000	300	0.06	0.12	14.000	200	0.06	0.1	14.000	200	0.06	0.06
0.6	8	20.000	450	0.09	0.24	17.000	300	0.06	0.12	14.000	200	0.06	0.1	14.000	200	0.06	0.06
0.6	10	20.000	450	0.09	0.18	17.000	300	0.06	0.09	14.000	200	0.06	0.07	14.000	200	0.03	0.03
0.6	12	16.000	300	0.09	0.18	14.000	200	0.06	0.09	11.000	150	0.06	0.07	11.000	150	0.03	0.03
0.6	14	16.000	300	0.09	0.18	14.000	200	0.06	0.09	11.000	150	0.06	0.07	11.000	150	0.1	0.03
0.6	16	16.000	300	0.09	0.18	14.000	200	0.06	0.09	11.000	150	0.06	0.07	11.000	150	0.1	0.03
0.6	18	16.000	300	0.09	0.18	14.000	200	0.06	0.09	11.000	150	0.06	0.07	11.000	150	0.1	0.03
0.6	20	16.000	300	0.09	0.28	14.000	200	0.06	0.09	11.000	150	0.06	0.07	11.000	150	0.1	0.03
0.6	24	16.000	300	0.09	0.2	14.000	200	0.06	0.09	11.000	150	0.06	0.07	11.000	150	0.1	0.03

WXL

## Conditions - Schnittwerte - Condizioni - Conditions

WXL-LN-EBD

High speed regular milling - HSC Standardfräsen -  
Fresatura alta velocità standard - Fraisage UGV standard

Work material Werkstoff Materiale Matière à usiner		Cu				~35 HRC FC250 · SS400 · S55C · NAK55 ~35 HRC				35~45 HRC SKT · SKD61 · NAK80 · HPM1 · DH 33~41 HRC				45~50 HRC SKT · SKD61 · NAK80 · HPM1 · DH 42~50 HRC			
Ø	Lg (mm)	S. (min <sup>-1</sup> )	F. (mm/min)	aa (mm)	pf (mm)	S. (min <sup>-1</sup> )	F. (mm/min)	aa (mm)	pf (mm)	S. (min <sup>-1</sup> )	F. (mm/min)	aa (mm)	pf (mm)	S. (min <sup>-1</sup> )	F. (mm/min)	aa (mm)	pf (mm)
0.7	8	18.000	450	0.1	0.28	15.500	300	0.07	0.14	12.000	250	0.07	0.1	12.000	250	0.07	0.07
0.7	12	18.000	450	0.1	0.2	15.500	300	0.07	0.1	12.000	250	0.07	0.08	12.000	250	0.07	0.07
0.7	16	13.000	300	0.09	0.18	12.000	200	0.06	0.09	9.000	150	0.04	0.07	9.000	150	0.01	0.03
0.75	3	20.000	900	0.12	0.3	15.000	600	0.08	0.15	12.000	500	0.08	0.12	12.000	300	0.08	0.1
0.75	4	20.000	900	0.12	0.3	15.000	600	0.08	0.15	12.000	500	0.08	0.12	12.000	300	0.08	0.1
0.75	6	18.000	750	0.12	0.3	15.000	500	0.08	0.15	12.000	350	0.08	0.12	12.000	300	0.08	0.1
0.75	8	17.000	450	0.12	0.3	15.000	300	0.08	0.15	12.000	250	0.08	0.12	12.000	250	0.08	0.1
0.75	10	17.000	450	0.12	0.3	15.000	300	0.08	0.15	12.000	250	0.08	0.12	12.000	250	0.08	0.1
0.75	12	17.000	450	0.12	0.24	15.000	300	0.08	0.12	12.000	250	0.08	0.09	12.000	250	0.05	0.06
0.75	14	17.000	450	0.12	0.24	15.000	300	0.08	0.12	12.000	250	0.08	0.09	12.000	250	0.05	0.06
0.75	16	13.000	300	0.09	0.18	12.000	200	0.06	0.1	9.500	150	0.06	0.07	9.500	150	0.01	0.03
0.75	18	13.000	300	0.09	0.18	12.000	200	0.06	0.1	9.500	150	0.06	0.07	9.500	150	0.01	0.03
0.75	20	13.000	300	0.09	0.18	12.000	200	0.06	0.1	9.500	150	0.06	0.07	9.500	150	0.01	0.03
0.75	22	13.000	300	0.09	0.18	12.000	200	0.06	0.1	9.500	150	0.06	0.07	9.500	150	0.01	0.03
0.75	30	13.000	300	0.09	0.18	12.000	200	0.06	0.1	9.500	150	0.06	0.07	9.500	150	0.01	0.03
0.8	4	20.000	900	0.12	0.32	14.000	600	0.08	0.16	11.000	500	0.08	0.13	11.000	350	0.08	0.1
0.8	8	16.500	450	0.12	0.32	14.000	300	0.08	0.16	11.000	250	0.08	0.13	11.000	250	0.08	0.1
0.8	12	16.500	450	0.12	0.24	14.000	300	0.08	0.12	11.000	250	0.08	0.08	11.000	250	0.05	0.05
0.8	16	11.500	300	0.12	0.24	11.000	200	0.08	0.12	9.000	150	0.08	0.08	9.000	150	0.05	0.05
0.8	20	11.500	300	0.09	0.2	11.000	200	0.06	0.12	9.000	150	0.06	0.075	9.000	150	0.015	0.03
0.9	8	16.500	600	0.13	0.36	14.000	400	0.09	0.18	11.000	300	0.09	0.16	11.000	300	0.09	0.12
0.9	12	16.500	600	0.13	0.36	14.000	400	0.09	0.18	11.000	300	0.09	0.16	11.000	300	0.09	0.12
0.9	16	16.500	600	0.13	0.27	14.000	400	0.09	0.14	11.000	300	0.09	0.12	11.000	300	0.05	0.06
0.9	20	11.000	300	0.1	0.22	11.000	200	0.06	0.13	8.000	200	0.06	0.08	8.000	200	0.02	0.03
1	3	16.500	1.350	0.15	0.56	16.500	900	0.1	0.28	13.500	800	0.1	0.28	13.500	700	0.1	0.2
1	4	16.500	1.050	0.15	0.56	16.500	700	0.1	0.28	13.500	500	0.1	0.28	13.500	500	0.1	0.2
1	6	16.500	1.050	0.15	0.56	16.500	700	0.1	0.28	13.500	500	0.1	0.28	13.500	500	0.1	0.2
1	8	16.500	1.050	0.15	0.56	16.500	700	0.1	0.28	13.500	500	0.1	0.28	13.500	500	0.1	0.2
1	10	14.000	750	0.15	0.56	13.000	500	0.1	0.28	10.000	300	0.1	0.28	10.000	300	0.1	0.2
1	12	14.000	750	0.15	0.56	13.000	500	0.1	0.28	10.000	300	0.1	0.28	10.000	300	0.1	0.2
1	14	14.000	750	0.15	0.56	13.000	500	0.1	0.28	10.000	300	0.1	0.28	10.000	300	0.1	0.2
1	16	14.000	750	0.15	0.42	13.000	500	0.1	0.21	10.000	300	0.1	0.18	10.000	300	0.06	0.1
1	18	14.000	750	0.15	0.42	13.000	500	0.1	0.21	10.000	300	0.1	0.18	10.000	300	0.06	0.1
1	20	11.000	375	0.15	0.42	10.000	250	0.1	0.21	8.000	200	0.1	0.18	8.000	200	0.06	0.1
1	22	11.000	375	0.15	0.42	10.000	250	0.1	0.21	8.000	200	0.1	0.18	8.000	200	0.06	0.1
1	25	11.000	375	0.15	0.42	10.000	250	0.1	0.21	8.000	200	0.1	0.18	8.000	200	0.06	0.1
1	30	11.000	375	0.15	0.42	10.000	250	0.1	0.21	8.000	200	0.1	0.18	8.000	200	0.06	0.1
1	35	10.000	375	0.15	0.42	10.000	250	0.1	0.21	8.000	200	0.1	0.18	8.000	200	0.06	0.1
1	40	10.000	300	0.15	0.42	10.000	200	0.1	0.21	8.000	160	0.1	0.18	8.000	160	0.06	0.1
1.25	6	16.000	1.050	0.18	0.7	12.000	700	0.12	0.35	10.000	600	0.12	0.3	10.000	600	0.1	0.25
1.25	10	14.000	1.050	0.18	0.7	12.000	700	0.12	0.35	10.000	600	0.12	0.3	10.000	600	0.1	0.25
1.25	15	14.000	600	0.18	0.7	10.000	400	0.12	0.35	8.500	300	0.12	0.3	8.500	300	0.1	0.25
1.25	20	12.000	600	0.18	0.56	10.000	400	0.12	0.28	8.500	300	0.12	0.2	8.500	300	0.08	0.15
1.25	25	12.000	450	0.18	0.56	8.000	300	0.12	0.28	6.500	250	0.12	0.2	6.500	250	0.08	0.15
1.25	30	12.000	375	0.18	0.56	8.000	250	0.12	0.28	6.500	200	0.12	0.2	6.500	200	0.08	0.15
1.25	35	12.000	375	0.18	0.56	8.000	250	0.12	0.28	6.500	200	0.12	0.2	6.500	200	0.08	0.15
1.5	6	15.000	1.200	0.2	0.84	9.500	800	0.15	0.42	7.500	600	0.15	0.42	7.500	600	0.15	0.3
1.5	8	12.000	900	0.2	0.84	9.500	600	0.15	0.42	7.500	400	0.15	0.36	7.500	400	0.15	0.3
1.5	10	12.000	900	0.2	0.84	9.500	600	0.15	0.42	7.500	400	0.15	0.36	7.500	400	0.15	0.3
1.5	12	10.000	900	0.2	0.84	9.500	600	0.15	0.42	7.500	400	0.15	0.36	7.500	400	0.15	0.3
1.5	14	10.000	900	0.2	0.84	9.500	600	0.15	0.42	7.500	400	0.15	0.36	7.500	400	0.15	0.3
1.5	15	10.000	600	0.2	0.84	8.500	400	0.15	0.42	6.500	250	0.15	0.36	6.500	250	0.15	0.3
1.5	16	10.000	450	0.2	0.84	8.500	300	0.15	0.42	6.500	250	0.15	0.36	6.500	250	0.15	0.3
1.5	20	10.000	450	0.2	0.84	8.500	300	0.15	0.42	6.500	250	0.15	0.36	6.500	250	0.15	0.3
1.5	25	10.000	450	0.2	0.84	8.500	300	0.15	0.42	6.500	250	0.15	0.3	6.500	250	0.09	0.15
1.5	30	9.000	375	0.2	0.84	7.500	250	0.15	0.42	6.000	200	0.15	0.3	6.000	200	0.09	0.15
1.5	35	9.000	375	0.2	0.84	7.500	250	0.15	0.42	6.000	200	0.15	0.3	6.000	200	0.09	0.15
1.5	40	9.000	375	0.2	0.84	7.500	250	0.15	0.42	6.000	200	0.15	0.3	6.000	200	0.09	0.15

WXL

## Conditions - Schnittwerte - Condizioni - Conditions

High speed regular milling - HSC Standardfräsen -  
Fresatura alta velocità standard - Fraisage UGV standard

WXL-LN-EBD



Work material Werkstoff Materiale Matière à usiner		Cu				~35 HRC FC250 · SS400 · S55C · NAK55 ~35 HRC				35~45 HRC SKT · SKD61 · NAK80 · HPM1 · DH 33~41 HRC				45~50 HRC SKT · SKD61 · NAK80 · HPM1 · DH 42~50 HRC			
Ø	Lg (mm)	S <sub>c</sub> (min <sup>-1</sup> )	F <sub>c</sub> (mm/min)	a <sub>a</sub> (mm)	pf (mm)	S <sub>c</sub> (min <sup>-1</sup> )	F <sub>c</sub> (mm/min)	a <sub>a</sub> (mm)	pf (mm)	S <sub>c</sub> (min <sup>-1</sup> )	F <sub>c</sub> (mm/min)	a <sub>a</sub> (mm)	pf (mm)	S <sub>c</sub> (min <sup>-1</sup> )	F <sub>c</sub> (mm/min)	a <sub>a</sub> (mm)	pf (mm)
1.75	10	10.000	1.050	0.4	0.98	8.500	700	0.15	0.42	6.500	500	0.15	0.42	6.500	500	0.15	0.35
1.75	15	10.000	900	0.4	0.98	8.500	600	0.15	0.42	6.500	400	0.15	0.42	6.500	400	0.15	0.35
1.75	20	8.000	750	0.4	0.98	7.500	500	0.15	0.49	5.500	300	0.15	0.42	5.500	300	0.15	0.35
1.75	25	8.000	600	0.4	0.98	7.500	400	0.15	0.49	5.500	275	0.15	0.42	5.500	275	0.15	0.35
1.75	30	8.000	450	0.4	0.98	7.500	300	0.15	0.49	5.500	250	0.15	0.35	5.500	250	0.1	0.2
1.75	35	8.000	375	0.4	0.98	6.000	250	0.15	0.49	5.000	200	0.15	0.35	5.000	200	0.1	0.2
1.75	40	6.000	375	0.3	0.98	6.000	250	0.15	0.49	5.000	200	0.15	0.35	5.000	200	0.1	0.2
1.75	45	6.000	375	0.3	0.98	6.000	250	0.15	0.49	5.000	200	0.15	0.35	5.000	200	0.1	0.2
2	8	11.000	1.200	0.5	1.28	7.500	800	0.2	0.64	6.000	700	0.2	0.6	6.000	700	0.2	0.4
2	10	9.000	900	0.5	1.28	7.500	600	0.2	0.64	6.000	400	0.2	0.6	6.000	400	0.2	0.4
2	12	9.000	900	0.5	1.28	7.500	600	0.2	0.64	6.000	400	0.2	0.6	6.000	400	0.2	0.4
2	14	9.000	900	0.5	1.28	7.500	600	0.2	0.64	6.000	400	0.2	0.6	6.000	400	0.2	0.4
2	15	9.000	900	0.5	1.28	7.500	600	0.2	0.64	6.000	400	0.2	0.6	6.000	400	0.2	0.4
2	16	9.000	900	0.5	1.28	7.500	600	0.2	0.64	6.000	400	0.2	0.6	6.000	400	0.2	0.4
2	20	7.000	600	0.5	1.28	6.000	400	0.2	0.64	5.000	250	0.2	0.6	5.000	250	0.2	0.4
2	25	7.000	600	0.5	1.28	6.000	400	0.2	0.64	5.000	250	0.2	0.6	5.000	250	0.2	0.4
2	30	7.000	600	0.4	1.28	6.000	400	0.2	0.64	5.000	250	0.2	0.56	5.000	250	0.12	0.2
2	35	7.000	600	0.4	1.28	6.000	400	0.2	0.64	5.000	250	0.2	0.56	5.000	250	0.12	0.2
2	40	5.000	375	0.35	1.28	5.000	250	0.2	0.64	4.000	200	0.2	0.56	4.000	200	0.12	0.2
2	45	5.000	375	0.35	1.28	5.000	250	0.2	0.64	4.000	200	0.2	0.56	4.000	200	0.12	0.2
2	50	5.000	375	0.35	1.28	5.000	250	0.2	0.64	4.000	200	0.2	0.56	4.000	200	0.12	0.2
2.5	10	9.000	1.350	0.6	1.8	6.500	900	0.25	0.9	5.000	750	0.25	0.7	5.000	750	0.25	0.5
2.5	15	9.000	1.350	0.6	1.8	6.500	900	0.25	0.9	5.000	750	0.25	0.7	5.000	750	0.25	0.5
2.5	20	7.000	750	0.6	1.8	6.500	500	0.25	0.9	5.000	400	0.25	0.7	5.000	400	0.25	0.5
2.5	25	6.000	750	0.6	1.8	5.000	500	0.25	0.9	4.000	250	0.25	0.7	4.000	250	0.25	0.5
2.5	30	6.000	750	0.6	1.8	5.000	500	0.25	0.9	4.000	250	0.25	0.7	4.000	250	0.25	0.5
2.5	35	6.000	750	0.6	1.8	5.000	500	0.25	0.9	4.000	250	0.25	0.7	4.000	250	0.25	0.5
2.5	40	5.000	600	0.4	1.8	4.000	400	0.25	0.9	4.000	200	0.25	0.6	4.000	200	0.2	0.25
2.5	45	5.000	600	0.4	1.8	4.000	400	0.25	0.9	4.000	200	0.25	0.6	4.000	200	0.2	0.25
2.5	50	5.000	450	0.4	1.8	4.000	300	0.25	0.9	4.000	200	0.25	0.6	4.000	200	0.2	0.25
3	10	7.000	1.500	0.75	2.4	5.500	1.000	0.3	1.2	4.500	800	0.3	0.96	4.500	800	0.3	0.6
3	20	7.000	1.200	0.75	2.4	5.500	800	0.3	1.2	4.500	600	0.3	0.96	4.500	600	0.3	0.6
3	25	6.000	900	0.75	2.4	5.500	600	0.3	1.2	4.500	400	0.3	0.96	4.500	400	0.3	0.6
3	30	5.000	600	0.75	2.4	4.000	400	0.3	1.2	4.000	300	0.3	0.96	4.000	300	0.3	0.6
3	35	5.000	600	0.75	2.4	4.000	400	0.3	1.2	4.000	300	0.3	0.96	4.000	300	0.3	0.6
3	40	5.000	600	0.6	2.4	4.000	400	0.3	1.2	4.000	300	0.3	0.96	4.000	300	0.3	0.6
3	45	5.000	600	0.6	2.4	4.000	400	0.3	1.2	4.000	300	0.3	0.96	4.000	300	0.3	0.6
3	50	5.000	600	0.6	2.4	4.000	400	0.3	1.2	4.000	300	0.3	0.96	4.000	300	0.3	0.6
Max. cutting depth Maximale Schnitttiefe Profondità di taglio Profondeur de coupe																	

- Use a rigid and precise machine and holder.
- When machining carbon steels or hardened steels, using MQL (Minimum Quantity Lubrication / mist coolant) is recommended.
- Please adjust conditions based on machining accuracy, machining shape and machining path.
- When using a tool with a diameter of  $\varnothing 0.5$  (R0.25) or less, or an L/D (effective length/tool diameter) ratio greater than 10, high loads can cause tool breakage. Therefore, adjust the cutting conditions based on the machining situation.
- When the available RPM are insufficient, please reduce the RPM and feed rates in proportion.

- Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spannmittel.
- Wir empfehlen Luft-oder Minimalmengen Kühlung für bearbeitung wie Kohlenstoffstahl und Gehärteter Stahl.
- Bitte regulieren Sie Schnittgeschwindigkeit, Vorschub und Spanntiefe entsprechend Ihrer aktuellen Zerspannungbedingungen.
- Schnittwerte sind für Werkzeugen mit  $\varnothing > 0.5$  (R0.25), und L/D ratio. (Länge/dia)  $< 10$ . Bei andere Auskräglängen müssen Schnittgeschwindigkeit, Vorschub und Spanntiefe verändert werden.
- Bitte regulieren Sie Schnittgeschwindigkeit und Vorschub.

- Utilizzare una macchina ed un mandrino di elevata rigidità e di alta precisione.
- Suggeriamo l'utilizzo di aria compressa o lubrificazione minimale (misto olio).
- Regolare la velocità, l'avanzamento e la profondità di taglio secondo le attuali condizioni di taglio.
- Queste condizioni di fresatura di freze  $\varnothing > 0.5$  (R0.25), L/D ratio. (lunga/dia)  $< 10$ . Per sporgenze ridurre velocità, l'avanzamento e la profondità di taglio.
- Regolare la velocità, l'avanzamento e la profondità di taglio.

- Utiliser une machine et un porte-outil de grande rigidité et de haute précision.
- Utiliser de l'arrosage en brouillard (mist).
- Ajuster la vitesse, avances et la profondeur de coupe en fonction de la précision de la machine ainsi que le chemin de fraisage.
- Les conditions de coupes ci-dessus sont pour l'utilisation d'outil avec un  $\varnothing > 0.5$  (R0.25), et un ratio L/D (longueur/dia)  $< 10$ . Ajuster ces conditions de coupes si nécessaire.
- Ajuster la vitesse, avances et la profondeur de coupe.

WXL

Conditions - Schnittwerte - Condizioni - Conditions

WXL-LN-EBD

High-speed light milling - HSC Schlichtfräsen -  
Fresatura alta velocità - Fraisage UGV



Work material Werkstoff Materiale Matière à usiner		Cu				~35 HRC FC250 · SS400 · S55C · NAK55 ~35 HRC				35~45 HRC SKT · SKD61 · NAK80 · HPM1 · DH 33~41 HRC				45~50 HRC SKT · SKD61 · NAK80 · HPM1 · DH 42~50 HRC			
Ø	Lg (mm)	S. (min <sup>-1</sup> )	F. (mm/min)	aa (mm)	pf (mm)	S. (min <sup>-1</sup> )	F. (mm/min)	aa (mm)	pf (mm)	S. (min <sup>-1</sup> )	F. (mm/min)	aa (mm)	pf (mm)	S. (min <sup>-1</sup> )	F. (mm/min)	aa (mm)	pf (mm)
0.05	0.3	50.000	280	0.003	0.005	50.000	150	0.003	0.003	50.000	100	0.003	0.003	50.000	70	0.003	0.003
0.05	0.5	50.000	220	0.003	0.005	50.000	120	0.003	0.003	50.000	80	0.003	0.003	50.000	50	0.003	0.003
0.1	0.3	50.000	490	0.0075	0.01	50.000	400	0.005	0.005	50.000	380	0.005	0.005	50.000	380	0.005	0.005
0.1	0.5	50.000	490	0.0075	0.01	50.000	400	0.005	0.005	50.000	380	0.005	0.005	50.000	380	0.005	0.005
0.1	0.75	50.000	440	0.0075	0.01	50.000	360	0.005	0.005	50.000	340	0.005	0.005	50.000	340	0.005	0.005
0.1	1	50.000	440	0.0075	0.01	50.000	360	0.005	0.005	50.000	340	0.005	0.005	50.000	340	0.005	0.005
0.1	1.25	50.000	390	0.0075	0.01	47.000	320	0.005	0.005	47.000	300	0.005	0.005	47.000	300	0.005	0.005
0.1	1.5	50.000	360	0.0075	0.01	45.000	300	0.005	0.005	45.000	280	0.005	0.005	45.000	280	0.005	0.005
0.1	1.75	50.000	350	0.0075	0.01	42.000	260	0.005	0.005	42.000	240	0.005	0.005	42.000	240	0.005	0.005
0.1	2	50.000	320	0.0075	0.01	38.000	230	0.005	0.005	38.000	210	0.005	0.005	37.000	200	0.005	0.005
0.15	0.5	50.000	750	0.0075	0.02	50.000	620	0.005	0.01	50.000	600	0.005	0.01	50.000	600	0.005	0.01
0.15	0.6	50.000	730	0.0075	0.02	50.000	600	0.005	0.01	50.000	570	0.005	0.01	50.000	570	0.005	0.01
0.15	0.75	50.000	730	0.0075	0.02	50.000	600	0.005	0.01	50.000	570	0.005	0.01	50.000	570	0.005	0.01
0.15	1	50.000	730	0.0075	0.02	50.000	600	0.005	0.01	50.000	570	0.005	0.01	50.000	570	0.005	0.01
0.15	1.25	50.000	730	0.0075	0.02	50.000	600	0.005	0.01	50.000	570	0.005	0.01	50.000	570	0.005	0.01
0.15	1.5	50.000	730	0.0075	0.02	50.000	600	0.005	0.01	50.000	570	0.005	0.01	50.000	570	0.005	0.01
0.15	1.75	50.000	610	0.0075	0.02	47.000	510	0.005	0.01	47.000	480	0.005	0.01	47.000	480	0.005	0.01
0.15	2	50.000	580	0.0075	0.01	45.000	480	0.005	0.005	45.000	450	0.005	0.005	45.000	450	0.005	0.005
0.15	2.25	50.000	490	0.0075	0.01	45.000	400	0.005	0.005	45.000	380	0.005	0.005	45.000	380	0.005	0.005
0.15	2.5	50.000	360	0.0075	0.01	40.000	300	0.005	0.005	40.000	280	0.005	0.005	40.000	280	0.005	0.005
0.15	2.75	50.000	320	0.0075	0.01	38.000	250	0.005	0.005	38.000	230	0.005	0.005	38.000	230	0.005	0.005
0.15	3	50.000	290	0.0075	0.01	38.000	250	0.005	0.005	38.000	230	0.005	0.005	37.000	230	0.005	0.005
0.2	0.5	50.000	1.100	0.015	0.04	50.000	920	0.02	0.01	50.000	870	0.01	0.02	50.000	870	0.01	0.02
0.2	0.75	50.000	1.090	0.015	0.04	50.000	900	0.02	0.01	50.000	850	0.01	0.02	50.000	850	0.01	0.02
0.2	1	50.000	1.090	0.015	0.04	50.000	900	0.02	0.01	50.000	850	0.01	0.02	50.000	850	0.01	0.02
0.2	1.5	50.000	970	0.015	0.04	50.000	800	0.02	0.01	50.000	760	0.01	0.02	50.000	760	0.01	0.02
0.2	2	50.000	850	0.015	0.04	50.000	700	0.02	0.01	50.000	660	0.01	0.02	50.000	660	0.01	0.02
0.2	2.5	50.000	670	0.012	0.03	45.000	550	0.015	0.008	45.000	520	0.008	0.015	45.000	520	0.008	0.015
0.2	3	48.000	540	0.0075	0.02	43.000	500	0.005	0.01	43.000	470	0.005	0.01	43.000	470	0.005	0.01
0.2	3.5	45.000	460	0.0075	0.02	40.000	420	0.005	0.01	40.000	400	0.005	0.01	40.000	400	0.005	0.01
0.2	4	40.000	400	0.0075	0.01	36.000	370	0.005	0.005	36.000	350	0.005	0.005	35.000	340	0.005	0.005
0.25	1	50.000	1.420	0.0225	0.045	50.000	1.100	0.015	0.03	50.000	1.050	0.015	0.03	50.000	1.050	0.015	0.03
0.25	1.5	50.000	1.420	0.0225	0.045	50.000	1.100	0.015	0.03	50.000	1.050	0.015	0.03	50.000	1.050	0.015	0.03
0.25	2	50.000	1.400	0.0225	0.045	50.000	1.000	0.015	0.03	50.000	950	0.015	0.03	50.000	950	0.015	0.03
0.25	2.5	50.000	1.380	0.0225	0.045	50.000	1.000	0.015	0.03	50.000	950	0.015	0.03	50.000	950	0.015	0.03
0.25	3	50.000	1.190	0.015	0.04	48.000	900	0.01	0.02	48.000	850	0.01	0.02	48.000	850	0.01	0.02
0.25	3.5	50.000	1.140	0.015	0.04	45.000	700	0.01	0.02	45.000	650	0.01	0.02	45.000	650	0.01	0.02
0.25	4	45.000	1.000	0.015	0.02	43.000	600	0.01	0.01	43.000	570	0.01	0.01	43.000	570	0.01	0.01
0.25	4.5	38.000	940	0.015	0.02	38.000	500	0.01	0.01	38.000	470	0.01	0.01	38.000	470	0.01	0.01
0.25	5	30.000	760	0.0075	0.02	30.000	400	0.005	0.01	30.000	380	0.005	0.01	29.000	360	0.005	0.01
0.3	1	50.000	1.660	0.045	0.1	50.000	1.400	0.03	0.05	50.000	1.300	0.03	0.05	50.000	1.300	0.03	0.05
0.3	1.5	50.000	1.600	0.045	0.1	50.000	1.300	0.03	0.05	50.000	1.200	0.03	0.05	50.000	1.200	0.03	0.05
0.3	2	50.000	1.600	0.045	0.1	50.000	1.300	0.03	0.05	50.000	1.200	0.03	0.05	50.000	1.200	0.03	0.05
0.3	2.5	50.000	1.550	0.045	0.1	50.000	1.200	0.03	0.05	50.000	1.100	0.03	0.05	50.000	1.100	0.03	0.05
0.3	3	50.000	1.550	0.03	0.06	50.000	1.200	0.02	0.03	50.000	1.100	0.02	0.03	50.000	1.100	0.02	0.03
0.3	3.5	50.000	1.340	0.03	0.06	45.000	1.000	0.02	0.03	45.000	950	0.02	0.03	45.000	950	0.02	0.03
0.3	4	50.000	1.200	0.015	0.04	40.000	900	0.01	0.02	40.000	850	0.01	0.02	40.000	850	0.01	0.02
0.3	4.5	45.000	1.040	0.015	0.04	34.000	780	0.01	0.02	34.000	740	0.01	0.02	34.000	740	0.01	0.02
0.3	5	30.000	960	0.015	0.04	30.000	680	0.01	0.02	30.000	640	0.01	0.02	30.000	640	0.01	0.02
0.3	5.5	30.000	820	0.015	0.04	28.000	650	0.01	0.02	28.000	610	0.01	0.02	28.000	610	0.01	0.02
0.3	6	30.000	720	0.015	0.04	26.000	600	0.01	0.02	26.000	570	0.01	0.02	25.000	540	0.01	0.02
0.4	2	50.000	2.200	0.06	0.16	50.000	2.000	0.04	0.08	50.000	1.900	0.04	0.08	50.000	1.900	0.04	0.08
0.4	3	50.000	1.740	0.06	0.16	48.000	1.600	0.04	0.08	48.000	1.500	0.04	0.08	48.000	1.500	0.04	0.08
0.4	4	50.000	1.680	0.06	0.16	40.000	1.200	0.04	0.08	40.000	1.100	0.04	0.08	40.000	1.100	0.04	0.08
0.4	5	43.000	1.600	0.045	0.1	34.000	950	0.03	0.05	34.000	900	0.03	0.05	34.000	900	0.03	0.05
0.4	6	32.000	1.260	0.045	0.1	30.000	800	0.03	0.05	30.000	760	0.03	0.05	30.000	760	0.03	0.05
0.4	7	30.000	1.000	0.02	0.08	25.000	600	0.01	0.02	25.000	570	0.01	0.02	25.000	570	0.01	0.02
0.4	8	24.000	720	0.01	0.04	23.000	450	0.005	0.01	23.000	420	0.005	0.01	23.000	420	0.005	0.01
0.5	2.5	50.000	3.270	0.075	0.2	50.000	3.400	0.05	0.1	50.000	3.200	0.05	0.1	50.000	3.200	0.05	0.1
0.5	3	50.000	3.060	0.075	0.2	45.000	3.200	0.05	0.1	45.000	3.000	0.05	0.1	45.000	3.000	0.05	0.1
0.5	4	50.000	3.000	0.075	0.2	40.000	3.000	0.05	0.1	40.000	2.850	0.05	0.1	40.000	2.850	0.05	0.1
0.5	5	47.000	2.870	0.075	0.2	36.000	2.300	0.05	0.1	36.000	2.100	0.05	0.1	36.000	2.100	0.05	0.1

WXL

## Conditions - Schnittwerte - Condizioni - Conditions

High-speed light milling - HSC Schlichtfräsen -  
Fresatura alta velocità - Fraisage UGV

WXL-LN-EBD



Work material Werkstoff Materiale Matière à usiner		Cu				~35 HRC FC250 · SS400 · S55C · NAK55 ~35 HRC				35~45 HRC SKT · SKD61 · NAK80 · HPM1 · DH 33~41 HRC				45~50 HRC SKT · SKD61 · NAK80 · HPM1 · DH 42~50 HRC			
Ø	Lg (mm)	S <sub>c</sub> (min <sup>-1</sup> )	F <sub>c</sub> (mm/min)	a <sub>a</sub> (mm)	pf (mm)	S <sub>c</sub> (min <sup>-1</sup> )	F <sub>c</sub> (mm/min)	a <sub>a</sub> (mm)	pf (mm)	S <sub>c</sub> (min <sup>-1</sup> )	F <sub>c</sub> (mm/min)	a <sub>a</sub> (mm)	pf (mm)	S <sub>c</sub> (min <sup>-1</sup> )	F <sub>c</sub> (mm/min)	a <sub>a</sub> (mm)	pf (mm)
0.5	6	43.000	2.600	0.075	0.2	30.000	2.000	0.05	0.1	30.000	1.900	0.05	0.1	30.000	1.900	0.05	0.1
0.5	7	30.000	2.350	0.075	0.15	27.000	1.700	0.05	0.1	27.000	1.600	0.05	0.1	27.000	1.600	0.05	0.1
0.5	8	27.000	2.000	0.075	0.15	26.000	1.600	0.05	0.1	26.000	1.500	0.05	0.1	26.000	1.500	0.05	0.1
0.5	9	26.000	1.540	0.045	0.075	24.000	1.200	0.03	0.05	24.000	1.100	0.03	0.05	24.000	1.100	0.03	0.05
0.5	10	24.000	1.400	0.015	0.04	22.000	1.100	0.01	0.02	22.000	1.000	0.01	0.02	21.000	950	0.01	0.02
0.6	4	40.000	3.000	0.12	0.21	40.000	3.000	0.06	0.12	40.000	2.850	0.06	0.12	40.000	2.850	0.06	0.12
0.6	6	35.000	2.600	0.09	0.21	32.000	2.100	0.06	0.12	32.000	2.000	0.06	0.12	32.000	2.000	0.06	0.12
0.6	8	30.000	2.000	0.09	0.21	25.000	1.700	0.06	0.12	25.000	1.600	0.06	0.12	25.000	1.600	0.06	0.12
0.6	10	21.000	1.400	0.075	0.12	20.000	1.200	0.05	0.1	20.000	1.100	0.05	0.1	18.000	990	0.05	0.1
0.6	12	20.000	1.000	0.045	0.1	19.000	900	0.03	0.05	19.000	850	0.03	0.05	16.000	800	0.03	0.05
0.7	8	30.000	2.100	0.14	0.245	25.000	1.700	0.07	0.14	25.000	1.600	0.07	0.14	25.000	1.600	0.07	0.14
0.7	12	22.000	1.210	0.06	0.14	19.000	1.000	0.03	0.07	19.000	950	0.03	0.07	19.000	950	0.03	0.07
0.75	3	50.000	5.330	0.15	0.3	50.000	4.800	0.075	0.15	50.000	4.800	0.075	0.15	50.000	4.800	0.075	0.15
0.75	4	42.000	4.110	0.15	0.3	40.000	3.900	0.075	0.15	40.000	3.700	0.075	0.15	40.000	3.700	0.075	0.15
0.75	6	32.000	3.000	0.15	0.3	30.000	2.900	0.075	0.15	30.000	2.700	0.075	0.15	30.000	2.700	0.075	0.15
0.75	8	30.000	2.650	0.15	0.3	24.000	2.300	0.075	0.15	24.000	2.100	0.075	0.15	24.000	2.100	0.075	0.15
0.75	10	30.000	2.400	0.15	0.3	24.000	2.000	0.075	0.15	24.000	1.900	0.075	0.15	24.000	1.900	0.075	0.15
0.75	12	24.000	1.400	0.15	0.2	21.000	1.400	0.075	0.1	21.000	1.300	0.075	0.1	21.000	1.300	0.075	0.1
0.75	14	22.000	1.400	0.1	0.2	18.000	1.200	0.05	0.1	18.000	1.100	0.05	0.1	17.000	1.100	0.05	0.1
0.8	4	40.000	4.500	0.16	0.32	38.000	4.000	0.08	0.16	38.000	3.800	0.08	0.16	38.000	3.600	0.08	0.16
0.8	8	26.000	3.000	0.16	0.32	24.000	3.000	0.08	0.16	24.000	2.800	0.08	0.16	23.000	2.600	0.08	0.16
0.8	12	24.000	2.400	0.12	0.2	21.000	1.800	0.05	0.1	21.000	1.700	0.05	0.1	20.000	1.600	0.05	0.1
0.8	16	18.000	1.600	0.1	0.2	16.000	800	0.05	0.1	16.000	760	0.05	0.1	15.000	700	0.05	0.1
0.9	8	25.000	3.200	0.18	0.54	24.000	3.000	0.09	0.27	24.000	2.800	0.09	0.27	23.000	2.600	0.09	0.27
0.9	12	22.000	2.500	0.18	0.36	18.000	1.800	0.09	0.18	15.800	1.500	0.09	0.18	14.700	1.350	0.09	0.18
0.9	16	16.000	1.200	0.1	0.24	16.000	980	0.05	0.12	14.000	850	0.05	0.12	13.000	780	0.05	0.12
1	3	50.000	5.800	0.2	0.4	50.000	5.600	0.1	0.2	50.000	5.600	0.1	0.2	47.000	5.300	0.1	0.2
1	4	50.000	5.800	0.2	0.4	50.000	5.600	0.1	0.2	50.000	5.600	0.1	0.2	47.000	5.300	0.1	0.2
1	6	38.000	4.000	0.2	0.4	36.000	3.000	0.1	0.2	36.000	2.800	0.1	0.2	34.000	2.600	0.1	0.2
1	8	27.000	3.360	0.2	0.4	25.000	2.600	0.1	0.2	25.000	2.400	0.1	0.2	23.000	2.200	0.1	0.2
1	10	22.000	3.050	0.2	0.4	20.000	2.400	0.1	0.2	20.000	2.200	0.1	0.2	19.000	2.000	0.1	0.2
1	12	16.000	2.580	0.2	0.4	16.000	2.000	0.1	0.2	16.000	1.900	0.1	0.2	15.000	1.700	0.1	0.2
1	14	15.000	2.400	0.2	0.3	15.000	1.800	0.1	0.2	15.000	1.700	0.1	0.2	14.000	1.500	0.1	0.2
1	16	14.000	2.200	0.2	0.2	14.000	1.700	0.1	0.1	14.000	1.600	0.1	0.1	13.000	1.400	0.1	0.1
1	18	13.000	2.000	0.2	0.2	13.000	1.600	0.1	0.1	13.000	1.500	0.1	0.1	12.000	1.300	0.1	0.1
1	20	12.000	1.200	0.1	0.2	12.000	1.200	0.05	0.1	11.000	1.100	0.05	0.1	10.000	1.000	0.05	0.1
1.25	6	32.000	5.550	0.25	0.4	28.000	4.600	0.1	0.2	28.000	4.300	0.1	0.2	25.000	3.700	0.1	0.2
1.25	10	21.000	4.000	0.25	0.4	20.000	3.300	0.1	0.2	20.000	3.100	0.1	0.2	18.000	2.700	0.1	0.2
1.25	15	17.000	3.000	0.25	0.4	17.000	2.800	0.1	0.2	17.000	2.600	0.1	0.2	16.000	2.400	0.1	0.2
1.25	20	15.000	1.800	0.25	0.4	15.000	1.800	0.1	0.2	15.000	1.700	0.1	0.2	14.000	1.500	0.1	0.2
1.25	25	12.000	1.010	0.06	0.1	12.000	1.000	0.03	0.05	12.000	950	0.03	0.05	10.000	860	0.03	0.05
1.25	30	10.000	800	0.06	0.1												
1.5	6	42.000	6.800	0.3	0.6	41.500	6.200	0.15	0.3	41.500	6.200	0.15	0.3	32.000	4.800	0.15	0.3
1.5	8	32.000	4.600	0.3	0.6	30.000	4.500	0.15	0.3	30.000	4.200	0.15	0.3	25.000	3.500	0.15	0.3
1.5	10	28.000	4.000	0.3	0.6	25.000	3.800	0.15	0.3	25.000	3.600	0.15	0.3	20.000	2.800	0.15	0.3
1.5	12	24.000	3.100	0.3	0.6	20.000	3.000	0.15	0.3	20.000	2.800	0.15	0.3	18.000	2.500	0.15	0.3
1.5	14	22.000	2.900	0.3	0.6	18.000	2.700	0.15	0.3	18.000	2.500	0.15	0.3	15.000	2.000	0.15	0.3
1.5	15	20.000	2.800	0.25	0.6	16.000	2.400	0.1	0.3	16.000	2.200	0.1	0.3	13.000	1.700	0.1	0.3
1.5	16	20.000	2.600	0.25	0.4	16.000	2.000	0.1	0.2	16.000	1.900	0.1	0.2	13.000	1.500	0.1	0.2
1.5	20	16.000	2.200	0.25	0.4	14.000	1.800	0.1	0.2	14.000	1.700	0.1	0.2	11.000	1.300	0.1	0.2
1.5	25	16.000	1.800	0.125	0.2	12.000	1.200	0.05	0.1	12.000	1.100	0.05	0.1	9.000	820	0.05	0.1
1.5	30	12.000	1.000	0.075	0.1	10.000	800	0.03	0.05	10.000	760	0.03	0.05	7.800	590	0.03	0.05
1.75	10	26.000	5.400	0.375	0.6	25.000	3.750	0.15	0.3	25.000	3.500	0.15	0.3	19.500	2.660	0.15	0.3
1.75	15	20.000	4.000	0.3	0.6	18.000	3.000	0.1	0.3	18.000	2.800	0.1	0.3	14.000	2.180	0.1	0.3
1.75	20	18.000	3.000	0.3	0.4	16.000	2.700	0.1	0.2	16.000	2.500	0.1	0.2	12.000	1.850	0.1	0.2
1.75	25	14.000	2.800	0.2	0.2	12.000	2.000	0.1	0.1	12.000	1.900	0.1	0.1	9.000	1.400	0.1	0.1
1.75	30	10.000	2.200	0.125	0.2	10.000	1.600	0.05	0.1	10.000	1.500	0.05	0.1	8.000	1.200	0.05	0.1
1.75	35	10.000	1.200	0.1	0.1	10.000	1.000	0.05	0.05	10.000	950	0.05	0.05	7.000	670	0.05	0.05

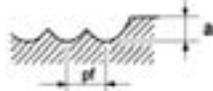
WXL

## Conditions - Schnittwerte - Condizioni - Conditions

WXL-LN-EBD

High-speed light milling - HSC Schlichtfräsen -  
Fresatura alta velocità - Fraisage UGV

Work material Werkstoff Materiale Matière à usiner		Cu					~35 HRC FC250 · SS400 · S55C · NAK55 ~35 HRC				35~45 HRC SKT · SKD61 · NAK80 · HPM1 · DH 33~41 HRC				45~50 HRC SKT · SKD61 · NAK80 · HPM1 · DH 42~50 HRC			
Ø	Lg (mm)	S. (min <sup>-1</sup> )	F. (mm/min)	aa (mm)	pf (mm)	S. (min <sup>-1</sup> )	F. (mm/min)	aa (mm)	pf (mm)	S. (min <sup>-1</sup> )	F. (mm/min)	aa (mm)	pf (mm)	S. (min <sup>-1</sup> )	F. (mm/min)	aa (mm)	pf (mm)	
2	8	31.000	5.700	0.4	1	31.000	5.700	0.2	0.5	31.000	5.700	0.2	0.5	24.000	4.400	0.2	0.5	
2	10	25.000	4.500	0.4	1	25.000	4.500	0.2	0.5	25.000	4.200	0.2	0.5	20.000	3.300	0.2	0.5	
2	12	20.000	4.000	0.4	1	20.000	3.600	0.2	0.5	20.000	3.400	0.2	0.5	16.000	2.700	0.2	0.5	
2	14	20.000	4.000	0.4	1	20.000	3.600	0.2	0.5	20.000	3.400	0.2	0.5	16.000	2.700	0.2	0.5	
2	15	20.000	4.000	0.4	1	20.000	3.600	0.2	0.5	20.000	3.400	0.2	0.5	16.000	2.700	0.2	0.5	
2	16	20.000	3.460	0.4	0.6	18.000	3.200	0.2	0.5	18.000	3.000	0.2	0.5	14.000	2.300	0.2	0.5	
2	20	18.000	3.000	0.4	0.5	16.000	2.800	0.2	0.4	16.000	2.600	0.2	0.4	12.000	1.900	0.2	0.4	
2	25	18.000	3.000	0.25	0.6	16.000	2.800	0.1	0.3	16.000	2.600	0.1	0.3	12.000	1.900	0.1	0.3	
2	30	16.000	2.850	0.25	0.4	14.000	2.400	0.1	0.2	14.000	2.200	0.1	0.2	11.000	1.700	0.1	0.2	
2	35	14.000	2.200	0.25	0.4	12.000	1.800	0.1	0.2	12.000	1.700	0.1	0.2	9.000	1.700	0.1	0.2	
2	40	12.000	1.600	0.125	0.2	10.000	1.300	0.05	0.1	10.000	1.200	0.05	0.1	7.000	840	0.05	0.1	
2.5	10	25.000	5.600	0.5	1.25	25.000	5.400	0.25	0.5	25.000	5.400	0.25	0.5	19.000	4.000	0.25	0.5	
2.5	15	20.000	4.400	0.5	1.25	20.000	4.200	0.25	0.5	20.000	3.900	0.25	0.5	16.000	3.100	0.25	0.5	
2.5	20	18.000	3.800	0.5	1.25	16.000	3.500	0.25	0.5	16.000	3.300	0.25	0.5	12.000	2.400	0.25	0.5	
2.5	25	20.000	3.400	0.4	0.75	15.000	3.200	0.2	0.3	15.000	3.000	0.2	0.3	12.000	2.400	0.2	0.3	
2.5	30	16.000	2.900	0.25	0.75	14.000	2.500	0.1	0.3	14.000	2.300	0.1	0.3	11.000	1.800	0.1	0.3	
2.5	35	14.000	2.200	0.25	0.75	12.000	1.600	0.1	0.3	12.000	1.500	0.1	0.3	9.000	1.100	0.1	0.3	
2.5	40	12.000	1.800	0.25	0.5	10.000	1.200	0.1	0.2	10.000	1.100	0.1	0.2	8.000	880	0.1	0.2	
2.5	45	9.000	1.200	0.2	0.25	9.000	900	0.1	0.1	9.000	850	0.1	0.1	7.000	660	0.1	0.1	
2.5	50	8.000	1.100	0.2	0.25	8.000	800	0.1	0.1	8.000	760	0.1	0.1	6.000	570	0.1	0.1	
3	10	22.000	5.900	0.75	1.25	20.000	5.400	0.3	0.5	20.000	5.000	0.3	0.5	15.000	3.750	0.3	0.5	
3	20	18.000	4.400	0.75	1.25	16.000	4.200	0.3	0.5	16.000	3.900	0.3	0.5	12.000	2.900	0.3	0.5	
3	25	14.000	4.000	0.6	1.25	12.000	3.200	0.3	0.5	12.000	3.000	0.3	0.5	9.000	2.250	0.3	0.5	
3	30	10.000	3.200	0.6	1.25	10.000	2.600	0.3	0.5	10.000	2.400	0.3	0.5	8.000	1.900	0.3	0.5	
3	35	9.000	3.000	0.4	1	9.000	2.300	0.2	0.4	9.000	2.100	0.2	0.4	7.000	1.600	0.2	0.4	
3	40	9.000	2.800	0.4	0.75	9.000	2.000	0.2	0.3	9.000	1.900	0.2	0.3	7.000	1.400	0.2	0.3	
3	45	8.000	2.500	0.4	0.75	8.000	1.800	0.2	0.3	8.000	1.700	0.2	0.3	6.500	1.300	0.2	0.3	
3	50	7.000	2.300	0.4	0.75	7.000	1.600	0.2	0.3	7.000	1.500	0.2	0.3	5.500	1.100	0.2	0.3	

Max. cutting depth  
Maximale Schnitttiefe  
Profondità di taglio  
Profondeur de coupe

1. Use a rigid and precise machine and holder.
  2. When machining carbon steels or hardened steels, using MQL (Minimum Quantity Lubrication / mist coolant) is recommended.
  3. Please adjust conditions based on machining accuracy, machining shape and machining path.
  4. When using a tool with a diameter of  $\varnothing > 0.5$  (R0.25) or less, or an L/D (effective length/tool diameter) ratio greater than 10, high loads can cause tool breakage. Therefore, adjust the cutting conditions based on the machining situation.
  5. When the available RPM are insufficient, please reduce the RPM and feed rates in proportion.
1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spannmittel.
  2. Wir empfehlen Luft-oder Minimalmengen Kühlung für bearbeitung wie Kohlenstoffstahl und Gehärteter Stahl.
  3. Bitte regulieren Sie Schnittgeschwindigkeit, Vorschub und Spanntiefe entsprechend Ihrer aktuellen Zerspannungsbedingungen.
  4. Schnittwerte sind für Werkzeugen mit  $\varnothing > 0.5$  (R0.25), und L/D ratio. (Länge/dia) < 10. Bei andere Auskraglängen müssen Schnittgeschwindigkeit, Vorschub und Spanntiefe verändert werden.
  5. Bitte regulieren Sie Schnittgeschwindigkeit und Vorschub.

1. Utilizzare una macchina ed un mandrino di elevata rigidità e di alta precisione.
  2. Sugeriamo l'utilizzo di aria compressa o lubrificazione minimale (misto olio).
  3. Regolare la velocità, l'avanzamento e la profondità di taglio secondo le attuali condizioni di taglio.
  4. Queste condizioni di fresatura di freze  $\varnothing > 0.5$  (R0.25), L/D ratio. (lunga/dia) < 10. Per sporgenze ridurre velocità, l'avanzamento e la profondità di taglio.
  5. Regolare la velocità, l'avanzamento e la profondità di taglio.
1. Utiliser une machine et un porte-outil de grande rigidité et de haute précision.
  2. Utiliser de l'arrosage en brouillard (mist).
  3. Ajuster la vitesse, avances et la profondeur de coupe en fonction de la précision de la machine ainsi que le chemin de fraisage.
  4. Les conditions de coupes ci-dessus sont pour l'utilisation d'outil avec un  $\varnothing > 0.5$  (R0.25), et un ratio L/D (longueur/dia) < 10. Ajuster ces conditions de coupes si nécessaire.
  5. Ajuster la vitesse, avances et la profondeur de coupe.

## Conditions - Schnittwerte - Condizioni - Conditions

Multipurpose Side milling - Konturfräsen  
Sgrossatura e contornatura - Contournage

UP-PHS



Work material Werkstoff Materiale Matière à usiner	C≤0,2% - GG		SCM - SKD		30~38 HRC		38~45 HRC - SUS		45~55 HRC - Tiall	
	SS400·S55C · FC250 ~750N/mm <sup>2</sup>		SCM · SKT · SKS · SKD ~30 HRC		SKT · SKD · NAK55·HPMI 30~38 HRC		SUS304 · SKD 38~45 HRC		45~55 HRC	
	100 (m/min)		78 (m/min)		66 (m/min)		62 (m/min)		60 (m/min)	
Ø	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
3	10.600	1.170	8.300	900	7.000	650	6.600	670	6.350	580
4	7.950	1.200	6.200	980	5.250	650	4.950	700	4.750	620
5	6.350	1.260	4.950	1.000	4.200	700	3.950	750	3.800	640
6	5.300	1.500	3.100	1.100	2.650	790	2.450	770	2.400	660
8	4.000	1.500	3.100	1.100	2.650	790	2.450	770	2.400	660
10	3.200	1.320	2.500	1.000	2.100	720	1.950	700	1.900	630
12	2.650	1.320	2.050	1.000	1.750	680	1.650	650	1.600	570
Max. cutting depth Maximale Schnitttiefe Profondità di taglio Profondeur de coupe										

1. Use a rigid and precise machine and holder.
2. Please adjust the speed and feed when the cutting depth is large or when machines with low rigidity are used.
3. Please use a suitable fluid with high smoke retardant properties.
4. During dry (no fluid) milling, please use air blow to remove disposable chips from the milling area and to eliminate chip packing.

1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spannmittel.
2. Vorschub und Geschwindigkeit der Schnitttiefe und Maschinen-Starrheit anpassen.
3. Benutzen Sie Kühlmittel mit rauchhemmenden Zusätzen.
4. Vorschub und Geschwindigkeit der Schnitttiefe und Maschinen-Starrheit anpassen.

1. Usare un mandrino portautensile preciso e rigido/
2. Regolare la velocità e l'avanzamento se si aumenta la profondità di passata e se utilizzata su macchine non rigide.
3. Si consiglia di usare emulsione a scarsa emissione di fumi.
4. Per fresatura a secco utilizzare aria.

1. Utiliser une machine et un attachement précis et rigide.
2. Ajuster la vitesse et l'avance en cas de profondeur de coupe importante ou en utilisant une machine non-rigide.
3. Utiliser un liquide de refroidissement adéquat.
4. En cas d'usinage à sec, utiliser de l'air comprimé pour l'évacuation des copeaux de l'aire d'usinage et pour éviter une agglomération des copeaux.

UP

Multipurpose Side milling - Konturfräsen  
Sgrossatura e contornatura - Contournage

UP-PHS

Work material Werkstoff Materiale Matière à usiner	C≤0,2% - GG		SCM - SKD		30~38 HRC		38~45 HRC - SUS		45~55 HRC - Tiall	
	SS400·S55C · FC250 ~750N/mm <sup>2</sup>		SCM · SKT · SKS · SKD ~30 HRC		SKT · SKD · NAK55·HPMI 30~38 HRC		SUS304 · SKD 38~45 HRC		45~55 HRC	
	72 (m/min)		54 (m/min)		41 (m/min)		47 (m/min)		42 (m/min)	
Ø	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
3	7.600	570	5.700	480	4.400	315	4.950	360	4.450	380
4	5.700	570	4.300	480	3.300	315	3.750	400	3.350	430
5	4.600	650	3.400	500	2.600	330	2.950	430	2.650	460
6	3.800	650	2.900	500	2.200	350	2.500	450	2.250	480
8	2.900	660	2.200	520	1.650	380	1.850	465	1.650	480
10	2.300	610	1.700	480	1.300	330	1.500	430	1.350	450
12	1.900	610	1.400	430	1.100	315	1.200	400	1.100	420
Max. cutting depth Maximale Schnitttiefe Profondità di taglio Profondeur de coupe										

1. Use a rigid and precise machine and holder.
2. Please adjust the speed and feed when the cutting depth is large or when machines with low rigidity are used.
3. Please use a suitable fluid with high smoke retardant properties.
4. During dry (no fluid) milling, please use air blow to remove disposable chips from the milling area and to eliminate chip packing.

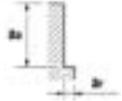
1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spannmittel.
2. Vorschub und Geschwindigkeit der Schnitttiefe und Maschinen-Starrheit anpassen.
3. Benutzen Sie Kühlmittel mit rauchhemmenden Zusätzen.
4. Vorschub und Geschwindigkeit der Schnitttiefe und Maschinen-Starrheit anpassen.

1. Usare un mandrino portautensile preciso e rigido/
2. Regolare la velocità e l'avanzamento se si aumenta la profondità di passata e se utilizzata su macchine non rigide.
3. Si consiglia di usare emulsione a scarsa emissione di fumi.
4. Per fresatura a secco utilizzare aria.

1. Utiliser une machine et un attachement précis et rigide.
2. Ajuster la vitesse et l'avance en cas de profondeur de coupe importante ou en utilisant une machine non-rigide.
3. Utiliser un liquide de refroidissement adéquat.
4. En cas d'usinage à sec, utiliser de l'air comprimé pour l'évacuation des copeaux de l'aire d'usinage et pour éviter une agglomération des copeaux.

## Conditions - Schnittwerte - Condizioni - Conditions

## WXS-EMS

Work material Werkstoff Materiale Matière à usiner	C≤0,2% - GG NAK55 · HPM1 · SKT ~750N/mm <sup>2</sup>		SCM - SKD SKD11·SKD61·NAK80 ~30 HRC		45~55 HRC 45~55 HRC		55~60 HRC 55~60 HRC		60~65 HRC 45~55 HRC		65~70 HRC 65~70 HRC	
	Ø	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )
1	20.000	800	20.000	800	20.000	800	20.000	560	20.000	480	16.000	335
2	20.000	1.600	20.000	1.600	16.000	1.250	12.000	670	11.000	535	7.950	335
3	15.000	1.800	13.500	1.600	10.500	1.250	7.950	670	7.450	535	5.300	335
4	11.000	1.800	9.950	1.600	7.950	1.250	5.950	670	5.550	535	4.000	335
5	8.900	1.800	7.950	1.600	6.350	1.250	4.800	670	4.450	535	3.200	335
6	7.450	2.650	6.650	2.400	5.300	1.900	4.000	1.000	3.700	800	2.650	505
8	5.550	2.650	4.950	2.400	4.000	1.900	3.000	1.000	2.800	800	2.000	505
10	4.450	2.650	4.000	2.400	3.200	1.900	2.400	1.000	2.250	800	1.600	505
12	3.700	2.650	3.300	2.400	2.650	1.900	2.000	1.000	1.850	800	1.350	505
14	3.100	2.500	2.800	2.250	2.250	1.800	1.700	1.000	1.550	800	1.100	505
15	2.850	2.400	2.600	2.200	2.100	1.750	1.550	950	1.450	800	1.050	505
16	2.700	2.400	2.400	2.100	1.950	1.700	1.450	930	1.350	800	995	505
18	2.400	2.250	2.200	2.000	1.750	1.600	1.300	895	1.200	800	885	505
20	2.200	2.150	1.950	1.900	1.550	1.500	1.150	845	1.100	695	800	505
25	1.700	2.450	1.550	2.100	1.250	1.500	955	915	890	750	635	505
30	1.400	2.300	1.300	1.750	1.050	1.250	795	760	740	620	620	430
Max. cutting depth Maximale Schnitttiefe Profondità di taglio Profondeur de coupe												

1. Use a rigid and precise machine and holder.
2. When chattering occurs, reduce the speed and feed simultaneously.
3. Use a suitable cutting fluid with high smoke retardant properties.

1. Utilizzare una macchina ed un mandrino di elevata rigidità e di alta precisione.
2. In caso di vibrazione, ridurre simultaneamente la velocità di taglio e l'avanzamento.
3. Utilizzare dei lubrificanti di taglio adeguati, dotati di un elevato coefficiente di rallentamento di emissione del fumo.

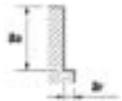
1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spanmittel.
2. Falls Vibrationen auftreten sollten, Vorschub und Schnittgeschwindigkeit reduzieren.
3. Benutzen Sie Kühlmittel mit rauchhemmenden Zusätzen.

1. Utiliser une machine et un porte-outil de grande rigidité et de haute précision.
2. En cas de vibrations, réduisez, simultanément, la vitesse de coupe et l'avance.
3. Utiliser des fluides de coupes de haute qualité avec un coef. élevé de ralentissement d'émission de fumée.

WXS

## WXS-EMS

High speed side milling - HSC Konturfräsen  
Fresatura alta velocità contornatura - Fraisage UGV contournage

Work material Werkstoff Materiale Matière à usiner	C≤0,2% - GG NAK55 · HPM1 · SKT ~750N/mm <sup>2</sup>		SCM - SKD SKD11·SKD61·NAK80 ~30 HRC		45~55 HRC 45~55 HRC		55~60 HRC 55~60 HRC		60~65 HRC 45~55 HRC		65~70 HRC 65~70 HRC	
	Ø	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )
1	50.00	1.600	50.000	2.000	50.000	2.000	50.000	1.600	47.500	1.350	32.000	715
2	47.500	3.250	47.500	3.800	40.000	3.200	25.500	1.650	24.000	1.350	16.000	800
3	32.000	3.450	32.000	3.800	26.500	3.200	17.000	1.650	16.000	1.350	10.500	800
4	24.000	3.900	24.000	3.800	20.000	3.200	12.500	1.650	12.000	1.350	7.950	800
5	19.000	4.100	19.000	3.800	16.000	3.200	10.000	1.650	9.550	1.350	6.350	800
6	16.000	5.750	12.000	5.750	9.950	4.800	6.350	2.450	5.950	2.000	4.000	1.200
8	12.000	5.750	12.000	5.750	9.950	4.800	6.350	2.450	5.950	2.000	4.000	1.200
10	9.550	5.750	9.550	5.750	7.950	4.800	5.100	2.450	4.800	2.000	3.200	1.200
12	7.950	5.750	7.950	5.750	6.650	4.800	4.250	2.450	4.000	2.000	2.650	1.200
14	6.800	5.400	6.800	5.400	5.650	4.500	3.600	2.400	3.400	2.000	2.250	1.200
15	6.350	5.300	6.350	5.300	5.250	4.350	3.350	2.300	3.150	1.950	2.100	1.200
16	5.950	5.150	5.950	5.150	4.950	4.250	3.150	2.250	2.950	1.850	1.950	1.200
18	5.300	4.850	5.300	4.850	4.400	4.050	2.800	2.200	2.650	1.750	1.750	1.200
20	4.750	4.600	4.750	4.600	3.950	3.650	2.500	2.050	2.350	1.550	1.550	1.100
25	3.800	5.350	3.800	5.050	3.150	3.800	2.000	2.000	1.900	1.250	1.250	1.050
30	3.150	4.950	3.150	4.250	2.650	3.150	1.650	1.800	1.550	1.050	1.050	1.000
Max. cutting depth Maximale Schnitttiefe Profondità di taglio Profondeur de coupe												

1. Use a rigid and precise machine and holder.
2. When chattering occurs, reduce the speed and feed simultaneously.
3. Use a suitable cutting fluid with high smoke retardant properties.

1. Utilizzare una macchina ed un mandrino di elevata rigidità e di alta precisione.
2. In caso di vibrazione, ridurre simultaneamente la velocità di taglio e l'avanzamento.
3. Utilizzare dei lubrificanti di taglio adeguati, dotati di un elevato coefficiente di rallentamento di emissione del fumo.

1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spanmittel.
2. Falls Vibrationen auftreten sollten, Vorschub und Schnittgeschwindigkeit reduzieren.
3. Benutzen Sie Kühlmittel mit rauchhemmenden Zusätzen.

1. Utiliser une machine et un porte-outil de grande rigidité et de haute précision.
2. Utiliser de l'arrosage en brouillard (mist).
3. Utiliser des fluides de coupes de haute qualité avec un coef. élevé de ralentissement d'émission de fumée.

## Conditions - Schnittwerte - Condizioni - Conditions

## WXS-HS-EBD - WXS-EBD



Work material Werkstoff Materiale Matière à usiner	C≤0,2% - GG		SCM - SKD		30~45 HRC		45~55 HRC - HRS		55~60 HRC	
	S55C•SS400•GG25 ~750N/mm <sup>2</sup>		SKD•SKS•SNCM ~30 HRC		NAK55•HPMI•SKT 30~45 HRC		X210Cr12, X40CrMoV51 45~55 HRC		55~60 HRC	
Ø	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
R 0.5 X 1	50.000	3.000	50.000	3.000	50.000	2.500	32.000	1.600	32.000	1.450
R 1 X 2	50.000	6.000	50.000	6.000	44.500	4.450	31.500	3.150	28.500	2.600
R 1.5 X 3	37.000	6.650	33.000	6.000	29.500	4.400	24.000	3.600	19.000	2.600
R 2 X 4	27.500	6.600	25.000	6.000	22.000	4.400	18.000	3.600	14.000	2.200
R 2.5 X 5	22.000	6.150	20.000	5.600	17.500	4.000	14.500	3.300	11.000	1.950
R 3 X 6	18.500	5.900	16.500	5.250	14.500	3.450	12.000	2.850	9.500	1.900
R 4 X 8	13.500	4.300	12.500	4.000	11.000	2.600	9.150	2.150	7.150	1.400
R 5 X 10	11.000	3.500	10.000	3.200	8.900	2.100	7.300	1.750	5.700	1.100
R 6 X 12	9.250	2.950	8.350	2.650	7.400	1.750	6.100	1.450	4.750	950

Max. cutting depth Maximale Schnitttiefe Profondità di taglio Profondeur de coupe	$aa = 0,02D$ $pf = 0,05D$		<table border="1"> <tr> <td></td> <td>aa</td> <td>pf</td> </tr> <tr> <td>R ≤ 8</td> <td>0.020</td> <td>0.050</td> </tr> <tr> <td>8 &lt; R</td> <td>0.32 mm</td> <td>0.050</td> </tr> </table>		aa	pf	R ≤ 8	0.020	0.050	8 < R	0.32 mm	0.050
					aa	pf						
R ≤ 8	0.020	0.050										
8 < R	0.32 mm	0.050										

- Speeds and feeds are designed to be used in conjunction with small passes on a high speed & precision machine set-up.
- Do not use inflammable coolant. Using worn tools may generate sparks.
- Use compressed air or a high quality coolant with a low co-efficient of smoke emmision.

- Die Schnittdaten sin ausgelegt für geringe Zustellungen in Verbindung mit HSC tauglichen Maschinen und Spanmittel.
- Bitte geeignetes Kühlmittel mit rauchhemmenden Zusätzen verwenden.
- Benutzen Sie Druckluft oder Kühlmittel mit rauchhemdenden Zusätzen.

- Queste velocità e questi avanzamenti sono indicati per fresatura di piccole passate ad alta velocità e centri di lavorazione di alta precisione.
- Non utilizzare lubrificanti da taglio infiammabili; gli utensili troppo usurati possono produrre scintille.
- Utilizzare un getto di aria compressa. Se la vostra scelta ricade su dei liquidi da taglio, sceglierli di alta qualità, dotati di un coefficiente elevato di rallentamento d'emissione del fumo.

- Les vitesses et avances sont indiquées pour le fraisage de petites passes à haute vitesse / centres d'usinage de haute précision.
- Ne pas utiliser de lubrifiants de coupe inflammables, les outils fortement usés peuvent produire des étincelles.
- Utilisez un jet d'air comprimé ou des fluides de coupe de haute qualité avec un coef. élevé de ralentissement d'émission de fumée.

WXS

Conditions - Schnittwerte - Condizioni - Conditions

WXS-LN-EBD - WX-LN-EBD - FX-LN-EBD-6

High speed milling - HSC Schlichtfräsen -  
Fresatura alta velocità - Fraisage UGV



Work material Werkstoff Materiale Matière à usiner		C≤0.2% - GG E24•XC48•FT25 75 MPA					SCM - SKD 35NCD16•40CMD8 30 HRC					30~38 HRC 35NCD16 30~38 HRC				
		120 (m/min)					110 (m/min)					100 (m/min)				
Ø	Lg (mm)	S. (min <sup>-1</sup> )	F. (mm/min)	AZ (mm)	aa (mm)	pf (mm)	S. (min <sup>-1</sup> )	F. (mm/min)	AZ (mm)	aa (mm)	pf (mm)	S. (min <sup>-1</sup> )	F. (mm/min)	AZ (mm)	aa (mm)	pf (mm)
0.2	0.5	50.000	400	0.004	0.020	0.060	50.000	360	0.004	0.018	0.054	50.000	320	0.003	0.016	0.048
0.2	1	50.000	400	0.004	0.010	0.024	50.000	360	0.004	0.009	0.022	50.000	320	0.003	0.008	0.019
0.2	1.5	50.000	400	0.004	0.008	0.010	50.000	360	0.004	0.007	0.009	50.000	320	0.003	0.006	0.008
0.3	1	50.000	600	0.006	0.020	0.063	50.000	540	0.005	0.018	0.057	50.000	480	0.005	0.016	0.050
0.3	1.5	50.000	600	0.006	0.015	0.040	50.000	540	0.005	0.014	0.036	50.000	480	0.005	0.012	0.032
0.3	2	50.000	600	0.006	0.012	0.036	50.000	540	0.005	0.011	0.032	50.000	480	0.005	0.010	0.029
0.4	1	50.000	900	0.009	0.040	0.120	50.000	810	0.008	0.036	0.108	50.000	720	0.007	0.032	0.096
0.4	1.5	50.000	900	0.009	0.020	0.100	50.000	810	0.008	0.018	0.090	50.000	720	0.007	0.016	0.080
0.4	2	50.000	900	0.009	0.020	0.060	50.000	810	0.008	0.018	0.054	50.000	720	0.007	0.016	0.048
0.4	2.5	50.000	800	0.008	0.020	0.050	50.000	720	0.007	0.018	0.045	50.000	640	0.006	0.016	0.040
0.4	3	50.000	800	0.008	0.020	0.048	50.000	720	0.007	0.018	0.043	50.000	640	0.006	0.016	0.038
0.5	2	50.000	1.500	0.015	0.020	0.070	50.000	1.350	0.014	0.018	0.063	40.000	960	0.012	0.016	0.056
0.5	3	50.000	1.200	0.012	0.020	0.065	50.000	1.080	0.011	0.018	0.059	40.000	768	0.010	0.016	0.052
0.5	4	50.000	1.100	0.011	0.020	0.060	50.000	990	0.010	0.018	0.054	40.000	704	0.009	0.016	0.048
0.5	5	50.000	1.100	0.011	0.020	0.050	40.000	792	0.010	0.018	0.045	40.000	704	0.009	0.016	0.040
0.5	6	50.000	1.100	0.011	0.013	0.039	40.000	792	0.010	0.012	0.035	40.000	704	0.009	0.010	0.031
0.5	8	50.000	900	0.009	0.010	0.030	40.000	648	0.008	0.009	0.027	40.000	576	0.007	0.008	0.024
0.6	2	40.000	1.280	0.016	0.030	0.100	40.000	1.152	0.014	0.027	0.090	40.000	1.024	0.013	0.024	0.080
0.6	3	40.000	1.200	0.015	0.030	0.100	40.000	1.080	0.014	0.027	0.090	40.000	960	0.012	0.024	0.080
0.6	4	40.000	1.040	0.013	0.030	0.100	40.000	936	0.012	0.027	0.090	40.000	832	0.010	0.024	0.080
0.6	5	40.000	960	0.012	0.030	0.100	40.000	864	0.011	0.027	0.090	40.000	768	0.010	0.024	0.080
0.6	6	40.000	880	0.011	0.030	0.100	40.000	792	0.010	0.027	0.090	40.000	704	0.009	0.024	0.080
0.6	8	40.000	880	0.011	0.017	0.100	40.000	792	0.010	0.015	0.090	40.000	704	0.009	0.014	0.080
0.8	2	40.000	1.440	0.018	0.050	0.150	40.000	1.296	0.016	0.045	0.135	40.000	1.152	0.014	0.040	0.120
0.8	4	40.000	1.440	0.018	0.040	0.100	40.000	1.296	0.016	0.036	0.090	40.000	1.152	0.014	0.032	0.080
0.8	5	40.000	1.440	0.018	0.040	0.100	40.000	1.296	0.016	0.036	0.090	40.000	1.152	0.014	0.032	0.080
0.8	6	40.000	1.440	0.018	0.035	0.100	40.000	1.296	0.016	0.032	0.090	40.000	1.152	0.014	0.028	0.080
0.8	7	40.000	1.360	0.017	0.030	0.090	40.000	1.224	0.015	0.027	0.080	40.000	1.088	0.014	0.024	0.070
0.8	8	40.000	1.200	0.015	0.030	0.070	40.000	1.080	0.014	0.027	0.063	40.000	960	0.012	0.024	0.056
0.8	10	40.000	1.200	0.015	0.020	0.060	40.000	1.080	0.014	0.018	0.054	40.000	960	0.012	0.016	0.048
1	3	40.000	2.000	0.025	0.100	0.200	40.000	1.800	0.023	0.090	0.180	40.000	1.600	0.020	0.080	0.160
1	4	40.000	1.760	0.022	0.070	0.200	40.000	1.584	0.020	0.063	0.180	40.000	1.408	0.018	0.056	0.160
1	5	40.000	1.760	0.022	0.050	0.200	40.000	1.584	0.020	0.045	0.180	40.000	1.408	0.018	0.040	0.160
1	6	40.000	1.760	0.022	0.050	0.200	40.000	1.584	0.020	0.045	0.180	40.000	1.408	0.018	0.040	0.160
1	7	40.000	1.600	0.020	0.050	0.150	40.000	1.440	0.018	0.045	0.135	40.000	1.280	0.016	0.040	0.120
1	8	40.000	1.600	0.020	0.040	0.150	40.000	1.440	0.018	0.036	0.135	40.000	1.280	0.016	0.032	0.120
1	9	40.000	1.600	0.020	0.040	0.150	40.000	1.440	0.018	0.036	0.135	40.000	1.280	0.016	0.032	0.120
1	10	40.000	1.600	0.020	0.030	0.100	40.000	1.440	0.018	0.027	0.090	40.000	1.280	0.016	0.024	0.080
1	12	40.000	1.200	0.015	0.030	0.100	40.000	1.080	0.014	0.027	0.090	40.000	960	0.012	0.024	0.080
1	14	40.000	1.200	0.015	0.030	0.100	40.000	1.080	0.014	0.027	0.090	40.000	960	0.012	0.024	0.080
1	16	40.000	1.200	0.015	0.025	0.100	40.000	1.080	0.014	0.023	0.090	40.000	960	0.012	0.020	0.080
1	20	40.000	1.200	0.015	0.020	0.080	40.000	1.080	0.014	0.018	0.072	40.000	960	0.012	0.016	0.064
1.2	6	31.847	1.911	0.030	0.050	0.120	29.193	1.576	0.027	0.045	0.108	26.539	1.274	0.024	0.040	0.096
1.2	8	31.847	1.656	0.026	0.040	0.120	29.193	1.366	0.023	0.036	0.108	26.539	1.104	0.021	0.032	0.096
1.2	10	31.847	1.401	0.022	0.030	0.090	29.193	1.156	0.020	0.027	0.081	26.539	934	0.018	0.024	0.072
1.2	12	31.847	1.274	0.020	0.020	0.090	29.193	1.051	0.018	0.018	0.081	26.539	849	0.016	0.016	0.072
1.4	8	27.298	1.638	0.030	0.060	0.200	25.023	1.351	0.027	0.054	0.180	22.748	1.092	0.024	0.048	0.160
1.4	12	27.298	1.638	0.030	0.050	0.180	25.023	1.351	0.027	0.045	0.162	22.748	1.092	0.024	0.040	0.144
1.4	16	27.298	1.638	0.030	0.040	0.140	25.023	1.351	0.027	0.036	0.126	22.748	1.092	0.024	0.032	0.112
1.5	8	25.478	1.682	0.033	0.070	0.180	23.355	1.387	0.030	0.063	0.162	21.231	1.121	0.026	0.056	0.144
1.5	12	25.478	1.682	0.033	0.070	0.180	23.355	1.387	0.030	0.063	0.162	21.231	1.121	0.026	0.056	0.144
1.5	16	25.478	1.427	0.028	0.050	0.140	23.355	1.177	0.025	0.045	0.126	21.231	951	0.022	0.040	0.112
1.5	20	25.478	1.274	0.025	0.040	0.120	23.355	1.051	0.023	0.036	0.108	21.231	849	0.020	0.032	0.096
1.6	8	23.885	1.672	0.035	0.070	0.200	21.895	1.379	0.032	0.063	0.180	19.904	1.115	0.028	0.056	0.160
1.6	12	23.885	1.529	0.032	0.070	0.200	21.895	1.261	0.029	0.063	0.180	19.904	1.019	0.026	0.056	0.160
1.6	16	23.885	1.433	0.030	0.050	0.150	21.895	1.182	0.027	0.045	0.135	19.904	955	0.024	0.040	0.120
1.6	20	23.885	1.194	0.025	0.040	0.120	21.895	985	0.023	0.036	0.108	19.904	796	0.020	0.032	0.096
1.8	8	21.231	1.741	0.041	0.080	0.250	19.462	1.436	0.037	0.072	0.225	17.693	1.161	0.033	0.064	0.200
1.8	12	21.231	1.486	0.035	0.080	0.200	19.462	1.226	0.032	0.072	0.180	17.693	991	0.028	0.064	0.160
1.8	16	21.231	1.274	0.030	0.060	0.150	19.462	1.051	0.027	0.054	0.135	17.693	849	0.024	0.048	0.120
1.8	20	21.231	1.146	0.027	0.050	0.135	19.462	946	0.024	0.045	0.122	17.693	764	0.022	0.040	0.108
1.6	8	23.885	1.672	0.035	0.070	0.200	21.895	1.379	0.032	0.063	0.180	19.904	1.115	0.028	0.056	0.160
1.6	12	23.885	1.529	0.032	0.070	0.200	21.895	1.261	0.029	0.063	0.180	19.904	1.019	0.026	0.056	0.160
1.6	16	23.885	1.433	0.030	0.050	0.150	21.895	1.182	0.027	0.045	0.135	19.904	955	0.024	0.040	0.120
1.6	20	23.885	1.194	0.025	0.040	0.120	21.895	985	0.023	0.036	0.108	19.904	796	0.020	0.032	0.096

WXS

OSG Europe : www.osgeurope.com

## Conditions - Schnittwerte - Condizioni - Conditions

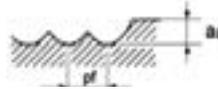
High speed milling - HSC Schlichtfräsen -  
Fresatura alta velocità - Fraisage UGV

WXS-LN-EBD - WX-LN-EBD - FX-LN-EBD-6



Work material Werkstoff Materiale Matière à usiner		C≤0,2% - GG E24·XC48·FT25 75 MPA					SCM - SKD 35NCD16·40CMD8 30 HRC					30~38 HRC 35NCD16 30~38 HRC				
		120 (m/min)					110 (m/min)					100 (m/min)				
Ø	Lg (mm)	S. (min <sup>-1</sup> )	F. (mm/min)	AZ (mm)	aa (mm)	pf (mm)	S. (min <sup>-1</sup> )	F. (mm/min)	AZ (mm)	aa (mm)	pf (mm)	S. (min <sup>-1</sup> )	F. (mm/min)	AZ (mm)	aa (mm)	pf (mm)
1.8	8	21.231	1.741	0.041	0.080	0.250	19.462	1.436	0.037	0.072	0.225	17.693	1.161	0.033	0.064	0.200
1.8	12	21.231	1.486	0.035	0.080	0.200	19.462	1.226	0.032	0.072	0.180	17.693	991	0.028	0.064	0.160
1.8	16	21.231	1.274	0.030	0.060	0.150	19.462	1.051	0.027	0.054	0.135	17.693	849	0.024	0.048	0.120
1.8	20	21.231	1.146	0.027	0.050	0.135	19.462	946	0.024	0.045	0.122	17.693	764	0.022	0.040	0.108
2	4	19.108	1.911	0.050	0.180	0.500	17.516	1.576	0.045	0.162	0.450	15.924	1.274	0.040	0.144	0.400
2	6	19.108	1.720	0.045	0.150	0.500	17.516	1.419	0.041	0.135	0.450	15.924	1.146	0.036	0.120	0.400
2	8	19.108	1.643	0.043	0.150	0.400	17.516	1.356	0.039	0.135	0.360	15.924	1.096	0.034	0.120	0.320
2	10	19.108	1.911	0.050	0.150	0.400	17.516	1.576	0.045	0.135	0.360	15.924	1.274	0.040	0.120	0.320
2	12	19.108	1.796	0.047	0.120	0.350	17.516	1.482	0.042	0.108	0.315	15.924	1.197	0.038	0.096	0.280
2	14	19.108	1.529	0.040	0.100	0.350	17.516	1.261	0.036	0.090	0.315	15.924	1.019	0.032	0.080	0.280
2	16	19.108	1.338	0.035	0.100	0.300	17.516	1.104	0.032	0.090	0.270	15.924	892	0.028	0.080	0.240
2	18	19.108	1.146	0.030	0.100	0.250	17.516	946	0.027	0.090	0.225	15.924	764	0.024	0.080	0.200
2	20	19.108	1.146	0.030	0.070	0.250	17.516	946	0.027	0.063	0.225	15.924	764	0.024	0.056	0.200
2	22	19.108	1.032	0.027	0.050	0.200	17.516	851	0.024	0.045	0.180	15.924	688	0.022	0.040	0.160
2	25	19.108	1.032	0.027	0.050	0.150	17.516	851	0.024	0.045	0.135	15.924	688	0.022	0.040	0.120
2	30	19.108	955	0.025	0.040	0.100	17.516	788	0.023	0.036	0.090	15.924	637	0.020	0.032	0.080
3	8	12.739	2.038	0.080	0.200	0.600	11.677	1.682	0.072	0.180	0.540	10.616	1.359	0.064	0.160	0.480
3	10	12.739	2.038	0.080	0.200	0.500	11.677	1.682	0.072	0.180	0.450	10.616	1.359	0.064	0.160	0.400
3	16	12.739	1.783	0.070	0.150	0.500	11.677	1.471	0.063	0.135	0.450	10.616	1.189	0.056	0.120	0.400
3	20	12.739	1.656	0.065	0.150	0.400	11.677	1.366	0.059	0.135	0.360	10.616	1.104	0.052	0.120	0.320
3	25	12.739	1.529	0.060	0.130	0.300	11.677	1.261	0.054	0.117	0.270	10.616	1.019	0.048	0.104	0.240
3	30	12.739	1.452	0.057	0.100	0.250	11.677	1.198	0.051	0.090	0.225	10.616	968	0.046	0.080	0.200
3	35	12.739	1.401	0.055	0.080	0.250	11.677	1.156	0.050	0.072	0.225	10.616	934	0.044	0.064	0.200
4	10	9.554	2.293	0.120	0.200	0.800	8.758	1.892	0.108	0.180	0.720	7.962	1.529	0.096	0.160	0.640
4	16	9.554	1.911	0.100	0.200	0.600	8.758	1.576	0.090	0.180	0.540	7.962	1.274	0.080	0.160	0.480
4	20	9.554	1.911	0.100	0.200	0.600	8.758	1.576	0.090	0.180	0.540	7.962	1.274	0.080	0.160	0.480
4	25	9.554	1.720	0.090	0.200	0.500	8.758	1.419	0.081	0.180	0.450	7.962	1.146	0.072	0.160	0.400
4	30	9.554	1.529	0.080	0.200	0.400	8.758	1.261	0.072	0.180	0.360	7.962	1.019	0.064	0.160	0.320
4	35	9.554	1.338	0.070	0.150	0.400	8.758	1.104	0.063	0.135	0.360	7.962	892	0.056	0.120	0.320
4	40	9.554	1.146	0.060	0.150	0.400	8.758	946	0.054	0.135	0.360	7.962	764	0.048	0.120	0.320
4	45	9.554	1.146	0.060	0.100	0.300	8.758	946	0.054	0.090	0.270	7.962	764	0.048	0.080	0.240
4	50	9.554	955	0.050	0.100	0.300	8.758	788	0.045	0.090	0.270	7.962	637	0.040	0.080	0.240
5	20	7.643	1.987	0.130	0.250	1.000	7.006	1.639	0.117	0.225	0.900	6.369	1.325	0.104	0.200	0.800
5	25	7.643	1.834	0.120	0.250	0.900	7.006	1.513	0.108	0.225	0.810	6.369	1.223	0.096	0.200	0.720
5	30	7.643	1.529	0.100	0.250	0.800	7.006	1.261	0.090	0.225	0.720	6.369	1.019	0.080	0.200	0.640
5	35	7.643	1.529	0.100	0.250	0.600	7.006	1.261	0.090	0.225	0.540	6.369	1.019	0.080	0.200	0.480
6	30	6.369	1.783	0.140	0.420	1.300	5.839	1.471	0.126	0.378	1.170	5.308	1.189	0.112	0.336	1.040
6	50	6.369	1.401	0.110	0.200	0.500	5.839	1.156	0.099	0.180	0.450	5.308	934	0.088	0.160	0.400

Max. cutting depth  
Maximale Schnitttiefe  
Profondità di taglio  
Profondeur de coupe



Attention : sparks and/or flames can cause coolant fire. Be sure adequate fire prevention is available.

- Speeds and feeds are designed to be used in conjunction with small passes on a high speed & precision machine set-up.
- Do not use inflammable coolant. Using worn tools may generate sparks.
- Use compressed air or a high quality coolant with a low co-efficient of smoke emission.  
\* Modified parameters

Achtung: Funken und/oder Flammen können den Kühlschmierstoff entzünden. stellen Sie einen ausreichenden Brandschutz sicher.

- Die Schnittdaten sind ausgelegt für geringe Zustellungen in Verbindung mit HSC tauglichen Maschinen und Spanmitteln.
- Bitte geeignetes Kühlmittel mit rauchhemmenden Zusätzen verwenden.
- Benutzen Sie Druckluft oder das Kühlmittel mit rauchhemmenden Zusätzen.  
\* Modifizierten Parameters

Attenzione: le scintille prodotte durante l'operazione o il calore causato dalla rottura dell'utensile possono infiammare il lubrificante. Assicurarsi che siano applicate delle adeguate misure di prevenzione.

- Queste velocità e questi avanzamenti sono indicati per fresatura di piccole passate ad alta velocità e centri di lavorazione di alta precisione.
- Non utilizzare lubrificanti da taglio infiammabili; gli utensili troppo usurati possono produrre scintille.
- Utilizzare un getto di aria compressa. Se la vostra scelta ricade su dei liquidi da taglio, sceglierli di alta qualità, dotati di un coefficiente elevato di rallentamento d'emissione del fumo.  
\* Parametro modificato

Attention : étincelles et/ou chaleur peuvent enflammer le lubrifiant. S'assurer que des mesures de prévention adéquates sont appliquées.

- Les vitesses et avances sont indiquées pour le fraisage de petites passes à haute vitesse / centres d'usinage de haute précision.
- Ne pas utiliser de lubrifiants de coupe inflammables, les outils fortement usés peuvent produire des étincelles.
- Utilisez un jet d'air comprimé ou des fluides de coupe de haute qualité avec un coef. élevé de ralentissement d'émission de fumée.  
\* Paramètres modifiés

WXS

Conditions - Schnittwerte - Condizioni - Conditions

WXS-LN-EBD - WX-LN-EBD - FX-LN-EBD-6

High speed milling - HSC Schlichtfräsen -  
Fresatura alta velocità - Fraisage UGV

WX-LN-EBD: Parameters only until 45 HRC - Parameters bis 45 HRC - Parameto a 45 HRC - Paramètres jusque 45HRC

Work material Werkstoff Materiale Matière à usiner		38~45 HRC - SUS 35NCD16 38~45 HRC					45~55 HRC Z38CDV5 45~55 HRC					55~60 HRC Z160CDV12 55~60 HRC				
		100 (m/min)					70 (m/min)					50 (m/min)				
Ø	Lg (mm)	S <sub>c</sub> (min <sup>-1</sup> )	F <sub>c</sub> (mm/min)	AZ (mm)	a <sub>a</sub> (mm)	pf (mm)	S <sub>c</sub> (min <sup>-1</sup> )	F <sub>c</sub> (mm/min)	AZ (mm)	a <sub>a</sub> (mm)	pf (mm)	S <sub>c</sub> (min <sup>-1</sup> )	F <sub>c</sub> (mm/min)	AZ (mm)	a <sub>a</sub> (mm)	pf (mm)
0.2	0.5	50.000	320	0.003	0.016	0.048	50.000	300	0.003	0.014	0.043	50.000	240	0.002	0.010	0.030
0.2	1	50.000	320	0.003	0.008	0.019	50.000	300	0.003	0.007	0.017	50.000	240	0.002	0.005	0.012
0.2	1.5	50.000	320	0.003	0.006	0.008	50.000	300	0.003	0.006	0.007	50.000	240	0.002	0.004	0.005
0.3	1	50.000	480	0.005	0.016	0.050	50.000	450	0.005	0.014	0.045	50.000	360	0.004	0.010	0.032
0.3	1.5	50.000	480	0.005	0.012	0.032	50.000	450	0.005	0.011	0.029	50.000	360	0.004	0.008	0.020
0.3	2	50.000	480	0.005	0.010	0.029	50.000	450	0.005	0.009	0.026	50.000	360	0.004	0.006	0.018
0.4	1	50.000	720	0.007	0.032	0.096	40.000	540	0.007	0.029	0.086	40.000	432	0.005	0.020	0.060
0.4	1.5	50.000	720	0.007	0.016	0.080	40.000	540	0.007	0.014	0.071	40.000	432	0.005	0.010	0.050
0.4	2	50.000	720	0.007	0.016	0.048	40.000	540	0.007	0.014	0.043	40.000	432	0.005	0.010	0.030
0.4	2.5	50.000	640	0.006	0.016	0.040	40.000	480	0.006	0.014	0.036	40.000	384	0.005	0.010	0.025
0.4	3	50.000	640	0.006	0.016	0.038	40.000	480	0.006	0.014	0.034	39.809	382	0.005	0.010	0.024
0.5	2	40.000	960	0.012	0.016	0.056	40.000	900	0.011	0.014	0.050	31.847	573	0.009	0.010	0.035
0.5	3	40.000	768	0.010	0.016	0.052	40.000	720	0.009	0.014	0.046	31.847	459	0.007	0.010	0.033
0.5	4	40.000	704	0.009	0.016	0.048	40.000	660	0.008	0.014	0.043	31.847	420	0.007	0.010	0.030
0.5	5	40.000	704	0.009	0.016	0.040	40.000	660	0.008	0.014	0.036	31.847	420	0.007	0.010	0.025
0.5	6	40.000	704	0.009	0.010	0.031	40.000	660	0.008	0.009	0.028	31.847	420	0.007	0.007	0.020
0.5	8	40.000	576	0.007	0.008	0.024	40.000	540	0.007	0.007	0.021	31.847	344	0.005	0.005	0.015
0.6	2	40.000	1.024	0.013	0.024	0.080	40.000	960	0.012	0.021	0.071	26.539	510	0.010	0.015	0.050
0.6	3	40.000	960	0.012	0.024	0.080	40.000	900	0.011	0.021	0.071	26.539	478	0.009	0.015	0.050
0.6	4	40.000	832	0.010	0.024	0.080	40.000	780	0.010	0.021	0.071	26.539	414	0.008	0.015	0.050
0.6	5	40.000	768	0.010	0.024	0.080	40.000	720	0.009	0.021	0.071	26.539	382	0.007	0.015	0.050
0.6	6	40.000	704	0.009	0.024	0.080	40.000	660	0.008	0.021	0.071	26.539	350	0.007	0.015	0.050
0.6	8	40.000	704	0.009	0.014	0.080	37.155	613	0.008	0.012	0.071	26.539	350	0.007	0.009	0.050
0.8	2	40.000	1.152	0.014	0.040	0.120	27.866	752	0.014	0.036	0.107	19.904	430	0.011	0.025	0.075
0.8	4	40.000	1.152	0.014	0.032	0.080	27.866	752	0.014	0.029	0.071	19.904	430	0.011	0.020	0.050
0.8	5	40.000	1.152	0.014	0.032	0.080	27.866	752	0.014	0.029	0.071	19.904	430	0.011	0.020	0.050
0.8	6	40.000	1.152	0.014	0.028	0.080	27.866	752	0.014	0.025	0.071	19.904	430	0.011	0.018	0.050
0.8	7	40.000	1.088	0.014	0.024	0.007	27.866	711	0.013	0.021	0.066	19.904	406	0.010	0.015	0.005
0.8	8	40.000	960	0.012	0.024	0.056	27.866	627	0.011	0.021	0.050	19.904	358	0.009	0.015	0.035
0.8	10	40.000	960	0.012	0.016	0.048	27.866	627	0.011	0.014	0.043	19.904	358	0.009	0.010	0.030
1	3	40.000	1.600	0.020	0.080	0.160	22.293	836	0.019	0.071	0.143	15.924	478	0.015	0.050	0.100
1	4	40.000	1.408	0.018	0.056	0.160	22.293	736	0.017	0.050	0.143	15.924	420	0.013	0.035	0.100
1	5	40.000	1.408	0.018	0.040	0.160	22.293	736	0.017	0.036	0.143	15.924	420	0.013	0.025	0.100
1	6	40.000	1.408	0.018	0.040	0.160	22.293	736	0.017	0.036	0.143	15.924	420	0.013	0.025	0.100
1	7	40.000	1.280	0.016	0.040	0.120	22.293	669	0.015	0.036	0.107	15.924	382	0.012	0.025	0.075
1	8	40.000	1.280	0.016	0.032	0.120	22.293	669	0.015	0.029	0.107	15.924	382	0.012	0.020	0.075
1	9	40.000	1.280	0.016	0.032	0.120	22.293	669	0.015	0.029	0.107	15.924	382	0.012	0.020	0.075
1	10	40.000	1.280	0.016	0.024	0.080	22.293	669	0.015	0.021	0.071	15.924	382	0.012	0.015	0.050
1	12	40.000	960	0.012	0.024	0.080	22.293	502	0.011	0.021	0.071	15.924	287	0.009	0.015	0.050
1	14	40.000	960	0.012	0.024	0.080	22.293	502	0.011	0.021	0.071	15.924	287	0.009	0.015	0.050
1	16	40.000	960	0.012	0.020	0.080	22.293	502	0.011	0.018	0.071	15.924	287	0.009	0.013	0.050
1	20	40.000	960	0.012	0.016	0.064	22.293	502	0.011	0.014	0.057	15.924	287	0.009	0.010	0.040
1.2	6	26.539	1.274	0.024	0.040	0.096	18.577	836	0.023	0.036	0.086	13.270	478	0.018	0.025	0.060
1.2	8	26.539	1.104	0.021	0.032	0.096	18.577	725	0.020	0.029	0.086	13.270	414	0.016	0.020	0.060
1.2	10	26.539	934	0.018	0.024	0.072	18.577	613	0.017	0.021	0.064	13.270	350	0.013	0.015	0.045
1.2	12	26.539	849	0.016	0.016	0.072	18.577	557	0.015	0.014	0.064	13.270	318	0.012	0.010	0.045
1.4	8	22.748	1.092	0.024	0.048	0.160	15.924	717	0.023	0.043	0.143	11.374	409	0.018	0.030	0.100
1.4	12	22.748	1.092	0.024	0.040	0.144	15.924	717	0.023	0.036	0.129	11.374	409	0.018	0.025	0.090
1.4	16	22.748	1.092	0.024	0.032	0.112	15.924	717	0.023	0.029	0.100	11.374	409	0.018	0.020	0.070
1.5	8	21.231	1.121	0.026	0.056	0.144	14.862	736	0.025	0.050	0.129	10.616	420	0.020	0.035	0.090
1.5	12	21.231	1.121	0.026	0.056	0.144	14.862	736	0.025	0.050	0.129	10.616	420	0.020	0.035	0.090
1.5	16	21.231	951	0.022	0.040	0.112	14.862	624	0.021	0.036	0.100	10.616	357	0.017	0.025	0.070
1.5	20	21.231	849	0.020	0.032	0.096	14.862	557	0.019	0.029	0.086	10.616	318	0.015	0.020	0.060
1.6	8	19.904	1.115	0.028	0.056	0.160	13.933	731	0.026	0.050	0.143	9.952	418	0.021	0.035	0.100
1.6	12	19.904	1.019	0.026	0.056	0.160	13.933	669	0.024	0.050	0.143	9.952	382	0.019	0.035	0.100
1.6	16	19.904	955	0.024	0.040	0.120	13.933	627	0.023	0.036	0.107	9.952	358	0.018	0.025	0.075
1.6	20	19.904	796	0.020	0.032	0.096	13.933	522	0.019	0.029	0.086	9.952	299	0.015	0.020	0.060
1.8	8	17.693	1.161	0.033	0.064	0.200	12.385	762	0.031	0.057	0.179	8.846	435	0.025	0.040	0.125
1.8	12	17.693	991	0.028	0.064	0.160	12.385	650	0.026	0.057	0.143	8.846	372	0.021	0.040	0.100
1.8	16	17.693	849	0.024	0.048	0.120	12.385	557	0.023	0.043	0.107	8.846	318	0.018	0.030	0.075
1.8	20	17.693	764	0.022	0.040	0.108	12.385	502	0.020	0.036	0.096	8.846	287	0.016	0.025	0.068
2	4	15.924	1.274	0.040	0.144	0.400	11.146	836	0.038	0.129	0.357	7.962	478	0.030	0.090	0.250
2	6	15.924	1.146	0.036	0.120	0.400	11.146	752	0.034	0.107	0.357	7.962	430	0.027	0.075	0.250

WXS

OSG Europe : www.osgeurope.com

## Conditions - Schnittwerte - Condizioni - Conditions

High speed milling - HSC Schlichtfräsen -  
Fresatura alta velocità - Fraisage UGV

WXS-LN-EBD - WX-LN-EBD - FX-LN-EBD-6



Work material Werkstoff Materiale Matière à usiner		38~45 HRC - SUS					45~55 HRC					55~60 HRC				
		35NCD16 38~45 HRC					Z38CDV5 45~55 HRC					Z160CDV12 55~60 HRC				
		100 (m/min)					70 (m/min)					50 (m/min)				
Ø	Lg (mm)	S. (min <sup>-1</sup> )	F. (mm/min)	AZ (mm)	aa (mm)	pf (mm)	S. (min <sup>-1</sup> )	F. (mm/min)	AZ (mm)	aa (mm)	pf (mm)	S. (min <sup>-1</sup> )	F. (mm/min)	AZ (mm)	aa (mm)	pf (mm)
2	8	15.924	1.096	0.034	0.120	0.320	11.146	719	0.032	0.107	0.286	7.962	411	0.026	0.075	0.200
2	10	15.924	1.274	0.040	0.120	0.320	11.146	836	0.038	0.107	0.286	7.962	478	0.030	0.075	0.200
2	12	15.924	1.197	0.038	0.096	0.280	11.146	786	0.035	0.086	0.250	7.962	449	0.028	0.060	0.175
2	14	15.924	1.019	0.032	0.080	0.280	11.146	669	0.030	0.071	0.250	7.962	382	0.024	0.050	0.175
2	16	15.924	892	0.028	0.080	0.240	11.146	585	0.026	0.071	0.214	7.962	334	0.021	0.050	0.150
2	18	15.924	764	0.024	0.080	0.200	11.146	502	0.023	0.071	0.179	7.962	287	0.018	0.050	0.125
2	20	15.924	764	0.024	0.056	0.200	11.146	502	0.023	0.050	0.179	7.962	287	0.018	0.035	0.125
2	22	15.924	688	0.022	0.040	0.160	11.146	451	0.020	0.036	0.143	7.962	258	0.016	0.025	0.100
2	25	15.924	688	0.022	0.040	0.120	11.146	451	0.020	0.036	0.107	7.962	258	0.016	0.025	0.075
2	30	15.924	637	0.020	0.032	0.080	11.146	418	0.019	0.029	0.071	7.962	239	0.015	0.020	0.050
3	8	10.616	1.359	0.064	0.160	0.480	7.431	892	0.060	0.143	0.429	5.308	510	0.048	0.100	0.300
3	10	10.616	1.359	0.064	0.160	0.400	7.431	892	0.060	0.143	0.357	5.308	510	0.048	0.100	0.250
3	16	10.616	1.189	0.056	0.120	0.400	7.431	780	0.053	0.107	0.357	5.308	446	0.042	0.075	0.250
3	20	10.616	1.104	0.052	0.120	0.320	7.431	725	0.049	0.107	0.286	5.308	414	0.039	0.075	0.200
3	25	10.616	1.019	0.048	0.104	0.240	7.431	669	0.045	0.093	0.214	5.308	382	0.036	0.065	0.150
3	30	10.616	968	0.046	0.080	0.200	7.431	635	0.043	0.071	0.179	5.308	363	0.034	0.050	0.125
3	35	10.616	934	0.044	0.064	0.200	7.431	613	0.041	0.057	0.179	5.308	350	0.033	0.040	0.125
4	10	7.962	1.529	0.096	0.160	0.640	5.573	1.003	0.090	0.143	0.571	3.981	573	0.072	0.100	0.400
4	16	7.962	1.274	0.080	0.160	0.480	5.573	836	0.075	0.143	0.429	3.981	478	0.060	0.100	0.300
4	20	7.962	1.274	0.080	0.160	0.480	5.573	836	0.075	0.143	0.429	3.981	478	0.060	0.100	0.300
4	25	7.962	1.146	0.072	0.160	0.400	5.573	752	0.068	0.143	0.357	3.981	430	0.054	0.100	0.250
4	30	7.962	1.019	0.064	0.160	0.320	5.573	669	0.060	0.143	0.286	3.981	382	0.048	0.100	0.200
4	35	7.962	892	0.056	0.120	0.320	5.573	585	0.053	0.107	0.286	3.981	334	0.042	0.075	0.200
4	40	7.962	764	0.048	0.120	0.320	5.573	502	0.045	0.107	0.286	3.981	287	0.036	0.075	0.200
4	45	7.962	764	0.048	0.080	0.240	5.573	502	0.045	0.071	0.214	3.981	287	0.036	0.050	0.150
4	50	7.962	637	0.040	0.080	0.240	5.573	418	0.038	0.071	0.214	3.981	239	0.030	0.050	0.150
5	20	6.369	1.325	0.104	0.200	0.800	4.459	869	0.098	0.179	0.714	3.185	497	0.078	0.125	0.500
5	25	6.369	1.223	0.096	0.200	0.720	4.459	803	0.090	0.179	0.643	3.185	459	0.072	0.125	0.450
5	30	6.369	1.019	0.080	0.200	0.640	4.459	669	0.075	0.179	0.571	3.185	382	0.060	0.125	0.400
5	35	6.369	1.019	0.080	0.200	0.480	4.459	669	0.075	0.179	0.429	3.185	382	0.060	0.125	0.300
6	30	5.308	1.189	0.112	0.336	1.040	3.715	780	0.105	0.300	0.929	2.654	446	0.084	0.210	0.650
6	50	5.308	934	0.088	0.160	0.400	3.715	613	0.083	0.143	0.357	2.654	350	0.066	0.100	0.250

Max. cutting depth  
Maximale Schnitttiefe  
Profondità di taglio  
Profondeur de coupe



Attention : sparks and/or flames can cause coolant fire. Be sure adequate fire prevention is available.

- Speeds and feeds are designed to be used in conjunction with small passes on a high speed & precision machine set-up.
- Do not use inflammable coolant. Using worn tools may generate sparks.
- Use compressed air or a high quality coolant with a low co-efficient of smoke emission.  
\* Modified parameters

Achtung: Funken und/oder Flammen können den Kühlschmierstoff entzünden. stellen Sie einen ausreichenden Brandschutz sicher.

- Die Schnittdaten sind ausgelegt für geringe Zustellungen in Verbindung mit HSC tauglichen Maschinen und Spannmittel.
- Bitte geeignetes Kühlmittel mit rauchhemmenden Zusätzen verwenden.
- Benutzen Sie Druckluft oder das Kühlmittel mit rauchhemmenden Zusätzen.  
\* Modifizierten Parameters

Attenzione: le scintille prodotte durante l'operazione o il calore causato dalla rottura dell'utensile possono infiammare il lubrificante. Assicurarsi che siano applicate delle adeguate misure di prevenzione.

- Queste velocità e questi avanzamenti sono indicati per fresatura di piccole passate ad alta velocità e centri di lavorazione di alta precisione.
- Non utilizzare lubrificanti da taglio infiammabili; gli utensili troppo usurati possono produrre scintille.
- Utilizzare un getto di aria compressa. Se la vostra scelta ricade su dei liquidi da taglio, sceglierli di alta qualità, dotati di un coefficiente elevato di rallentamento d'emissione del fumo.  
\* Parametro modificato

Attention : étincelles et/ou chaleur peuvent enflammer le lubrifiant. S'assurer que des mesures de prévention adéquates sont appliquées.

- Les vitesses et avances sont indiquées pour le fraisage de petites passes à haute vitesse / centres d'usinage de haute précision.
- Ne pas utiliser de lubrifiants de coupe inflammables, les outils fortement usés peuvent produire des étincelles.
- Utilisez un jet d'air comprimé ou des fluides de coupe de haute qualité avec un coef. élevé de ralentissement d'émission de fumée.  
\* Paramètres modifiés

WXS

Conditions - Schnittwerte - Condizioni - Conditions

WXS - CPR

Regular milling - Normale Bearbeitung  
Parametri di taglio - Fraisage regular



D	α°	L <sub>1</sub>	Max. cutting depth Maximale Schnitttiefe Profondità di passata Profondeur de coupe						Work material - Werkstoff - Materiale - Matière à usiner					
									~45 HRC		45~55 HRC		55~65 HRC	
									SKD61 · NAK55 · NAK80 · HPM1 ~45 HRC		SKD61 · STAVAX · HPM38 45~55 HRC		55~65 HRC	
									S. (min <sup>-1</sup> )		F. (mm/min)		S. (min <sup>-1</sup> )	
			aa					aa = 120%		aa = 100%		aa = 60%		
			ar					ar = 120%		ar = 100%		ar = 80%		
			R0.1	R0.2	R0.3	R0.5	R1	S.	F.	S.	F.	S.	F.	
								ar						
								mm/min		mm/min		mm/min		
0.4	0°	1						0.12	29.500	750	26.000	580	24.500	470
0.4	0°	1.5						0.12	29.500	750	26.000	580	24.500	470
0.4	0°	2						0.102	27.500	675	24.500	520	23.000	420
0.4	0°	3						0.075	23.000	470	20.000	360	19.000	290
0.4	0°	4						0.036	21.000	380	18.500	290	17.500	235
0.4	1°	3						0.12	31.000	755	27.000	580	25.500	470
0.4	1°	4						0.108	29.500	680	26.000	520	24.500	420
0.4	3°	3						0.12	31.000	795	27.000	610	25.500	495
0.4	3°	4						0.12	29.500	750	26.000	580	24.500	470
0.4	5°	3						0.12	31.000	795	27.000	610	25.500	495
0.4	5°	4						0.12	29.500	750	26.000	580	24.500	470
0.5	0°	1	0.02					0.15	29.000	820	26.000	670	26.000	620
0.5	0°	2	0.02					0.15	29.000	820	26.000	670	26.000	620
0.5	0°	3	0.01					0.105	27.500	695	24.500	570	24.500	525
0.5	0°	4	0.006					0.09	22.500	510	20.000	420	20.000	385
0.5	0°	5	0.004					0.045	21.000	415	18.500	340	18.500	315
0.5	0°	6	0.003					0.03	19.500	360	17.000	295	17.000	270
0.5	1°	3	0.02					0.15	32.500	910	28.500	745	28.500	690
0.5	1°	5	0.015					0.15	29.000	735	26.000	605	26.000	560
0.5	1°	8	0.009					0.052	25.500	560	22.500	460	22.500	425
0.5	1°	10	0.006					0.022	22.500	475	20.000	390	20.000	360
0.5	1°	12	0.005					0.016	21.000	415	18.500	410	15.500	315
0.5	3°	3	0.02					0.15	32.500	910	28.500	745	28.500	690
0.5	3°	5	0.02					0.15	29.000	820	26.000	670	26.000	620
0.5	3°	8	0.018					0.067	25.500	710	22.500	580	22.500	535
0.5	3°	10	0.005					0.037	22.500	575	20.000	470	20.000	435
0.5	3°	12	0.004					0.031	21.000	475	18.500	390	18.500	360
0.5	5°	3	0.02					0.15	32.500	910	28.500	745	28.500	690
0.5	5°	5	0.02					0.15	29.000	820	26.000	670	26.000	620
0.5	5°	8	0.018					0.142	25.500	710	22.500	580	22.500	535
0.5	5°	10	0.015					0.112	22.500	635	20.000	520	20.000	480
0.6	0°	2	0.02					0.18	29.000	980	26.000	805	21.500	620
0.6	0°	4	0.009					0.122	24.500	695	21.500	570	18.000	440
0.6	0°	6	0.004					0.054	21.000	495	18.500	410	15.500	315
0.8	0°	4	0.016	0.032				0.24	23.500	1.000	20.500	800	17.000	565
0.8	0°	6	0.007	0.014				0.24	19.500	700	16.500	555	14.000	390
0.8	0°	8	0.004	0.008				0.216	18.000	570	15.500	450	13.000	320
0.8	1°	5	0.02	0.04				0.24	26.500	1.150	26.500	1.050	26.500	905
0.8	1°	8	0.015	0.03				0.24	25.000	1.000	25.000	940	25.000	795
0.8	3°	5	0.02	0.04				0.24	26.500	1.200	26.500	1.100	26.500	940
0.8	3°	8	0.02	0.04				0.24	25.000	1.100	25.000	1.050	25.000	880

WXS

Conditions - Schnittwerte - Condizioni - Conditions

Regular milling - Normale Bearbeitung  
 Parametri di taglio - Fraisage regular

WXS - CPR



D	α°	L <sub>1</sub>	Max. cutting depth Maximale Schnitttiefe Profondità di passata Profondeur de coupe						Work material - Werkstoff - Materiale - Matière à usiner					
									~45 HRC		45~55 HRC		55~65 HRC	
									SKD61 · NAK55 · NAK80 · HPM1 ~45 HRC		SKD61 · STAVAX · HPM38 45~55 HRC		55~65 HRC	
									S. (min <sup>-1</sup> )		F. (mm/min)		S. (min <sup>-1</sup> )	
								aa = 120%	ar = 120%	aa = 100%	ar = 100%	aa = 60%	ar = 80%	
			R0.1	R0.2	R0.3	R0.5	R1							
								ar						
1	0°	4	0.02	0.04	0.06			0.3	23.000	1.300	20.000	1.050	17.000	755
1	0°	6	0.01	0.02	0.03			0.21	20.500	1.050	18.000	835	15.500	605
1	0°	8	0.006	0.012	0.018			0.18	18.000	780	15.500	650	13.500	470
1	0°	10	0.004	0.008	0.012			0.09	16.500	650	14.500	530	12.500	380
1	0°	12	0.003	0.006	0.009			0.06	15.500	565	13.500	460	11.500	335
1	0°	16	0.002	0.004	0.006			0.03	12.000	400	10.500	325	9.150	235
1	0°	20	0.001	0.003	0.004			0.024	10.000	285	8.00	230	7.650	170
1	1°	6	0.02	0.04	0.06			0.3	25.500	1.250	22.500	1.150	19.000	840
1	1°	10	0.015	0.03	0.045			0.27	23.000	1.150	20.000	940	17.000	680
1	1°	15	0.01	0.02	0.03			0.12	20.500	915	18.000	740	15.500	540
1	1°	20	0.006	0.012	0.018			0.045	18.000	750	15.500	610	13.500	440
1	1°	25	0.002	0.004	0.006			0.03	16.500	650	14.500	530	12.500	380
1	1°	30	0.001	0.002	0.004			0.021	12.500	465	11.000	380	9.550	275
1	1°	35	0.001	0.002	0.003			0.015	11.500	385	10.000	315	8.600	230
1	3°	6	0.02	0.04	0.06			0.3	25.500	1.450	22.500	1.150	19.000	840
1	3°	10	0.02	0.04	0.06			0.3	23.000	1.300	20.000	1.050	17.000	755
1.2	0°	6		0.032	0.048			0.36	19.000	1.200	18.000	1.050	14.500	735
1.2	0°	8		0.018	0.027			0.252	17.000	965	16.000	845	13.000	580
1.2	0°	10		0.011	0.016			0.216	16.000	850	15.000	740	12.000	510
1.5	0°	6	0.02	0.04	0.06			0.45	17.000	1.450	16.000	1.250	13.500	880
1.5	0°	8	0.013	0.026	0.039			0.382	16.000	1.250	15.500	1.100	12.500	750
1.5	0°	10	0.009	0.018	0.027			0.292	14.500	1.000	13.500	900	11.000	625
1.5	0°	12	0.006	0.012	0.018			0.27	13.500	900	12.500	790	10.500	550
1.5	0°	16	0.003	0.007	0.01			0.112	9.150	525	8.650	460	7.150	320
1.5	1°	10	0.019	0.039	0.049			0.45	18.500	1.500	17.500	1.300	14.500	905
1.5	1°	15	0.015	0.03	0.037			0.405	17.000	1.150	16.000	1.000	13.500	705
1.5	1°	20	0.01	0.02	0.025			0.27	15.500	1.100	15.000	970	12.000	675
1.5	1°	25	0.008	0.008	0.01			0.135	14.500	950	13.500	835	11.500	580
1.5	1°	30	0.003	0.006	0.0075			0.067	13.500	840	12.500	740	10.500	515
1.5	3°	10	0.02	0.04	0.05			0.45	18.500	1.550	17.500	1.350	14.500	940
1.5	3°	15	0.02	0.04	0.05			0.45	17.000	1.450	16.000	1.250	13.500	880
2	0°	8	0.02	0.04	0.06	0.075		0.6	13.000	1.450	13.000	1.300	11.500	1.000
2	0°	10	0.016	0.032	0.048	0.06		0.51	12.000	1.300	12.000	1.150	11.000	905
2	0°	12	0.01	0.02	0.03	0.037		0.42	11.500	1.150	11.500	1.050	10.000	810
2	0°	16	0.006	0.012	0.018	0.022		0.36	10.000	900	10.000	800	8.900	630
2	0°	20	0.004	0.008	0.012	0.015		0.18	9.300	730	9.300	650	8.2250	510
2	0°	25	0.002	0.004	0.007	0.009		0.12	8.600	625	8.600	560	7.650	440
2	1°	15	0.018	0.036	0.046	0.064		0.6	13.500	1.450	13.500	1.300	12.000	1.000
2	1°	20	0.015	0.03	0.037	0.052		0.54	13.000	1.300	13.000	1.150	11.500	910
2	1°	25	0.012	0.024	0.03	0.04		0.39	12.000	1.150	12.000	1.050	11.000	810
2	1°	30	0.01	0.02	0.025	0.03		0.24	11.500	1.050	11.500	920	10.000	720
2	1°	40	0.006	0.012	0.015	0.02		0.09	10.000	840	10.000	750	8.900	590
2	1°	50	0.005	0.01	0.015	0.01		0.06	9.300	730	9.300	650	8.250	510

WXS

OSG Europe : www.osgeurope.com

## Conditions - Schnittwerte - Condizioni - Conditions

WXS - CPR

Regular milling - Normale Bearbeitung  
Parametri di taglio - Fraisage regular

D	$\alpha^\circ$	$L_1$	Work material - Werkstoff - Materiale - Matière à usiner												
			~45 HRC					45~55 HRC				55~65 HRC			
			SKD61 · NAK55 · NAK80 · HPM1 ~45 HRC					SKD61 · STAVAX · HPM38 45~55 HRC				55~65 HRC			
			a <sub>a</sub>					a <sub>a</sub> = 120%		a <sub>a</sub> = 100%		a <sub>a</sub> = 60%		a <sub>a</sub> = 80%	
			R0.1	R0.2	R0.3	R0.5	R1	a <sub>r</sub>	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	
2	3°	15	0.02	0.04	0.06	0.075		0.6	13.500	1.500	13.500	1.350	12.000	1.050	
2	3°	20	0.02	0.04	0.06	0.075		0.6	13.000	1.450	13.000	1.300	11.500	1.000	
2.5	0°	10		0.04		0.075		0.75	11.500	1.600	10.500	1.200	9.150	1.000	
2.5	0°	20		0.02		0.037		0.45	8.900	1.000	8.000	740	7.150	630	
2.5	0°	30		0.006		0.011		0.15	7.650	700	6.850	520	6.100	445	
3	0°	8		0.04	0.06	0.075	0.1	0.9	9.550	1.500	8.600	1.150	7.650	825	
3	0°	12		0.04	0.06	0.075	0.1	0.9	9.550	1.500	8.600	1.150	7.650	825	
3	0°	16		0.028	0.042	0.052	0.07	0.72	8.500	1.200	7.650	910	6.800	660	
3	0°	20		0.018	0.027	0.033	0.045	0.612	7.400	985	6.700	750	5.950	545	
3	0°	25		0.012	0.018	0.022	0.03	0.54	7.100	830	6.400	635	5.700	460	
3	0°	30		0.008	0.012	0.015	0.02	0.27	6.900	755	6.200	575	5.500	420	
3	0°	35		0.006	0.009	0.011	0.015	0.18	6.350	655	5.700	500	5.100	365	
3	1°	15		0.04	0.06	0.075	0.1	0.9	10.500	1.650	9.550	1.250	8.500	920	
3	1°	20		0.039	0.058	0.07	0.08	0.9	9.950	1.500	8.950	1.150	7.950	830	
3	1°	30		0.03	0.045	0.05	0.07	0.81	9.550	1.350	8.600	1.000	7.650	745	
3	1°	40		0.022	0.033	0.04	0.05	0.522	8.900	1.150	8.000	890	7.150	650	
3	1°	50		0.016	0.024	0.03	0.04	0.297	8.050	980	7.250	750	6.450	545	
3	1°	60		0.012	0.018	0.02	0.02	0.135	7.400	870	6.700	660	5.950	480	
4	0°	16		0.04	0.06	0.075	0.12	1.2	7.150	2.050	6.450	1.550	5.000	965	
4	0°	20		0.032	0.048	0.06	0.2	1.02	6.750	1.950	6.100	1.450	4.750	910	
4	0°	25		0.02	0.03	0.037	0.06	0.816	5.950	1.700	5.350	1.300	4.150	800	
4	0°	30		0.014	0.021	0.026	0.04	0.744	5.550	1.600	5.000	1.200	3.900	750	
4	0°	40		0.008	0.012	0.015	0.024	0.36	5.150	1.500	4.650	1.100	3.600	695	
4	0°	50		0.004	0.007	0.009	0.014	0.216	4.550	1.300	4.100	980	3.150	610	

1. Use a rigid and precise machine and holder.
2. When machining carbon steels or hardened steels, using MQL (Minimum Quantity Lubrication / mist coolant) is recommended.
3. The above condition shows an approximate standard for contouring operation (side milling) with a low machining load. If abnormal cutting sounds, vibration or chattering occur depending on the machine shape, cutting amount, rigidity of the machine or work holding condition etc., please adjust the speed, feed and the depth of cut.
4. Adjust the speed, feed rate, and depth of cut if chattering, vibration or abnormal grinding sounds occur.
5. Helical or ramp milling is recommended during the approach of a Z cut.
6. Adjust the speed, feed rate, and the depth of the cut according to the shape of the work, rigidity of the machine, and how the work is held.

1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spannmittel.
2. Wir empfehlen Luft-oder Minimalen Kühlung für bearbeitung wie Kohlenstoffstahl und Gehärteter Stahl.
3. Die oben angegeben Schnittwerte sind für Konturoperationen mit optimalen Aufmaßen. Bei abnormalem Geräuschen, Vibrationen die sich durch die Kontur ergeben, zu hohes Aufmaß, Stabilität der Aufspannung, Werkstück oder der Maschine müssen die Drehzahlen und der Vorschub oder Aufmaß entsprechend korrigiert werden.
4. Falls Vibrationen auftreten sollten, Vorschub und Schnittgeschwindigkeit reduzieren.
5. Axiale Z-Zustellung sollte im Helixverfahren oder im Ramping durchgeführt werden.
6. Schnittdaten und Zustelltiefe bitte nach gewünschter Oberflächengüte, Stabilität der Maschine und Stabilität der Werkstückklemmung auswählen bzw. verändern.

1. Utilizzare su macchine e mandrini ad alta precisione e rigidezza.
2. È consigliabile utilizzare lubrificazione minimale (MQL).
3. La presente tabella si riferisce a parametri approssimativi di operazioni di contornatura. Eventuali vibrazioni o rumore anomalo di taglio dipendono dal tipo di macchina, rigidezza e profondità di passata. Regolare velocità, avanzamento e passata di taglio.
4. Ridurre velocità, avanzamento e passata di taglio se si innescano vibrazioni.
5. Si consiglia di iniziare la lavorazione con un'entrata in rampa.
6. Regolare velocità e l'avanzamento in funzione del tipo di lavorazione e del tipo di macchina.

1. Utilisez une machine et un attachement rigide et précis.
2. Pour l'usinage des aciers au carbone et des aciers trempé, l'utilisation de MQL (Pulvérisation) est recommandée.
3. Les conditions ci-dessus sont des standards approx. pour des opérations de contournage avec un charge machine réduite. En cas des bruits d'usinage anormaux et/ou des vibrations dépendants de la géométrie de la pièce, conditions de coupe, rigidité de la machine et/ou clamage, etc. ..., ajustez la vitesse, l'avance et/ou la profondeur de coupe.
4. Ajustez la vitesse, avance et/ou profondeur de coupe en cas de vibrations et/ou bruits d'usinage anormaux.
5. Le fraisage hélicoïdale ou fraisage en pente est recommandé pendant l'approche en Z.
6. Ajustez la vitesse, avance et profondeur de coupe en concordance avec la forme de la pièce, la rigidité de la machine et les conditions de clamage.



Conditions - Schnittwerte - Condizioni - Conditions

WXS - CPR

Side milling (Contour line finish) - Schlichten  
Finatura in contornatura - Contournage (Finition)



D	α°	L <sub>1</sub>	Max. cutting depth Maximale Schnitttiefe Profondità di passata Profondeur de coupe						Work material - Werkstoff - Materiale - Matière à usiner					
									~45 HRC		45~55 HRC		55~65 HRC	
									SKD61 · NAK55 · NAK80 · HPM1 ~45 HRC		SKD61 · STAVAX · HPM38 45~55 HRC		55~65 HRC	
									S. (min <sup>-1</sup> )		F. (mm/min)		S. (min <sup>-1</sup> )	
			aa					aa = 120%		aa = 100%		aa = 60%		
								ar = 120%		ar = 100%		ar = 80%		
			R0.1	R0.2	R0.3	R0.5	R1	ar						
1	0°	4	0.015	0.02	0.03			0.03	27.000	1.500	24.500	1.250	22.500	995
1	0°	6	0.015	0.02	0.03			0.027	24.000	1.200	21.500	1.000	20.000	800
1	0°	8	0.009	0.012	0.018			0.021	21.000	950	19.000	790	17.500	620
1	0°	10	0.006	0.008	0.012			0.015	19.500	770	17.500	640	16.500	505
1	0°	12	0.004	0.006	0.009			0.013	18.000	670	16.000	560	15.000	440
1	0°	16	0.003	0.004	0.006			0.01	14.500	470	13.000	390	12.000	310
1	0°	20	0.003	0.003	0.004			0.009	12.000	340	11.000	280	10.000	220
1	1°	6	0.015	0.02	0.03			0.03	30.000	1.700	27.000	1.400	25.000	1.100
1	1°	10	0.015	0.02	0.03			0.03	27.000	1.350	24.500	1.150	22.500	895
1	1°	15	0.01	0.014	0.021			0.021	24.000	1.100	21.500	900	20.000	710
1	1°	20	0.007	0.01	0.015			0.018	21.000	890	19.000	740	17.500	580
1	1°	25	0.006	0.008	0.012			0.012	19.500	770	17.500	640	16.500	505
1	1°	30	0.003	0.004	0.006			0.009	15.000	550	13.500	460	12.500	360
1	1°	35	0.001	0.002	0.003			0.007	13.500	460	12.000	380	11.500	300
1	3°	6	0.015	0.02	0.03			0.3	30.000	1.700	27.000	1.400	25.000	1.100
1	3°	10	0.006	0.008	0.012			0.015	27.000	1.500	24.500	1.250	22.500	995
1.2	0°	6		0.016	0.024			0.036	22.500	1.450	21.000	1.250	19.000	960
1.2	0°	8		0.009	0.013			0.028	20.000	1.150	18.500	980	17.000	760
1.2	0°	10		0.005	0.008			0.021	18.500	1.000	17.500	860	16.000	670
1.5	0°	6	0.015	0.02	0.03			0.045	21.000	1.750	18.500	1.450	16.000	1.050
1.5	0°	8	0.015	0.02	0.03			0.045	20.000	1.500	17.500	1.250	15.500	910
1.5	0°	10	0.013	0.018	0.027			0.036	17.500	1.250	15.500	1.050	13.500	760
1.5	0°	12	0.009	0.012	0.018			0.031	16.500	1.100	14.500	910	12.500	670
1.5	0°	16	0.006	0.008	0.012			0.022	11.000	640	10.000	530	8.650	390
1.5	1°	10	0.015	0.02	0.03			0.045	22.500	1.800	20.000	1.500	17.500	1.100
1.5	1°	15	0.015	0.02	0.03			0.045	21.000	1.400	18.500	1.150	16.000	860
1.5	1°	20	0.012	0.016	0.024			0.036	19.000	1.300	17.000	1.100	15.000	820
1.5	1°	25	0.01	0.014	0.021			0.031	17.500	1.150	16.000	960	13.500	705
1.5	1°	30	0.007	0.01	0.015			0.027	16.500	1.050	14.500	850	12.500	625
1.5	3°	10	0.015	0.02	0.03			0.045	22.500	1.900	20.000	1.550	17.500	1.150
1.5	3°	15	0.006	0.008	0.012			0.045	21.000	1.750	18.500	1.450	16.000	1.050
2	0°	8	0.015	0.02	0.03	0.05		0.06	16.500	1.850	16.000	1.600	15.000	1.350
2	0°	10	0.015	0.02	0.03	0.05		0.06	15.500	1.650	15.500	1.450	14.500	1.200
2	0°	12	0.015	0.02	0.03	0.05		0.054	14.500	1.500	14.500	1.300	13.500	1.050
2	0°	16	0.009	0.012	0.018	0.03		0.042	13.000	1.150	12.500	1.000	12.000	830
2	0°	20	0.006	0.008	0.012	0.02		0.03	12.000	935	11.500	820	11.000	675
2	0°	25	0.004	0.006	0.009	0.015		0.027	11.000	800	11.000	700	10.000	580
2	1°	15	0.015	0.02	0.03	0.05		0.06	17.500	1.850	17.000	1.600	16.000	1.350
2	1°	20	0.015	0.02	0.03	0.05		0.06	16.500	1.650	16.000	1.450	15.000	1.200
2	1°	25	0.012	0.017	0.025	0.042		0.054	15.500	1.500	15.500	1.300	14.500	1.050
2	1°	30	0.012	0.016	0.024	0.04		0.048	14.500	1.300	14.500	1.150	13.500	950
2	1°	40	0.007	0.01	0.015	0.025		0.036	13.000	1.100	12.500	945	12.000	780
2	1°	50	0.006	0.008	0.012	0.02		0.024	12.000	935	11.500	820	11.000	675

WXS

# Conditions - Schnittwerte - Condizioni - Conditions

Side milling (Contour line finish) - Schlichten  
 Finatura in contornatura - Contournage (Finition)

WXS - CPR



D	α°	L <sub>1</sub>	Max. cutting depth Maximale Schnitttiefe Profondità di passata Profondeur de coupe								Work material - Werkstoff - Materiale - Matière à usiner					
			a <sub>a</sub>					a <sub>r</sub>	~45 HRC		45~55 HRC		55~65 HRC			
			R0.1	R0.2	R0.3	R0.5	R1		SKD61 · NAK55 · NAK80 · HPM1 ~45 HRC	SKD61 · STAVAX · HPM38 45~55 HRC	55~65 HRC					
			a <sub>a</sub> = 120%		a <sub>a</sub> = 100%		a <sub>a</sub> = 60%		S. (min <sup>-1</sup> )		F. (mm/min)		S. (min <sup>-1</sup> )		F. (mm/min)	
2	3°	15	0.015	0.02	0.03	0.05		0.06	17.500	1.950	17.000	1.700	16.000	1.400		
2	3°	20	0.006	0.008	0.012	0.003		0.06	16.500	1.850	16.000	1.600	15.000	1.350		
2.5	0°	10		0.02		0.05		0.075	13.000	1.850	13.000	1.400	12.000	1.350		
2.5	0°	20		0.012		0.003		0.052	10.000	1.150	10.000	885	9.450	830		
2.5	0°	30		0.006		0.015		0.033	8.800	800	8.650	630	8.100	590		
3	0°	8		0.02	0.03	0.05	0.08	0.08	12.000	2.000	11.000	1.400	10.000	1.100		
3	0°	12		0.02	0.03	0.05	0.08	0.08	12.000	2.000	11.000	1.400	10.000	1.100		
3	0°	16		0.02	0.03	0.05	0.08	0.08	10.500	1.600	9.600	1.150	9.000	875		
3	0°	20		0.02	0.03	0.05	0.08	0.064	9.300	1.350	8.400	940	7.850	725		
3	0°	25		0.012	0.018	0.03	0.048	0.048	8.900	1.100	8.050	795	7.550	610		
3	0°	30		0.008	0.012	0.02	0.032	0.04	8.600	1.000	7.800	720	7.300	555		
3	0°	35		0.006	0.009	0.015	0.024	0.036	7.950	880	7.200	630	6.750	480		
3	1°	15		0.02	0.03	0.05	0.08	0.08	13.500	2.250	12.000	1.600	11.000	1.200		
3	1°	20		0.02	0.03	0.05	0.08	0.08	12.500	2.000	11.500	1.450	10.500	1.100		
3	1°	30		0.02	0.03	0.05	0.08	0.08	12.000	1.800	11.000	1.300	10.000	985		
3	1°	40		0.018	0.027	0.045	0.072	0.064	11.000	1.550	10.000	1.100	9.450	860		
3	1°	50		0.014	0.021	0.035	0.056	0.056	10.000	1.300	9.100	940	8.550	720		
3	1°	60		0.01	0.015	0.025	0.04	0.048	9.300	1.150	8.400	830	7.850	640		
4	0°	16		0.02	0.03	0.05	0.08	0.08	7.900	2.500	7.150	2.050	6.450	1.450		
4	0°	20		0.02	0.03	0.05	0.08	0.08	7.450	2.400	6.750	1.950	6.100	1.350		
4	0°	25		0.02	0.03	0.05	0.08	0.072	6.550	2.000	5.950	1.650	5.350	1.150		
4	0°	30		0.014	0.021	0.035	0.056	0.056	6.100	1.650	5.550	1.350	5.000	955		
4	0°	40		0.008	0.012	0.02	0.032	0.04	5.700	1.300	5.150	1.050	4.650	730		
4	0°	50		0.006	0.009	0.015	0.024	0.036	5.000	960	4.450	785	4.100	550		

1. Use a rigid and precise machine and holder.
2. When machining carbon steels or hardened steels, using MQL (Minimum Quantity Lubrication / mist coolant) is recommended.
3. The above condition shows an approximate standard for contouring operation (side milling) with a low machining load. If abnormal cutting sounds, vibration or chattering occur depending on the machine shape, cutting amount, rigidity of the machine or work holding condition etc., please adjust the speed, feed and the depth of cut.
4. Adjust the speed, feed rate, and depth of cut if chattering, vibration or abnormal grinding sounds occur.
5. Helical or ramp milling is recommended during the approach of a Z cut.
6. Adjust the speed, feed rate, and the depth of the cut according to the shape of the work, rigidity of the machine, and how the work is held.

1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spannmittel.
2. Wir empfehlen Luft-oder Minimalmengen Kühlung für bearbeitung wie Kohlenstoffstahl und Gehärteter Stahl.
3. Die oben angegebenen Schnittwerte sind für Konturoperationen mit optimalen Aufmaßen. Bei abnormalem Geräuschen, Vibrationen die sich durch die Kontur ergeben, zu hohes Aufmaß, Stabilität der Aufspannung, Werkstück oder der Maschine müssen die Drehzahlen und der Vorschub oder Aufmaß entsprechend korrigiert werden.
4. Falls Vibrationen auftreten sollten, Vorschub und Schnittgeschwindigkeit reduzieren.
5. Axiale Z-Zustellung sollte im Helixverfahren oder im Ramping durchgeführt werden.
6. Schnittdaten und Zustelltiefe bitte nach gewünschter Oberflächengüte, Stabilität der Maschine und Stabilität der Werkstückklemmung auswählen bzw. verändern.

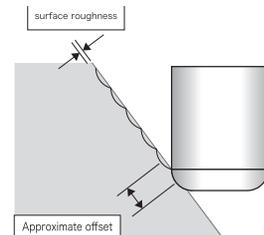
1. Utilizzare su macchine e mandrini ad alta precisione e rigidezza.
2. È consigliabile utilizzare lubrificazione minimale (MQL).
3. La presente tabella si riferisce a parametri approssimativi di operazioni di contornatura. Eventuali vibrazioni o rumore anomalo di taglio dipendono dal tipo di macchina, rigidezza e profondità di passata. Regolare velocità, avanzamento e passata di taglio.
4. Ridurre velocità, avanzamento e passata di taglio se si innescano vibrazioni.
5. Si consiglia di iniziare la lavorazione con un'entrata in rampa.
6. Regolare velocità e l'avanzamento in funzione del tipo di lavorazione e del tipo di macchina.

1. Utilisez une machine et un attachement rigide et précis.
2. Pour l'usinage des aciers au carbone et des aciers trempé, l'utilisation de MQL (Pulvérisation) est recommandée.
3. Les conditions ci-dessus sont des standards approx. pour des opérations de contournage avec un charge machine réduite. En cas des bruits d'usinage anormaux et/ou des vibrations dépendants de la géométrie de la pièce, conditions de coupe, rigidité de la machine et/ou clamage, etc. .... ajustez la vitesse, l'avance et/ou la profondeur de coupe.
4. Ajustez la vitesse, avance et/ou profondeur de coupe en cas de vibrations et/ou bruits d'usinage anormaux.
5. Le fraisage hélicoïdale ou fraisage en pente est recommandé pendant l'approche en Z.
6. Ajustez la vitesse, avance et profondeur de coupe en concordance avec la forme de la pièce, la rigidité de la machine et les conditions de clamage.

## Offset

WXS - CPR

(mm)	μm													
	0.1	0.25	0.5	0.75	1	1.25	1.5	1.75	2	2.5	3	3.5	4	5
0.1	0.009	0.014	0.02	0.024	0.028	0.032	0.035	0.037	0.04	0.045	0.049			
0.2	0.012	0.02	0.028	0.035	0.04	0.045	0.049	0.053	0.057	0.063	0.07	0.075	0.08	0.9
0.3	0.015	0.025	0.035	0.042	0.049	0.055	0.06	0.065	0.07	0.077	0.085	0.092	0.098	0.11
0.5	0.02	0.032	0.045	0.055	0.065	0.07	0.078	0.084	0.09	0.1	0.11	0.118	0.125	0.141
1	0.028	0.045	0.063	0.078	0.09	0.1	0.11	0.111	0.125	0.142	0.155	0.168	0.18	0.2



## Conditions - Schnittwerte - Condizioni - Conditions



WX-EDS - WX-G-EDSS - FX-MG-EDS -  
FX-SS-EDS - FX-CR-MG-EDS - FX-MG-EDSS

Slotting - Nutenfräsen  
Per scanalature profonde - Rainurage

Work material Werkstoff Materiale Matière à usiner	C0,2% - GG			SCM-SKD			30~38 HRC			30~38 HRC			45~55 HRC - SUS			55~60 HRC		
	E24·XC 48·FT25 750 N/mm			35NCD16·40CMD8 ~30 HRC			35NCD16 30~38 HRC			35NCD16 30~38 HRC			Z38CDV5 45~55 HRC			Z160CDV12 55~60 HRC		
	150 (m/min)			130 (m/min)			110 (m/min)			80 (m/min)			60 (m/min)			30 (m/min)		
Ø	S. (min <sup>-1</sup> )	F. (mm/min)	AZ (mm)															
0.2	40000	113	0.0014	40000	113	0.0014	40000	94	0.0012	40000	44	0.0005	40000	38	0.0005	40000	40	0.0005
0.3	40000	144	0.0018	40000	144	0.0018	40000	100	0.0013	40000	69	0.0009	40000	52	0.0007	31847	48	0.0008
0.4	40000	156	0.0020	40000	156	0.0020	40000	113	0.0014	40000	87	0.0011	40000	69	0.0009	23885	48	0.0010
0.5	40000	156	0.0020	40000	169	0.0021	40000	144	0.0018	40000	109	0.0014	38217	82	0.0011	19108	48	0.0013
0.6	40000	156	0.0020	40000	204	0.0026	40000	171	0.0021	40000	130	0.0016	31847	83	0.0013	15924	47	0.0015
0.8	40000	204	0.0026	40000	270	0.0034	40000	232	0.0029	31847	153	0.0024	23885	82	0.0017	11943	47	0.0020
1	40000	267	0.0033	40000	345	0.0043	35032	252	0.0036	25478	151	0.0030	19108	82	0.0021	9554	47	0.0025
1.5	31847	296	0.0046	27601	329	0.0060	23355	236	0.0051	16985	139	0.0041	12739	101	0.0040	6369	45	0.0035
2	23885	293	0.0061	20701	308	0.0074	17516	225	0.0064	12739	140	0.0055	9554	97	0.0051	4777	43	0.0045
3	15924	430	0.0135	13800	326	0.0118	11677	220	0.0094	8493	143	0.0084	6369	104	0.0082	3185	48	0.0075
4	11943	472	0.0197	10350	391	0.0189	8758	258	0.0147	6369	164	0.0129	4777	109	0.0114	2389	46	0.0097
5	9554	568	0.0297	8280	453	0.0273	7006	257	0.0183	5096	167	0.0164	3822	111	0.0145	1911	46	0.0120
6	7962	555	0.0348	6900	450	0.0326	5839	257	0.0220	4246	170	0.0200	3185	113	0.0177	1592	38	0.0119
8	5971	534	0.0447	5175	450	0.0435	4379	249	0.0284	3185	168	0.0263	2389	104	0.0217	1194	38	0.0157
10	4777	505	0.0528	4140	443	0.0535	3503	250	0.0357	2548	161	0.0317	1911	100	0.0262	955	38	0.0197
12	3981	507	0.0636	3450	441	0.0639	2919	252	0.0431	2123	161	0.0380	1592	90	0.0283	796	30	0.0189
14	3412	503	0.0737	2957	424	0.0717	2502	220	0.0440	1820	165	0.0452	1365	80	0.0294	682	27	0.0198
16	2986	470	0.0788	2588	383	0.0741	2189	199	0.0455	1592	142	0.0445	1194	70	0.0294	597	24	0.0203
18	2654	421	0.0793	2300	345	0.0750	1946	177	0.0455	1415	126	0.0444	1062	60	0.0283	531	21	0.0200
20	2389	377	0.0788	2070	306	0.0738	1752	157	0.0449	1274	109	0.0428	955	60	0.0316	478	20	0.0206
22	2171	344	0.0792	1882	278	0.0740	1592	138	0.0432	1158	101	0.0435	869	50	0.0291	434	17	0.0193
24	1990	317	0.0795	1725	259	0.0750	1460	128	0.0439	1062	92	0.0433	796	50	0.0316	398	17	0.0208
25	1911	300	0.0786	1656	249	0.0751	1401	128	0.0458	1019	92	0.0451	764	40	0.0263	382	15	0.0196
30	1592	250	0.0787	1380	201	0.0729	1168	99	0.0424	849	76	0.0446	637	40	0.0317	318	15	0.0238

Max. cutting depth  
Maximale Schnitttiefe  
Profondità di taglio  
Profondeur de coupe

WX-G-EDSS	
D < Ø 1	0.10
Ø 1 ≤ D < Ø 3	0.30
Ø 3 ≤ D	0.50
FX-MG-EDS	
D ≤ Ø 6	0.30
Ø 6 < D	0.50

WX-G-EDSS	
D < Ø 1	0.020
Ø 1 ≤ D	0.050
FX-MG-EDS	
D ≤ Ø 6	0.10
Ø 6 < D	0.20

1. Use high precision machine set up to ensure maximum rigidity.
  2. In case of vibration, reduce both feed and speed.
  3. Use a coolant that has a low co-efficient of smoke emission.
- \* Modified parameters

1. Utilizzare una macchina ed un mandrino di elevata rigidità e di alta precisione.
  2. In caso di vibrazioni, ridurre simultaneamente la velocità di taglio e l'avanzamento.
  3. Utilizzare dei lubrificanti da taglio adeguati, dotati di un coefficiente elevato di rallentamento d'emissione del fumo.
- \* Parametro modificato

1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spanmittel.
  2. Falls Vibrationen auftreten sollten, Vorschub und Schnittgeschwindigkeit reduzieren.
  3. Kuhlmittel mit niedriger Rauchentwicklung verwenden.
- \* Modifizierten Parameters

1. Utilisez une machine et un porte-outil de grande rigidité et de haute précision.
  2. En cas de vibrations, réduisez, simultanément, la vitesse de coupe et l'avance.
  3. Utilisez des lubrifiants de coupe appropriés dotés d'un coef. élevé de ralentissement d'émission de fumée.
- \* Paramètres modifiés

## Conditions - Schnittwerte - Condizioni - Conditions

Side milling - Konturfräsen -  
Conturnatura - Contournage

WX-G-ETSS



Work material Werkstoff Materiale Matière à usiner	C0,2% - GG			SCM-SKD			SUS			30~38 HRC			45~55 HRC			55~60 HRC		
	E24·XC 48·GG25 750 N/mm			35NCD16·40CMD8 ~30 HRC			316·304 800 N/mm			Z38CDV5·Z40CDV5 38~45 HRC			Z38CDV5 45~55 HRC			Z160CDV12 55~60 HRC		
	100 (m/min)			80 (m/min)			60 (m/min)			150 (m/min)			150 (m/min)			100 (m/min)		
Ø	S. (min <sup>-1</sup> )	F. (mm/min)	AZ (mm)	S. (min <sup>-1</sup> )	F. (mm/min)	AZ (mm)	S. (min <sup>-1</sup> )	F. (mm/min)	AZ (mm)	S. (min <sup>-1</sup> )	F. (mm/min)	AZ (mm)	S. (min <sup>-1</sup> )	F. (mm/min)	AZ (mm)	S. (min <sup>-1</sup> )	F. (mm/min)	AZ (mm)
3	10.610	589	0.027	8.488	458	0.018	6.366	267	0.014	6.366	344	0.018	6.366	210	0.011	3.183	105	0.011
4	7.958	907	0.038	6.366	477	0.025	4.775	272	0.019	4.775	358	0.025	4.775	229	0.016	2.387	107	0.015
5	6.366	955	0.050	5.093	519	0.034	3.820	298	0.026	3.820	390	0.034	3.820	241	0.021	1.910	115	0.020
6	5.305	987	0.062	4.244	547	0.043	3.183	306	0.032	3.183	411	0.043	3.183	248	0.026	1.592	119	0.025
8	3.979	883	0.074	3.183	535	0.056	2.387	272	0.038	2.387	401	0.056	2.387	222	0.031	1.194	107	0.030
10	3.183	793	0.083	2.546	519	0.068	1.910	241	0.042	1.910	390	0.068	1.910	195	0.034	955	95	0.033
12	2.653	796	0.100	2.122	497	0.078	1.592	239	0.050	1.592	372	0.078	1.592	196	0.041	796	95	0.040
16	1.989	657	0.110	1.592	525	0.110	1.194	286	0.080	1.194	394	0.110	1.194	190	0.053	597	90	0.050

Max. cutting depth  
Maximale Schnitttiefe  
Profondità di taglio  
Profondeur de coupe

Ø < 6	a <sub>a</sub>	a <sub>r</sub>
6 ≤ Ø	1.50	0.020
Ø 6 ≤ Ø	1.50	0.050

a <sub>a</sub>	a <sub>r</sub>
1.50	0.020

a<sub>r</sub>Max=0.5mm

a <sub>a</sub>	a <sub>r</sub>
10	0.020

a<sub>r</sub>Max=0.5mm

Attention : sparks and/or flames can cause coolant fire. Be sure adequate fire prevention is available.

- Speeds and feeds are designed to be used in conjunction with small passes on a high speed & precision machine set-up.
- Do not use inflammable coolant. Using worn tools may generate sparks.
- Use compressed air or a high quality coolant with a low co-efficient of smoke emission.

Achtung: Funken und/oder Flammen können den Kühlschmierstoff entzünden, stellen Sie einen ausreichenden Brandschutz sicher.

- Die Schnittdaten sind ausgelegt für geringe Zustellungen in Verbindung mit HSC tauglichen Maschinen und Spanmittel.
- Bitte geeignetes Kühlmittel mit rauchhemmenden Zusätzen verwenden.
- Benutzen Sie Druckluft oder Kühlmittel mit rauchhemmenden Zusätzen.

Attenzione: le scintille prodotte durante l'operazione o il calore causato dalla rottura dell'utensile possono infiammare il lubrificante. Assicurarsi che siano applicate delle adeguate misure di prevenzione.

- Queste velocità e questi avanzamenti sono indicati per fresatura di piccole passate ad alta velocità e centri di lavorazione di alta precisione.
- Non utilizzare lubrificanti da taglio infiammabili; gli utensili troppo usurati possono produrre scintille.
- Utilizzare un getto di aria compressa. Se la vostra scelta ricade su dei liquidi da taglio, sceglierli di alta qualità, dotati di un coefficiente elevato di rallentamento d'emissione del fumo.

Attention : étincelles et/ou chaleur peuvent enflammer le lubrifiant. S'assurer que des mesures de prévention adéquates sont appliquées.

- Les vitesses et avances sont indiquées pour le fraisage de petites passes à haute vitesse / centres d'usinage de haute précision.
- Ne pas utiliser de lubrifiants de coupe inflammables, les outils fortement usés peuvent produire des étincelles.
- Utilisez un jet d'air comprimé ou des fluides de coupe de haute qualité avec un coef. élevé de ralentissement d'émission de fumée.

WX

## Slotting - Nutenfräsen -

## Per scanalature profonde - Rainurage

WX-G-ETSS

Work material Werkstoff Materiale Matière à usiner	C0,2% - GG			SCM-SKD			SUS			30~38 HRC			45~55 HRC			55~60 HRC		
	E24·XC 48·GG25 750 N/mm			35NCD16·40CMD8 ~30 HRC			316·304 800 N/mm			Z38CDV5·Z40CDV5 38~45 HRC			Z38CDV5 45~55 HRC			Z160CDV12 55~60 HRC		
	80 (m/min)			65 (m/min)			50 (m/min)			55 (m/min)			45 (m/min)			20 (m/min)		
Ø	S. (min <sup>-1</sup> )	F. (mm/min)	AZ (mm)	S. (min <sup>-1</sup> )	F. (mm/min)	AZ (mm)	S. (min <sup>-1</sup> )	F. (mm/min)	AZ (mm)	S. (min <sup>-1</sup> )	F. (mm/min)	AZ (mm)	S. (min <sup>-1</sup> )	F. (mm/min)	AZ (mm)	S. (min <sup>-1</sup> )	F. (mm/min)	AZ (mm)
3	8.488	688	0.027	6.897	372	0.018	5.305	223	0.014	5.836	245	0.014	4.775	158	0.011	2.122	70	0.011
4	6.366	726	0.038	5.173	388	0.025	3.979	227	0.019	4.377	249	0.019	3.581	172	0.016	1.592	72	0.015
5	5.093	764	0.050	4.138	422	0.034	3.183	248	0.026	3.501	273	0.026	2.865	180	0.021	1.273	76	0.020
6	4.244	789	0.062	3.448	445	0.043	2.653	255	0.032	2.918	280	0.032	2.387	186	0.026	1.061	80	0.025
8	3.183	707	0.074	2.586	434	0.056	1.989	233	0.039	2.188	256	0.039	1.790	167	0.031	796	72	0.030
10	2.546	672	0.088	2.069	422	0.068	1.592	224	0.047	1.751	247	0.047	1.432	146	0.034	637	63	0.033
12	2.122	637	0.100	1.724	403	0.078	1.326	215	0.054	1.459	236	0.054	1.194	147	0.041	531	64	0.040
16	1.592	573	0.120	1.293	388	0.100	995	239	0.080	1.094	263	0.080	895	142	0.053	398	60	0.050

Max. cutting depth  
Maximale Schnitttiefe  
Profondità di taglio  
Profondeur de coupe

a<sub>a</sub>=0.3D  
a<sub>a</sub>Max=3mm

## Conditions - Schnittwerte - Condizioni - Conditions



WX-EMS - WX-G-EMSS - FX-MG-EMS -  
FX-MG-EMSS - FX-SS-EMS

Side milling - Konturfräsen  
Sgrossatura e contornatura - Contournage

Work material Werkstoff Materiale Matière à usiner	GG		C≤0,2%		SCM - SKD		30~38 HRC		38~45 HRC - SUS		45~55 HRC - HRS		55~60 HRC	
	GG-GGG		S55C•SS400 ~750N/mm <sup>2</sup>		SKD•SKS•SNM ~30 HRC		NAK55•HPMI•SKT 30~38 HRC		SUS304• X210CR12• X40CRMOV51 38~45 HRC		45~55 HRC		55~60 HRC	
Ø	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
2	15.500	370	13.000	310	11.000	280	7.000	110	6.350	100	3.950	60	2.750	40
3	10.500	595	8.900	505	7.400	355	5.300	125	4.750	110	2.750	60	2.000	45
4	7.950	635	6.650	530	5.550	370	4.250	135	3.700	115	2.200	70	1.550	45
5	6.350	740	5.300	620	4.450	425	3.550	140	3.150	125	1.900	75	1.250	40
6	5.300	735	4.450	615	3.700	425	2.950	145	2.650	130	1.550	70	1.050	40
8	3.950	710	3.300	590	2.750	420	2.200	145	1.950	130	1.150	65	795	35
10	3.150	710	2.650	590	2.200	420	1.750	145	1.550	130	955	65	635	35
12	2.650	710	2.200	590	1.850	420	1.450	145	1.300	130	795	60	530	30
14	2.250	680	1.900	575	1.550	415	1.250	145	1.100	125	680	50	455	25
16	1.950	655	1.650	550	1.350	415	1.100	130	995	115	595	45	395	20
18	1.750	655	1.450	540	1.200	405	990	115	880	105	530	40	350	20
20	1.550	620	1.300	520	1.100	370	890	105	795	95	475	35	315	19
22	1.400	560	1.200	480	1.000	340	810	95	720	85	430	30	285	17
24	1.300	520	1.100	440	925	315	740	85	660	75	395	30	265	16
25	1.250	500	1.050	420	890	300	710	85	635	75	380	30	255	15
30	1.050	420	890	355	740	250	590	70	530	60	315	25	210	13

Max. cutting depth Maximale Schnittiefe Profondità di taglio Profondeur de coupe	WX-EMS - FX-MG-EMS - FX-SS-EMS			<table border="1"> <tr><td>a<sub>s</sub></td><td>a<sub>r</sub></td></tr> <tr><td>1.0</td><td>0.020</td></tr> </table>	a <sub>s</sub>	a <sub>r</sub>	1.0	0.020
	a <sub>s</sub>	a <sub>r</sub>						
	1.0	0.020						
	D < Ø 3		1.50	0.050				
Ø 3 ≤ D		1.50	0.10					
FX-MG-EMSS		a <sub>s</sub>	a <sub>r</sub>					
		1.20	0.010					
WX-G-EMSS		a <sub>s</sub>	a <sub>r</sub>					
		1.20	0.10					

a <sub>s</sub>	a <sub>r</sub>
1.0	0.020

WX-G-EMSS	
a <sub>s</sub>	a <sub>r</sub>
1.20	0.050

1. Use high precision machine set up to ensure maximum rigidity.
2. In case of vibration, reduce both feed and speed.
3. Use a coolant that has a low co-efficient of smoke emission.

1. Utilizzare una macchina ed un mandrino di elevata rigidità e di alta precisione.
2. In caso di vibrazioni, ridurre simultaneamente la velocità di taglio e l'avanzamento.
3. Utilizzare dei lubrificanti da taglio adeguati, dotati di un coefficiente elevato di rallentamento d'emissione del fumo.

1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spanmittel.
2. Falls Vibrationen auftreten sollten, Vorschub und Schnittgeschwindigkeit reduzieren.
3. Kuhlmittel mit niedriger Rauchentwicklung verwenden.

1. Utilisez une machine et un porte-outil de grande rigidité et de haute précision.
2. En cas de vibrations, réduisez, simultanément, la vitesse de coupe et l'avance.
3. Utilisez des lubrifiants de coupe appropriés dotés d'un coef. élevé de ralentissement d'émission de fumée.

## Conditions - Schnittwerte - Condizioni - Conditions

High speed side milling - HSC Konturfräsen

WX-EMS - WX-G-EMSS - FX-MG-EMS -

Fresatura alta velocità contornatura- Fraisage UGV contournage

FX-MG-EMSS - FX-SS-EMS



Work material Werkstoff Materiale Matière à usiner	C≤0,2% - GG		SCM - SKD		30~38 HRC		38~45 HRC		45~55 HRC	
	S. (min <sup>-1</sup> )	F. (mm/min)								
Ø										
6	21.000	2.450	18.500	2.150	13.000	1.500	7.950	795	4.200	420
8	15.500	2.450	13.500	2.100	9.900	1.450	5.950	795	3.150	425
10	12.500	2.500	11.000	2.100	7.950	1.450	4.750	800	2.500	420
12	10.500	2.450	9.250	2.100	6.600	1.450	3.950	790	2.100	410
14	9.050	2.350	7.950	2.000	5.650	1.350	3.400	740	1.800	390
16	7.950	2.250	6.950	1.950	4.950	1.350	2.950	715	1.550	375
18	7.050	2.250	6.150	1.900	4.400	1.300	2.650	705	1.400	375
20	6.350	2.100	5.550	1.850	3.950	1.300	2.350	665	1.250	355
22	5.750	1.950	5.050	1.700	3.600	1.200	2.150	635	1.150	325
24	5.300	1.800	4.600	1.550	3.300	1.100	1.950	575	1.050	295
25	5.050	1.700	4.450	1.500	3.150	1.050	1.900	560	1.000	280
30	4.200	1.400	3.700	1.250	2.650	890	1.550	455	845	240

Max. cutting depth Maximale Schnitttiefe Profondità di taglio Profondeur de coupe	WX-EMS - FX-MG-EMS - FX-SS-EMS			WX-EMS - FX-MG-EMS - FX-SS-EMS	
	D ≤ Ø 8	Ø 8 < D		a_s	a_r
	1.50	0.01D			
	1.50	0.03D			
	1.50	0.05D			
	FX-MG-EMSS		a_s	a_r	
	D ≤ Ø 8	1.20	0.01D		
	Ø 8 < D	1.20	0.02D		
	WX-G-EMSS		a_s	a_r	
	D < Ø 6	1.00	0.02D		
	Ø 6 ≤ D	1.00	0.05D		

Attention : sparks and/or flames can cause coolant fire. Be sure adequate fire prevention is available.

- Speeds and feeds are designed to be used in conjunction with small passes on a high speed & precision machine set-up.
- Do not use inflammable coolant. Using worn tools may generate sparks.
- Use compressed air or a high quality coolant with a low co-efficient of smoke emmission.

\* Modified parameters

Achtung: Funken und/oder Flammen können den Kühlschmierstoff entzünden. stellen Sie einen ausreichenden Brandschutz sicher.

- Die Schnittdaten sind ausgelegt für geringe Zustellungen in Verbindung mit HSC tauglichen Maschinen und Spanmittel.
- Bitte geeignetes Kühlmittel mit rauchhemmenden Zusätzen verwenden.
- Benutzen Sie Druckluft oder Kühlmittel mit rauchhemmenden Zusätzen.

\* Modifizierten Parametern

Attenzione: le scintille prodotto durante l'operazione o il calore causato dalla rottura dell'utensile possono infiammare il lubrificante. Assicurarsi che siano applicate delle adeguate misure di prevenzione.

- Queste velocità e questi avanzamenti sono indicati per fresatura di piccole passate ad alta velocità e centri di lavorazione di alta precisione.
- Non utilizzare lubrificanti da taglio infiammabili; gli utensili troppo usurati possono produrre scintille.
- Utilizzare un getto di aria compressa. Se la vostra scelta ricade su dei liquidi da taglio, sceglierli di alta qualità, dotati di un coefficiente elevato di rallentamento d'emissione del fumo.

\* Parametro modificato

Attention : étincelles et/ou chaleur peuvent enflammer le lubrifiant. S'assurer que des mesures de prévention adéquates sont appliquées.

- Les vitesses et avances sont indiquées pour le fraisage de petites passes à haute vitesse / centres d'usinage de haute précision.
- Ne pas utiliser de lubrifiants de coupe inflammables, les outils fortement usés peuvent produire des étincelles.
- Utilisez un jet d'air comprimé ou des fluides de coupe de haute qualité avec un coef. élevé de ralentissement d'émission de fumée.

\* Paramètres modifiés

WX  
FX

## Conditions - Schnittwerte - Condizioni - Conditions

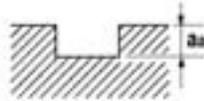


WX-PHS

High speed milling - HSC Schlichtfräsen -  
Fresatura alta velocità - Fraisage UGV

Work material Werkstoff Materiale Matière à usiner	C≤0,2% - GG SS400•S55C•FC250 ~750N/mm <sup>2</sup>		SCM - SKD SCM • SKT • SKS • SKD ~30 HRC		30~38 HRC SKT • SKD • NAK55 • HPM1 30~38 HRC		38~45 HRC - SUS SUS304• SKD 38~45 HRC		45~55 HRC - Tiall 45~55 HRC		55~60 HRC - HRS 55~60 HRC	
	100 (m/min)		78 (m/min)		66 (m/min)		62 (m/min)		60 (m/min)		30 (m/min)	
Ø	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
3	10.600	975	8.300	760	7.000	560	6.600	555	6.350	485	3.200	190
4	7.950	1.000	6.200	820	5.250	565	4.950	590	4.750	515	2.400	190
5	6.350	1.050	4.950	845	4.200	590	3.950	630	3.800	535	1.900	190
6	5.300	1.250	4.150	945	3.500	700	3.300	660	3.200	545	1.600	190
8	4.000	1.250	3.100	895	2.650	660	2.450	640	2.400	555	1.200	175
10	3.200	1.100	2.500	855	2.100	605	1.950	590	1.900	525	955	160
12	2.650	1.100	2.050	850	1.750	565	1.650	535	1.600	475	795	160
16	2.000	955	1.550	745	1.300	500	1.250	445	1.200	400	595	160
20	1.600	765	1.250	595	1.050	455	985	395	955	355	475	160

Max. cutting depth  
Maximale Schnitttiefe  
Profondità di taglio  
Profondeur de coupe



1. Use a rigid and precise machine and holder.
2. Please adjust the speed and feed when the cutting depth is large or when machines with low rigidity are used.
3. Please use a suitable fluid with high smoke retardant properties.
4. During dry (no fluid) milling, please use air blow to remove disposable chips from the milling area and to eliminate chip packing.

1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spanmittel.
2. Vorschub und Geschwindigkeit der Schnitttiefe und Maschinen-Starrheit anpassen.
3. Benutzen Sie Kühlmittel mit rauchhemenden Zusätzen.
4. Bei Trockenbearbeitung Druckluft zum Entfernen der Späne verwenden.

1. Usare un mandrino portautensile preciso e rigido/
2. Regolare la velocità e l'avanzamento se si aumenta la profondità di passata e se utilizza su macchine non rigide.
3. Si consiglia di usare emulsione a scarsa emissione di fumi.
4. Per fresatura a secco utilizzare aria.

1. Utiliser une machine et un attachement précis et rigide.
2. Ajuster la vitesse et l'avance en cas de profondeur de coupe importante ou en utilisant une machine non-rigide.
3. Utiliser un liquide de refroidissement adéquat.
4. En cas d'usinage à sec, utiliser de l'air comprimé pour l'évacuation des copeaux de l'aire d'usinage et pour éviter une agglomération des copeaux.

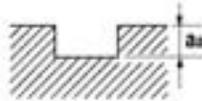
WX

WX-PHS

High speed milling - HSC Schlichtfräsen -  
Fresatura alta velocità - Fraisage UGV

Work material Werkstoff Materiale Matière à usiner	C≤0,2% - GG SS400•S55C•FC250 ~750N/mm <sup>2</sup>		SCM - SKD SCM • SKT • SKS • SKD ~30 HRC		30~38 HRC SKT • SKD • NAK55 • HPM1 30~38 HRC		38~45 HRC - SUS SUS304• SKD 38~45 HRC		45~55 HRC - Tiall 45~55 HRC		55~60 HRC - HRS 55~60 HRC	
	100 (m/min)		78 (m/min)		66 (m/min)		62 (m/min)		60 (m/min)		30 (m/min)	
Ø	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
3	10.600	975	8.300	760	7.000	560	6.600	555	6.350	485	3.200	190
4	7.950	1.000	6.200	820	5.250	565	4.950	590	4.750	515	2.400	190
5	6.350	1.050	4.950	845	4.200	590	3.950	630	3.800	535	1.900	190
6	5.300	1.250	4.150	945	3.500	700	3.300	660	3.200	545	1.600	190
8	4.000	1.250	3.100	895	2.650	660	2.450	640	2.400	555	1.200	175
10	3.200	1.100	2.500	855	2.100	605	1.950	590	1.900	525	955	160
12	2.650	1.100	2.050	850	1.750	565	1.650	535	1.600	475	795	160
16	2.000	955	1.550	745	1.300	500	1.250	445	1.200	400	595	160
20	1.600	765	1.250	595	1.050	455	985	395	955	355	475	160

Max. cutting depth  
Maximale Schnitttiefe  
Profondità di taglio  
Profondeur de coupe



1. Use a rigid and precise machine and holder.
2. Please adjust the speed and feed when the cutting depth is large or when machines with low rigidity are used.
3. Please use a suitable fluid with high smoke retardant properties.
4. During dry (no fluid) milling, please use air blow to remove disposable chips from the milling area and to eliminate chip packing.

1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spanmittel.
2. Vorschub und Geschwindigkeit der Schnitttiefe und Maschinen-Starrheit anpassen.
3. Benutzen Sie Kühlmittel mit rauchhemenden Zusätzen.
4. Bei Trockenbearbeitung Druckluft zum Entfernen der Späne verwenden.

1. Usare un mandrino portautensile preciso e rigido/
2. Regolare la velocità e l'avanzamento se si aumenta la profondità di passata e se utilizza su macchine non rigide.
3. Si consiglia di usare emulsione a scarsa emissione di fumi.
4. Per fresatura a secco utilizzare aria.

1. Utiliser une machine et un attachement précis et rigide.
2. Ajuster la vitesse et l'avance en cas de profondeur de coupe importante ou en utilisant une machine non-rigide.
3. Utiliser un liquide de refroidissement adéquat.
4. En cas d'usinage à sec, utiliser de l'air comprimé pour l'évacuation des copeaux de l'aire d'usinage et pour éviter une agglomération des copeaux.

## Conditions - Schnittwerte - Condizioni - Conditions

High speed milling - HSC Schlichtfräsen -  
Fresatura alta velocità - Fraisage UGV

WX-PHS



Work material Werkstoff Materiale Matière à usiner	C≤0,2% - GG SS400•S55C•FC250 ~750N/mm <sup>2</sup>		SCM - SKD SCM • SKT • SKS • SKD ~30 HRC		30~38 HRC SKT • SKD • NAK55 • HPM1 30~38 HRC		38~45 HRC - SUS SUS304• SKD 38~45 HRC	
	120 (m/min)		110 (m/min)		90~100 (m/min)		60~70 (m/min)	
Ø	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
3	12.700	1.050	10.600	935	9.550	745	6.350	460
4	9.550	1.150	7.950	1.000	7.150	745	5.150	560
5	7.650	1.200	7.000	1.100	6.350	865	4.150	595
6	6.350	1.550	5.850	1.150	5.300	910	3.700	670
8	4.750	1.450	4.400	1.300	4.000	985	2.800	690
10	3.800	1.400	3.500	1.200	3.200	865	2.250	635
12	3.200	1.250	2.900	1.150	2.650	815	1.850	595
16	2.400	1.050	2.200	965	2.000	675	1.400	500
20	1.900	840	1.750	770	1.600	635	1.100	445

Max. cutting depth  
Maximale Schnitttiefe  
Profondità di taglio  
Profondeur de coupe

1. Use a rigid and precise machine and holder.
2. Please adjust the speed and feed when the cutting depth is large or when machines with low rigidity are used.
3. Please use a suitable fluid with high smoke retardant properties.
4. During dry (no fluid) milling, please use air blow to remove disposable chips from the milling area and to eliminate chip packing.

1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spanmittel.
2. Vorschub und Geschwindigkeit der Schnitttiefe und Maschinen-Starrheit anpassen.
3. Benutzen Sie Kühlmittel mit rauchhemmenden Zusätzen.
4. Bei Trockenbearbeitung Druckluft zum Entfernen der Späne verwenden.

1. Usare un mandrino portautensile preciso e rigido/
2. Regolare la velocità e l'avanzamento se si aumenta la profondità di passata e se utilizzata su macchine non rigide.
3. Si consiglia di usare emulsione a scarsa emissione di fumi.
4. Per fresatura a secco utilizzare aria.

1. Utiliser une machine et un attachement précis et rigide.
2. Ajuster la vitesse et l'avance en cas de profondeur de coupe importante ou en utilisant un machine non-rigide.
3. Utiliser un liquide de refroidissement adéquat.
4. En cas d'usinage à sec, utiliser de l'air comprimé pour l'évacuation des copeaux de l'aire d'usinage et pour éviter une agglomération des copeaux.

WX

High speed milling - HSC Schlichtfräsen -  
Fresatura alta velocità - Fraisage UGV

WX-PHS

MatWork material Werkstoff Materiale Matière à usiner	C≤0,2% - GG SS400•S55C•FC250 ~750N/mm <sup>2</sup>		SCM - SKD SCM • SKT • SKS • SKD ~30 HRC		30~38 HRC SKT • SKD • NAK55 • HPM1 30~38 HRC		38~45 HRC - SUS SUS304• SKD 38~45 HRC		45~55 HRC - Tiall 45~55 HRC		55~60 HRC - HRS 55~60 HRC	
	200 (m/min)		200 (m/min)		200 (m/min)		150 (m/min)		100 (m/min)		80 (m/min)	
Ø	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
3	21.200	2.150	21.200	2.400	21.200	1.300	15.900	1.150	10.600	680	8.500	440
4	15.900	2.050	15.900	2.300	15.900	1.300	11.900	1.250	7.950	795	6.350	460
5	12.700	1.900	12.700	2.150	12.700	1.250	9.550	1.350	6.350	840	5.100	510
6	10.600	3.050	10.600	2.650	10.600	2.000	7.950	1.450	5.300	910	4.250	610
8	7.950	2.800	7.950	2.400	7.950	1.900	5.950	1.400	4.000	860	3.200	575
10	6.350	2.550	5.300	2.200	5.300	1.800	4.000	1.350	2.650	830	2.100	510
12	5.300	2.550	5.300	2.200	5.300	1.800	4.000	1.350	2.650	830	2.100	510
16	4.000	1.900	4.000	1.900	4.000	1.700	3.000	1.350	2.000	830	1.600	510
20	3.200	1.550	3.200	1.550	3.200	1.550	2.400	1.150	1.600	730	1.250	510

Max. cutting depth  
Maximale Schnitttiefe  
Profondità di taglio  
Profondeur de coupe

1. Use a rigid and precise machine and holder.
2. Please adjust the speed and feed when the cutting depth is large or when machines with low rigidity are used.
3. Please use a suitable fluid with high smoke retardant properties.
4. During dry (no fluid) milling, please use air blow to remove disposable chips from the milling area and to eliminate chip packing.

1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spanmittel.
2. Vorschub und Geschwindigkeit der Schnitttiefe und Maschinen-Starrheit anpassen.
3. Benutzen Sie Kühlmittel mit rauchhemmenden Zusätzen.
4. Bei Trockenbearbeitung Druckluft zum Entfernen der Späne verwenden.

1. Usare un mandrino portautensile preciso e rigido/
2. Regolare la velocità e l'avanzamento se si aumenta la profondità di passata e se utilizzata su macchine non rigide.
3. Si consiglia di usare emulsione a scarsa emissione di fumi.
4. Per fresatura a secco utilizzare aria.

1. Utiliser une machine et un attachement précis et rigide.
2. Ajuster la vitesse et l'avance en cas de profondeur de coupe importante ou en utilisant un machine non-rigide.
3. Utiliser un liquide de refroidissement adéquat.
4. En cas d'usinage à sec, utiliser de l'air comprimé pour l'évacuation des copeaux de l'aire d'usinage et pour éviter une agglomération des copeaux.

Conditions - Schnittwerte - Condizioni - Conditions

WX-LN-EDS - FX-LN-EDS-6

High speed milling - HSC Schlichtfräsen - Fresatura alta velocità - Fraisage UGV



Material Werkstoff Materiale Matière	C≤0,2% - GG				SCM - SKD				30~38 HRC				38~45 HRC - SUS				45~55 HRC				55~60 HRC																											
	E24•XC48•FT25 750 N/mm <sup>2</sup>								35NCD16•40CMD8 30 HRC								35NCD16 30~38 HRC								35NCD16 38~45 HRC								Z38CDV5 45~55 HRC								Z160CDV12 55~60 HRC							
	120 (m/min)				110 (m/min)				100 (m/min)				100 (m/min)				70 (m/min)				50 (m/min)																											
Ø	L utile (mm)	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)	aa (mm)	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)	aa (mm)	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)	aa (mm)	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)	aa (mm)	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)	aa (mm)	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)	aa (mm)																							
1.6	20	23.885	1.338	0.028	0.020	21.895	1.104	0.025	0.018	19.904	892	0.022	0.015	19.904	892	0.022	0.012	13.933	585	0.021	0.008	9.952	334	0.017	0.004																							
1.8	6	21.231	1.316	0.031	0.230	19.462	1.086	0.028	0.207	17.693	878	0.025	0.173	17.693	878	0.025	0.138	12.385	576	0.023	0.095	8.846	329	0.019	0.046																							
1.8	8	21.231	1.316	0.031	0.220	19.462	1.086	0.028	0.198	17.693	878	0.025	0.165	17.693	878	0.025	0.132	12.385	576	0.023	0.091	8.846	329	0.019	0.044																							
1.8	10	21.231	1.316	0.031	0.130	19.462	1.086	0.028	0.117	17.693	878	0.025	0.098	17.693	878	0.025	0.078	12.385	576	0.023	0.054	8.846	329	0.019	0.026																							
1.8	12	21.231	1.316	0.031	0.110	19.462	1.086	0.028	0.099	17.693	878	0.025	0.083	17.693	878	0.025	0.066	12.385	576	0.023	0.045	8.846	329	0.019	0.022																							
1.8	14	21.231	1.316	0.031	0.080	19.462	1.086	0.028	0.072	17.693	878	0.025	0.060	17.693	878	0.025	0.048	12.385	576	0.023	0.033	8.846	329	0.019	0.016																							
1.8	16	21.231	1.316	0.031	0.070	19.462	1.086	0.028	0.063	17.693	878	0.025	0.053	17.693	878	0.025	0.042	12.385	576	0.023	0.029	8.846	329	0.019	0.014																							
1.8	18	21.231	1.316	0.031	0.060	19.462	1.086	0.028	0.054	17.693	878	0.025	0.045	17.693	878	0.025	0.036	12.385	576	0.023	0.025	8.846	329	0.019	0.012																							
1.8	20	21.231	1.316	0.031	0.050	19.462	1.086	0.028	0.045	17.693	878	0.025	0.038	17.693	878	0.025	0.030	12.385	576	0.023	0.021	8.846	329	0.019	0.010																							
2	6	19.108	1.299	0.034	0.340	17.516	1.072	0.031	0.306	15.924	866	0.027	0.255	15.924	866	0.027	0.204	11.146	568	0.026	0.140	7.962	325	0.020	0.068																							
2	8	19.108	1.299	0.034	0.290	17.516	1.072	0.031	0.261	15.924	866	0.027	0.218	15.924	866	0.027	0.174	11.146	568	0.026	0.119	7.962	325	0.020	0.058																							
2	10	19.108	1.299	0.034	0.260	17.516	1.072	0.031	0.234	15.924	866	0.027	0.195	15.924	866	0.027	0.156	11.146	568	0.026	0.107	7.962	325	0.020	0.052																							
2	12	19.108	1.299	0.034	0.140	17.516	1.072	0.031	0.126	15.924	866	0.027	0.105	15.924	866	0.027	0.084	11.146	568	0.026	0.058	7.962	325	0.020	0.028																							
2	14	19.108	1.299	0.034	0.100	17.516	1.072	0.031	0.090	15.924	866	0.027	0.075	15.924	866	0.027	0.060	11.146	568	0.026	0.041	7.962	325	0.020	0.020																							
2	16	19.108	1.299	0.034	0.090	17.516	1.072	0.031	0.081	15.924	866	0.027	0.068	15.924	866	0.027	0.054	11.146	568	0.026	0.037	7.962	325	0.020	0.018																							
2	18	19.108	1.299	0.034	0.080	17.516	1.072	0.031	0.072	15.924	866	0.027	0.060	15.924	866	0.027	0.048	11.146	568	0.026	0.033	7.962	325	0.020	0.016																							
2	20	19.108	1.299	0.034	0.070	17.516	1.072	0.031	0.063	15.924	866	0.027	0.053	15.924	866	0.027	0.042	11.146	568	0.026	0.029	7.962	325	0.020	0.014																							
2	25	19.108	1.299	0.034	0.030	17.516	1.072	0.031	0.027	15.924	866	0.027	0.023	15.924	866	0.027	0.018	11.146	568	0.026	0.012	7.962	325	0.020	0.006																							
2	30	19.108	1.299	0.034	0.020	17.516	1.072	0.031	0.018	15.924	866	0.027	0.015	15.924	866	0.027	0.012	11.146	568	0.026	0.008	7.962	325	0.020	0.004																							
2.5	8	15.287	1.834	0.060	0.420	14.013	1.513	0.054	0.378	12.739	1.223	0.048	0.315	12.739	1.223	0.048	0.252	8.917	803	0.045	0.173	6.369	459	0.036	0.084																							
2.5	10	15.287	1.834	0.060	0.360	14.013	1.513	0.054	0.324	12.739	1.223	0.048	0.270	12.739	1.223	0.048	0.216	8.917	803	0.045	0.148	6.369	459	0.036	0.072																							
2.5	12	15.287	1.834	0.060	0.240	14.013	1.513	0.054	0.216	12.739	1.223	0.048	0.180	12.739	1.223	0.048	0.144	8.917	803	0.045	0.099	6.369	459	0.036	0.048																							
2.5	14	15.287	1.834	0.060	0.180	14.013	1.513	0.054	0.162	12.739	1.223	0.048	0.135	12.739	1.223	0.048	0.108	8.917	803	0.045	0.074	6.369	459	0.036	0.036																							
2.5	16	15.287	1.834	0.060	0.130	14.013	1.513	0.054	0.117	12.739	1.223	0.048	0.098	12.739	1.223	0.048	0.078	8.917	803	0.045	0.054	6.369	459	0.036	0.026																							
2.5	18	15.287	1.834	0.060	0.110	14.013	1.513	0.054	0.099	12.739	1.223	0.048	0.083	12.739	1.223	0.048	0.066	8.917	803	0.045	0.045	6.369	459	0.036	0.022																							
2.5	20	15.287	1.834	0.060	0.100	14.013	1.513	0.054	0.090	12.739	1.223	0.048	0.075	12.739	1.223	0.048	0.060	8.917	803	0.045	0.041	6.369	459	0.036	0.020																							
2.5	25	15.287	1.834	0.060	0.080	14.013	1.513	0.054	0.072	12.739	1.223	0.048	0.060	12.739	1.223	0.048	0.048	8.917	803	0.045	0.033	6.369	459	0.036	0.016																							
2.5	30	15.287	1.834	0.060	0.030	14.013	1.513	0.054	0.027	12.739	1.223	0.048	0.023	12.739	1.223	0.048	0.018	8.917	803	0.045	0.012	6.369	459	0.036	0.006																							
3	8	12.739	2.038	0.080	0.390	11.677	1.682	0.072	0.351	10.616	1.359	0.064	0.293	10.616	1.359	0.064	0.234	7.431	892	0.060	0.161	5.308	510	0.048	0.078																							
3	10	12.739	2.038	0.080	0.310	11.677	1.682	0.072	0.279	10.616	1.359	0.064	0.233	10.616	1.359	0.064	0.186	7.431	892	0.060	0.128	5.308	510	0.048	0.062																							
3	12	12.739	2.038	0.080	0.290	11.677	1.682	0.072	0.261	10.616	1.359	0.064	0.218	10.616	1.359	0.064	0.174	7.431	892	0.060	0.119	5.308	510	0.048	0.058																							
3	14	12.739	2.038	0.080	0.270	11.677	1.682	0.072	0.243	10.616	1.359	0.064	0.203	10.616	1.359	0.064	0.162	7.431	892	0.060	0.111	5.308	510	0.048	0.054																							
3	16	12.739	2.038	0.080	0.220	11.677	1.682	0.072	0.198	10.616	1.359	0.064	0.165	10.616	1.359	0.064	0.132	7.431	892	0.060	0.091	5.308	510	0.048	0.044																							
3	18	12.739	2.038	0.080	0.160	11.677	1.682	0.072	0.144	10.616	1.359	0.064	0.120	10.616	1.359	0.064	0.096	7.431	892	0.060	0.066	5.308	510	0.048	0.032																							
3	20	12.739	2.038	0.080	0.140	11.677	1.682	0.072	0.126	10.616	1.359	0.064	0.105	10.616	1.359	0.064	0.084	7.431	892	0.060	0.058	5.308	510	0.048	0.028																							
3	25	12.739	2.038	0.080	0.130	11.677	1.682	0.072	0.117	10.616	1.359	0.064	0.098	10.616	1.359	0.064	0.078	7.431	892	0.060	0.054	5.308	510	0.048	0.026																							
3	30	12.739	2.038	0.080	0.100	11.677	1.682	0.072	0.090	10.616	1.359	0.064	0.075	10.616	1.359	0.064	0.060	7.431	892	0.060	0.041	5.308	510	0.048	0.020																							
3	35	12.739	2.038	0.080	0.080	11.677	1.682	0.072	0.072	10.616	1.359	0.064	0.060	10.616	1.359	0.064	0.048	7.431	892	0.060	0.033	5.308	510	0.048	0.016																							
3	40	12.739	2.038	0.080	0.040	11.677	1.682	0.072	0.036	10.616	1.359	0.064	0.030	10.616	1.359	0.064	0.024	7.431	892	0.060	0.016	5.308	510	0.048	0.008																							
4	12	9.554	1.911	0.100	0.420	8.758	1.576	0.090	0.378	7.962	1.274	0.080	0.315	7.962	1.274	0.080	0.252	5.573	836	0.075	0.173	3.981	478	0.060	0.084																							
4	16	9.554	1.911	0.100	0.390	8.758	1.576	0.090	0.351	7.962	1.274	0.080	0.293	7.962	1.274	0.080	0.234	5.573	836	0.075	0.161	3.981	478	0.060	0.078																							
4	20	9.554	1.911	0.100	0.360	8.758	1.576	0.090	0.324	7.962	1.274	0.080	0.270	7.962	1.274	0.080	0.216	5.573	836	0.075	0.148	3.981	478	0.060	0.072																							
4	25	9.554	1.720	0.090	0.290	8.758	1.419	0.081	0.261	7.962	1.146	0.072	0.218	7.962	1.146	0.072	0.174	5.573	752	0.068	0.119	3.981	430	0.054	0.058																							
4	30	9.554	1.529	0.080	0.210	8.758	1.261	0.072	0.189	7.962	1.019	0.064	0.158	7.962	1.019	0.064	0.126	5.573	669	0.060	0.086	3.981	382	0.048	0.042																							
4	35	9.554	1.																																													

Conditions - Schnittwerte - Condizioni - Conditions

High speed milling - HSC Schlichtfräsen -  
Fresatura alta velocità - Fraisage UGV

WX-LN-EDS - FX-LN-EDS-6



Material Werkstoff Matière	C≤0,2%				SCM - SKD				30~38 HRC				38~45 HRC - SUS				45~55 HRC				55~60 HRC				
	E24·XC48·FT25 750 N/mm <sup>2</sup>				35NCD16·40CMD8 30 HRC				35NCD16 30~38 HRC				35NCD16 38~45 HRC				Z38CDV5 45~55 HRC				Z160CDV12 55~60 HRC				
	120 (m/min)				110 (m/min)				100 (m/min)				100 (m/min)				70 (m/min)				50 (m/min)				
Ø	Lg (mm)	S. (min <sup>-1</sup> )	F. (mm/min)	AZ (mm)	aa (mm)	S. (min <sup>-1</sup> )	F. (mm/min)	AZ (mm)	aa (mm)	S. (min <sup>-1</sup> )	F. (mm/min)	AZ (mm)	aa (mm)	S. (min <sup>-1</sup> )	F. (mm/min)	AZ (mm)	aa (mm)	S. (min <sup>-1</sup> )	F. (mm/min)	AZ (mm)	aa (mm)	S. (min <sup>-1</sup> )	F. (mm/min)	AZ (mm)	aa (mm)
0.2	0.5	50.000	600	0.006	0.020	50.000	540	0.005	0.018	50.000	480	0.005	0.015	50.000	480	0.005	0.012	50.000	450	0.005	0.008	50.000	360	0.004	0.004
0.2	1	50.000	450	0.005	0.014	50.000	405	0.004	0.013	50.000	360	0.004	0.011	50.000	360	0.004	0.008	50.000	338	0.003	0.006	50.000	270	0.003	0.003
0.2	1.5	50.000	300	0.003	0.009	50.000	270	0.003	0.008	50.000	240	0.002	0.007	50.000	240	0.002	0.005	50.000	225	0.002	0.004	50.000	180	0.002	0.002
0.3	1	50.000	600	0.006	0.029	50.000	540	0.005	0.026	50.000	480	0.005	0.022	50.000	480	0.005	0.017	50.000	450	0.005	0.012	50.000	360	0.004	0.006
0.3	2	50.000	600	0.006	0.021	50.000	540	0.005	0.019	50.000	480	0.005	0.016	50.000	480	0.005	0.013	50.000	450	0.005	0.009	50.000	360	0.004	0.004
0.3	3	50.000	500	0.005	0.010	50.000	450	0.005	0.009	50.000	400	0.004	0.008	50.000	400	0.004	0.006	50.000	375	0.004	0.004	50.000	300	0.003	0.002
0.4	2	50.000	700	0.007	0.029	50.000	630	0.006	0.026	50.000	560	0.006	0.022	50.000	560	0.006	0.017	40.000	420	0.005	0.012	40.000	336	0.004	0.006
0.4	3	50.000	600	0.006	0.018	50.000	540	0.005	0.016	50.000	480	0.005	0.014	50.000	480	0.005	0.011	40.000	360	0.005	0.007	40.000	288	0.004	0.004
0.4	4	50.000	600	0.006	0.013	50.000	540	0.005	0.012	50.000	480	0.005	0.010	50.000	480	0.005	0.008	40.000	360	0.005	0.005	39.809	287	0.004	0.003
0.5	2	50.000	900	0.009	0.049	50.000	810	0.008	0.044	40.000	576	0.007	0.037	40.000	576	0.007	0.029	40.000	540	0.007	0.020	31.847	344	0.005	0.010
0.5	4	50.000	900	0.009	0.023	50.000	810	0.008	0.021	40.000	576	0.007	0.017	40.000	576	0.007	0.014	40.000	540	0.007	0.009	31.847	344	0.005	0.005
0.5	6	50.000	900	0.009	0.007	40.000	648	0.008	0.006	40.000	576	0.007	0.005	40.000	576	0.007	0.004	40.000	540	0.007	0.003	31.847	344	0.005	0.001
0.5	8	50.000	800	0.008	0.005	40.000	576	0.007	0.005	40.000	512	0.006	0.004	40.000	512	0.006	0.003	40.000	480	0.006	0.002	31.847	306	0.005	0.001
0.6	2	40.000	800	0.010	0.059	40.000	720	0.009	0.053	40.000	640	0.008	0.044	40.000	640	0.008	0.035	37.155	557	0.008	0.024	26.539	318	0.006	0.012
0.6	4	40.000	800	0.010	0.043	40.000	720	0.009	0.039	40.000	640	0.008	0.032	40.000	640	0.008	0.026	37.155	557	0.008	0.018	26.539	318	0.006	0.009
0.6	6	40.000	720	0.009	0.020	40.000	648	0.008	0.018	40.000	576	0.007	0.015	40.000	576	0.007	0.012	37.155	502	0.007	0.008	26.539	287	0.005	0.004
0.6	8	40.000	720	0.009	0.008	40.000	648	0.008	0.007	40.000	576	0.007	0.006	40.000	576	0.007	0.005	37.155	502	0.007	0.003	26.539	287	0.005	0.002
0.6	10	40.000	640	0.008	0.005	40.000	576	0.007	0.005	40.000	512	0.006	0.004	40.000	512	0.006	0.003	37.155	446	0.006	0.002	26.539	255	0.005	0.001
0.7	2	40.000	960	0.012	0.068	40.000	864	0.011	0.061	40.000	768	0.010	0.051	40.000	768	0.010	0.041	31.847	573	0.009	0.028	22.748	328	0.007	0.014
0.7	4	40.000	800	0.010	0.050	40.000	720	0.009	0.045	40.000	640	0.008	0.038	40.000	640	0.008	0.030	31.847	478	0.008	0.021	22.748	273	0.006	0.010
0.7	6	40.000	800	0.010	0.032	40.000	720	0.009	0.029	40.000	640	0.008	0.024	40.000	640	0.008	0.019	31.847	478	0.008	0.013	22.748	273	0.006	0.006
0.7	8	40.000	720	0.009	0.018	40.000	648	0.008	0.016	40.000	576	0.007	0.014	40.000	576	0.007	0.011	31.847	430	0.007	0.007	22.748	246	0.005	0.004
0.7	10	40.000	720	0.009	0.009	40.000	648	0.008	0.008	40.000	576	0.007	0.007	40.000	576	0.007	0.005	31.847	430	0.007	0.004	22.748	246	0.005	0.002
0.8	4	40.000	1.120	0.014	0.057	40.000	1.008	0.013	0.051	39.809	892	0.011	0.043	39.809	892	0.011	0.034	27.866	585	0.011	0.023	19.904	334	0.008	0.011
0.8	6	40.000	1.120	0.014	0.036	40.000	1.008	0.013	0.032	39.809	892	0.011	0.027	39.809	892	0.011	0.022	27.866	585	0.011	0.015	19.904	334	0.008	0.007
0.8	8	40.000	1.120	0.014	0.026	40.000	1.008	0.013	0.023	39.809	892	0.011	0.020	39.809	892	0.011	0.016	27.866	585	0.011	0.011	19.904	334	0.008	0.005
0.8	10	40.000	960	0.012	0.010	40.000	864	0.011	0.009	39.809	764	0.010	0.008	39.809	764	0.010	0.006	27.866	502	0.009	0.004	19.904	287	0.007	0.002
0.8	12	40.000	960	0.012	0.007	40.000	864	0.011	0.006	39.809	764	0.010	0.005	39.809	764	0.010	0.004	27.866	502	0.009	0.003	19.904	287	0.007	0.001
0.9	6	40.000	1.280	0.016	0.064	38.924	1121	0.014	0.058	35.386	906	0.013	0.048	35.386	906	0.013	0.038	24.770	594	0.012	0.026	17.693	340	0.010	0.013
0.9	8	40.000	1.280	0.016	0.041	38.924	1121	0.014	0.037	35.386	906	0.013	0.031	35.386	906	0.013	0.025	24.770	594	0.012	0.017	17.693	340	0.010	0.008
0.9	10	40.000	1.280	0.016	0.029	38.924	1121	0.014	0.026	35.386	906	0.013	0.022	35.386	906	0.013	0.017	24.770	594	0.012	0.012	17.693	340	0.010	0.006
0.9	15	40.000	1.120	0.014	0.007	38.924	981	0.013	0.006	35.386	793	0.011	0.005	35.386	793	0.011	0.004	24.770	520	0.011	0.003	17.693	297	0.008	0.001
1	6	38.217	1.376	0.018	0.070	35.032	1.135	0.016	0.063	31.847	917	0.014	0.053	31.847	917	0.014	0.042	22.293	602	0.014	0.029	15.924	344	0.011	0.014
1	8	38.217	1.376	0.018	0.050	35.032	1.135	0.016	0.045	31.847	917	0.014	0.038	31.847	917	0.014	0.030	22.293	602	0.014	0.021	15.924	344	0.011	0.010
1	10	38.217	1.376	0.018	0.030	35.032	1.135	0.016	0.027	31.847	917	0.014	0.023	31.847	917	0.014	0.018	22.293	602	0.014	0.012	15.924	344	0.011	0.006
1	12	38.217	1.376	0.018	0.020	35.032	1.135	0.016	0.018	31.847	917	0.014	0.015	31.847	917	0.014	0.012	22.293	602	0.014	0.008	15.924	344	0.011	0.004
1	14	38.217	1.223	0.016	0.015	35.032	1.009	0.014	0.014	31.847	815	0.013	0.011	31.847	815	0.013	0.009	22.293	535	0.012	0.006	15.924	306	0.010	0.003
1	16	38.217	1.223	0.016	0.010	35.032	1.009	0.014	0.009	31.847	815	0.013	0.008	31.847	815	0.013	0.006	22.293	535	0.012	0.004	15.924	306	0.010	0.002
1.2	6	31.847	1.338	0.021	0.090	29.193	1.104	0.019	0.081	26.539	892	0.017	0.068	26.539	892	0.017	0.054	18.577	585	0.016	0.037	13.270	334	0.013	0.018
1.2	8	31.847	1.338	0.021	0.070	29.193	1.104	0.019	0.063	26.539	892	0.017	0.053	26.539	892	0.017	0.042	18.577	585	0.016	0.029	13.270	334	0.013	0.014
1.2	10	31.847	1.338	0.021	0.060	29.193	1.104	0.019	0.054	26.539	892	0.017	0.040	26.539	892	0.017	0.036	18.577	585	0.016	0.025	13.270	334	0.013	0.012
1.2	12	31.847	1.338	0.021	0.040	29.193	1.104	0.019	0.036	26.539	892	0.017	0.030	26.539	892	0.017	0.024	18.577	585	0.016	0.016	13.270	334	0.013	0.008
1.4	6	27.298	1.310	0.024	0.140	25.023	1.081	0.022	0.126	22.748	874	0.019	0.105	22.748	874	0.019	0.084	15.924	573	0.018	0.058	11.374	328	0.014	0.028
1.4	8	27.298	1.310	0.024	0.100	25.023	1.081	0.022	0.090	22.748	874	0.019	0.075	22.748	874	0.019	0.060	15.924	573	0.018	0.041	11.374	328	0.014	0.020
1.4	10	27.298	1.310	0.024	0.070	25.023	1.081	0.022	0.063	22.748	874	0.01													

## Conditions - Schnittwerte - Condizioni - Conditions

## WX-EBD - FX-MG-EBD - FX-LS-MG-EBD - FX-SS-EBD

Work material Werkstoff Materiale Matière à usiner	GG		C≤0,2%		SCM - SKD		30~38 HRC		38~45 HRC - SUS		45~55 HRC - HRS		55~60 HRC														
	GG-GGG		S55C•SS400 ~750N/mm <sup>2</sup>		SKD•SKS•SNCM ~30 HRC		NAK55•HPMI•SKT 30~38 HRC		SUS304• X210CR12• X40CRM0V51 38~45 HRC		45~55 HRC		55~60 HRC														
Ø	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)													
R 0.2 X 0.4	32.000	460	32.000	460	32.000	410	32.000	330	32.000	205	24.500	135	24.500	115													
R 0.3 X 0.6	32.000	535	32.000	535	31.500	490	32.000	420	32.000	265	24.500	175	23.500	150													
R 0.5 X 1	32.000	765	32.000	765	31.500	620	25.000	400	22.000	285	19.000	210	14.000	140													
R 1 X 2	23.500	940	19.000	765	15.500	620	12.500	400	11.000	290	9.500	210	7.150	140													
R 1.5 X 3	15.500	940	12.500	765	10.500	630	8.450	405	7.400	290	6.350	210	4.750	140													
R 2 X 4	11.500	940	9.500	765	7.950	630	6.350	445	5.550	370	4.750	270	3.550	175													
R 2.5 X 5	9.500	1.050	7.600	855	6.350	635	5.050	445	4.450	370	3.800	285	2.850	175													
R 3 X 6	7.950	1.050	6.350	855	5.300	670	4.200	465	3.700	390	3.150	295	2.350	185													
R 4 X 8	5.950	1.300	4.750	1.050	3.950	790	3.150	555	2.750	455	2.350	325	1.750	210													
R 5 X 10	4.750	1.200	3.800	960	3.150	745	2.500	525	2.200	430	1.900	335	1.400	210													
R 6 X 12	3.950	1.100	3.150	890	2.650	700	2.100	490	1.850	430	1.550	310	1.150	195													
R 7 X 14	3.400	1.050	2.700	865	2.250	675	1.800	475	1.550	390	1.350	300	1.000	190													
R 8 X 16	2.950	1.050	2.350	840	1.950	645	1.550	475	1.350	380	1.150	270	895	185													
R 9 X 18	2.650	1.000	2.100	795	1.750	610	1.400	475	1.200	380	1.050	260	795	175													
R 10 X 20	2.350	940	1.900	765	1.550	570	1.250	450	1.100	370	955	250	715	170													
R 12.5 X 25	1.900	760	1.500	670	1.250	465	1.000	360	890	295	760	210	570	145													
R 15 X 30	1.550	650	1.250	630	1.050	435	845	310	740	250	635	175	475	115													
Max. cutting depth Maximale Schnitttiefe Profondità di taglio Profondeur de coupe	<table border="1"> <tr><td>aa</td><td>ar</td></tr> <tr><td>1.2D</td><td>0.01D</td></tr> <tr><td colspan="2">WX-EBD</td></tr> <tr><td>R ≤ 0.5</td><td>0.05D 0.2D</td></tr> <tr><td>0.5 ≤ R</td><td>0.1D 0.2D</td></tr> </table>  <table border="1"> <tr><td>aa</td><td>pf</td></tr> <tr><td>0.05D</td><td>0.1D</td></tr> </table>											aa	ar	1.2D	0.01D	WX-EBD		R ≤ 0.5	0.05D 0.2D	0.5 ≤ R	0.1D 0.2D	aa	pf	0.05D	0.1D		
aa	ar																										
1.2D	0.01D																										
WX-EBD																											
R ≤ 0.5	0.05D 0.2D																										
0.5 ≤ R	0.1D 0.2D																										
aa	pf																										
0.05D	0.1D																										

1. Use a rigid and precise machine and holder.
2. Please use a suitable fluid with high smoke retardant properties.

1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spannmittel.
2. Benutzen Sie Kühlmittel mit rauchhemmenden Zusätzen.

1. Usare un mandrino portautensile preciso e rigido/
2. Si consiglia di usare emulsione a scarsa emissione di fumi.

1. Utiliser une machine et un attachement précis et rigide.
2. Utiliser un liquide de refroidissement adéquat.

## Conditions - Schnittwerte - Condizioni - Conditions

High speed milling - HSC Schlichtfräsen -  
Fresatura alta velocità - Fraisage UGV

WX-EBD - FX-MG-EBD



Work material Werkstoff Materiale Matière à usiner	C≤0,2% - GG S55C+SS400+GG25 ~750N/mm <sup>2</sup>		SCM - SKD SKD+SKS+SNCM ~30 HRC		30~38 HRC NAK55+HPMI+SKT 30~38 HRC		38~45 HRC - SUS SUS304+ X210CR12+ X40CRMV51 38~45 HRC		45~55 HRC - HRS 45~55 HRC		55~60 HRC 55~60 HRC	
	350~500 (m/min)		300~450 (m/min)		250~400 (m/min)		150~300 (m/min)		120~220 (m/min)		80~150 (m/min)	
Ø	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
R 0.5 X 1	50.000	2.800	50.000	2.800	50.000	2.500	47.500	2.250	32.000	1.450	25.000	1.000
R 1 X 2	31.500	3.500	25.000	2.800	24.500	2.500	23.500	2.250	17.000	1.550	12.500	1.000
R 1.5 X 3	21.000	3.500	16.500	2.800	16.000	2.500	15.500	2.250	11.000	1.550	8.450	1.000
R 2 X 4	18.000	3.700	15.500	3.400	15.000	2.750	13.500	2.450	11.000	1.900	7.950	1.100
R 2.5 X 5	15.500	4.000	15.000	4.050	14.000	2.900	11.000	2.300	10.000	2.100	7.600	1.200
R 3 X 6	15.000	4.800	13.500	4.300	11.500	2.750	9.500	2.250	9.500	2.250	6.600	1.150
R 4 X 8	11.500	3.650	10.000	3.200	8.950	2.100	7.150	1.700	7.150	1.700	4.950	890
R 5 X 10	9.500	3.000	8.250	2.600	7.150	1.700	5.700	1.350	5.700	1.350	3.950	710
R 6 X 12	7.950	2.500	6.850	2.150	5.950	1.400	4.750	1.100	4.750	1.100	3.300	590
R 7 X 14	6.800	2.150	5.900	1.850	5.100	1.200	4.050	970	4.050	970	2.800	500
R 8 X 16	5.950	1.900	5.150	1.600	4.450	1.050	3.550	850	3.550	850	2.450	440
R 9 X 18	5.300	1.650	4.550	1.450	3.950	945	3.150	755	3.150	755	2.200	395
R 10 X 20	4.750	1.500	4.100	1.300	3.550	850	2.850	680	2.850	680	1.950	350
R 12.5 X 25	3.800	1.200	3.300	1.050	2.850	680	2.250	540	2.250	540	1.550	275
R 15 X 30	3.150	1.000	2.750	880	2.350	560	1.900	455	1.900	455	1.300	230

Max. cutting depth Maximale Schnitttiefe Profondità di taglio Profondeur de coupe	R ≤ 12.5	aa	pf
	12.5 < R	0.02D	0.05D
	WX-EBD	aa	pf
		0.02D	0.05D

R ≤ 12.5	aa	pf
12.5 < R	0.02D	0.05D

Attention : sparks and/or flames can cause coolant fire. Be sure adequate fire prevention is available.

- Speeds and feeds are designed to be used in conjunction with small passes on a high speed & precision machine set-up.
- Do not use inflammable coolant. Using worn tools may generate sparks.
- Use compressed air or a high quality coolant with a low co-efficient of smoke emission.

Achtung: Funken und/oder Flammen können den Kühlschmierstoff entzünden. stellen Sie einen ausreichenden Brandschutz sicher.

- Die Schnittdaten sind ausgelegt für geringe Zustellungen in Verbindung mit HSC tauglichen Maschinen und Spanmitteln.
- Bitte geeignetes Kühlmittel mit rauchhemmenden Zusätzen verwenden.
- Benutzen Sie Druckluft oder Kühlmittel mit rauchhemmenden Zusätzen..

Attenzione: le scintille prodotte durante l'operazione o il calore causato dalla rottura dell'utensile possono infiammare il lubrificante. Assicurarsi che siano applicate delle adeguate misure di prevenzione.

- Queste velocità e questi avanzamenti sono indicati per fresatura di piccole passate ad alta velocità e centri di lavorazione di alta precisione.
- Non utilizzare lubrificanti da taglio infiammabili; gli utensili troppo usurati possono produrre scintille.
- Utilizzare un getto di aria compressa. Se la vostra scelta ricade su dei liquidi da taglio, sceglierli di alta qualità, dotati di un coefficiente elevato di rallentamento d'emissione del fumo.

Attention : étincelles et/ou chaleur peuvent enflammer le lubrifiant. S'assurer que des mesures de prévention adéquates sont appliquées.

- Les vitesses et avances sont indiquées pour le fraisage de petites passes à haute vitesse / centres d'usinage de haute précision.
- Ne pas utiliser de lubrifiants de coupe inflammables, les outils fortement usés peuvent produire des étincelles.
- Utilisez un jet d'air comprimé ou des fluides de coupe de haute qualité avec un coef. éle-

WX  
FX

## Conditions - Schnittwerte - Condizioni - Conditions

## WX-HS-CRE - WX-CRE

High speed milling - HSC Schlichtfräsen -  
Fresatura alta velocità - Fraisage UGV

Work material Werkstoff Materiale Matière à usiner	GG		30~38 HRC SKT•SKD•NAK55•HPM1 30~38 HRC		38~45 HRC - SUS SUS304•SKD•NAK80• HPM50 38~45 HRC		45~55 HRC 45~55 HRC		55~60 HRC 55~60 HRC	
	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
Ø										
2 X R0.5	31.850	10.500	32.000	9.550	24.000	7.150	24.000	6.450	16.000	2.850
3 X R0.75	21.000	12.500	21.000	12.000	16.000	8.400	16.000	7.850	10.500	3.300
4 X R1	16.000	13.000	16.000	12.000	12.000	9.000	12.000	8.200	7.950	3.550
5 X R1.2	12.500	14.000	12.500	12.500	9.550	9.550	9.550	8.600	6.350	3.800
6 X R1.5	10.600	14.000	10.600	12.700	7.950	9.550	7.950	8.600	5.300	3.800
7 X R1.5	9.100	12.000	9.100	10.900	6.800	8.200	6.800	7.350	4.550	3.250
8 X R2	7.950	14.000	7.950	12.700	5.950	9.550	5.950	8.600	4.000	3.800
9 X R2	7.050	12.400	7.050	11.300	5.300	8.500	5.300	7.650	3.550	3.400
10 X R2	6.350	14.000	6.350	12.700	4.750	9.550	4.750	8.600	3.200	3.800
11 X R2	5.800	12.700	5.800	11.600	4.350	8.700	4.350	7.800	2.900	3.500
12 X R3	5.300	14.000	5.300	12.700	4.000	9.550	4.000	8.600	2.650	3.800
13 X R3	4.900	12.900	4.900	11.800	3.650	8.800	3.650	7.950	2.450	3.550

Max. cutting depth Maximale Schnitttiefe Profondità di taglio Profondeur de coupe			
	$0.1 \times R$	0.3D	$R \leq 2$ $2 < R$
	$0.1 \times R$	0.3D	$0.2 \text{ mm}$
	$0.05 \times R$	0.3D	0.3D
	0.1 mm	0.3D	0.3D

Attention : sparks and/or flames can cause coolant fire. Be sure adequate fire prevention is available.

- Use a rigid and precise machine and holder.
- These milling conditions are based on milling with circular interpolation at corners. For milling without circular interpolation (such as right angle corners), reduce the speed to 50-70% and the cutting depth to 50-80% of the above conditions.
- We suggest using air blow or MQL (mist).
- Please adjust the speed, feed and cutting depth according to actual cutting conditions.
- When WX-CRE enters in Z axis, reduce the feed speed to 30-60% of the above conditions with machining incline angle  $\beta \leq 2^\circ$ .
- These milling conditions are for a tool extension length : less than 4 x D. For a longer tool extension, reduce the speed, feed rate, and the cutting depth in accordance with the respective coefficients, to prevent chattering.

Achtung: Funken und/oder Flammen können den Kühlschmierstoff entzünden. Stellen sie einen ausreichenden Brandschutz sicher.

- Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spannmittel.
- Diese Schnittdaten basieren auf Fräsen mit zirkularer Ecken Interpolation. Bei Bearbeitungen ohne, reduzieren Sie den Vorschub auf 50-70 %, die Schnitttiefe auf 50-80 % der oben genannten Schnittdaten.
- Wir empfehlen Luft- oder Minimalmengen Kühlung.
- Bitte regulieren Sie Schnittgeschwindigkeit, Vorschub und Spanntiefe entsprechend Ihrer aktuellen Zerspanungsbedingungen.
- Wenn in der Z-Achse gearbeitet wird, muß der Vorschub auf 30-50 % reduziert werden. Neigungswinkel  $(\beta) \leq 2^\circ$ .
- Die Schnittwerte sind für eine max. Auskraglänge von 4xD. Bei größeren Auskraglängen müssen Schnittgeschwindigkeit, Vorschub und Schnitttiefe zur Vermeidung von Vibrationen mit den jeweiligen Koeffizienten verändert werden.

Attenzione: le scintille prodotte durante l'operazione o il calore causato dalla rottura dell'utensile possono infiammare il lubrificante. Assicurarsi che siano applicate delle adeguate misure di prevenzione.

- Utilizzare una macchina ed un mandrino di elevata rigidità e di alta precisione.
- Queste condizioni di fresatura si riferiscono a un'interpolazione circolare. Per una fresatura senza interpolazione circolare ridurre la velocità al 50-70 % e la profondità di taglio al 50-80 % rispetto alle condizioni sopra esposte.
- Suggeriamo l'utilizzo di aria compressa o lubrificazione minima (misto olio).
- Regolare l'avanzamento e la profondità di taglio secondo le attuali condizioni di taglio.
- Quando la FXS-CRE entra nell'asse Z ridurre l'avanzamento al 30-60 % con un'inclinazione dell'angolo  $(\beta) \leq 2^\circ$ .
- Queste condizioni di fresatura sono da intendersi per una sporgenza dell'utensile dal mandrino inferiore a 4 x diametro. Per sporgenze maggiori ridurre l'avanzamento.

Attention: étincelles et/ou chaleur peuvent enflammer le lubrifiant. S'assurer que des mesures de prévention adéquate sont appliquées

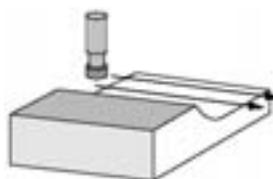
- Utiliser une machine et un porte-outil de grande rigidité et de haute précision.
- Les conditions de coupe sont basées sur du fraisage en interpolation circulaire des angles. Pour l'usinage sans interpolation circulaire (angle droit), réduire la vitesse de 50 à 70% et la profondeur des passes de 50 à 80%.
- Utiliser de l'arrosage en brouillard (mist).
- Ajuster la vitesse, avances et la profondeur de coupe.
- Quand WX-CRE entre en mouvement axe Z, réduire avance de 30 à 60% pour l'usinage des angle incliné  $\beta \leq 2^\circ$ .
- Les conditions de coupe sont applicable pour des outils avec un lg. < 4 x D. Pour des outils plus longues réduire vitesse, avances et profondeur de coupe pour éviter bourrage.

(%) Tool extension coefficients - (%) Werkzeug Ausspann Koeffizient - Coefficients lg outil %

Overhang Length Ausspannlänge Lunghezza Longueur	Cutting Speed Schnittgeschwindigkeit Velocità Vitesses	ap aa aa	Feed Vorschub Avanzamento Avance
L/D ≤ 4	100	100	100
L/D = 5	60~80	60~80	70~90
L/D = 6	40~60	40~60	60~80

## Ultra-high speed conditions - Ultra HSC-Konditionen - Conditions Ultra UGV - Condizioni di altissima velocità

- When milling flat areas with a stable load, the speed and the feed rate of the high-speed conditions can be further increased to 150 - 200%.
- The ultra-high speed conditions are for a tool extension length : less than 4 x D. If the tool extension length is over 4 x D, do not refer to it.
- Für das Fräsen von geraden Bereichen mit gleichmäßiger Belastung kann die Schnittgeschwindigkeit und der Vorschub gegenüber den angegebenen HSC - Schnittdaten auf 150-200% erhöht werden.
- Die ultra HSC Konditionen sind ausschließlich für eine Ausspannlänge, kleiner als 4D geeignet.



- In caso di fresatura di un'area piatta con un carico stabile, la velocità e l'avanzamento in condizioni di alta velocità possono essere ulteriormente aumentati a 150-200%.
- Le condizioni di altissima velocità si riferiscono ad una lunghezza estendibile dell'utensile inferiore a 4xD. Se l'estensione dell'utensile è superiore a 4xD non bisogna farvi riferimento.
- Pour du fraisage des surfaces planes avec une charge stable les avances peuvent être augmentées de 150 à 200%
- Ces conditions de fraisage ultra UGV sont applicables pour des longueurs d'outils inférieur à 4 x D. Pour des longueurs d'outils supérieur à 4 x D ces conditions ne sont pas applicables

Conditions - Schnittwerte - Condizioni - Conditions

WX-HS-CRE - WX-CRE



Work material Werkstoff Materiale Matière à usiner	GG		30~38 HRC SKT•SKD•NAK55•HPM1 30~38 HRC		38~45 HRC - SUS SUS304•SKD•NAK80• HPM50 38~45 HRC		45~55 HRC 45~55 HRC		55~60 HRC 55~60 HRC	
	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
Ø										
2 X R0.5	16.000	5.250	12.500	3.800	11.000	3.350	7.950	2.150	4.750	860
3 X R0.75	10.500	6.250	8.500	4.500	7.450	3.900	5.300	2.600	3.200	995
4 X R1	7.950	6.600	6.350	4.800	5.550	4.200	4.000	2.750	2.400	1.050
5 X R1.2	6.350	7.000	5.100	5.100	4.450	4.450	3.200	2.850	1.900	1.150
6 X R1.5	5.300	7.000	4.250	5.100	3.700	4.450	2.650	2.850	1.600	1.150
7 X R1.5	4.550	6.000	3.650	4.350	3.200	3.800	2.250	2.450	1.350	980
8 X R2	4.000	7.000	3.200	5.100	2.800	4.450	2.000	2.850	1.200	1.150
9 X R2	3.550	6.200	2.850	4.550	2.500	3.950	1.750	2.550	1.050	1.000
10 X R2	3.200	7.000	2.550	5.100	2.250	4.450	1.600	2.850	955	1.150
11 X R2	2.900	6.350	2.300	4.650	2.050	4.050	1.450	2.600	870	1.050
12 X R3	2.650	7.000	2.100	5.100	1.850	4.450	1.350	2.850	795	1.150
13 X R3	2.450	6.450	1.950	4.700	1.700	4.100	1.200	2.650	735	1.050

Max. cutting depth Maximale Schnitttiefe Profondità di taglio Profondeur de coupe			
	$0.1 \times R$	$0.3D$	$0.3D$
	$R \leq 2$	$0.1 \times R$	$0.3D$
	$2 < R$	$0.2 \text{ mm}$	$0.3D$

Attention : sparks and/or flames can cause coolant fire. Be sure adequate fire prevention is available.

1. Use a rigid and precise machine and holder.
2. These milling conditions are based on milling with circular interpolation at corners. For milling without circular interpolation (such as right angle corners), reduce the speed to 50-70% and the cutting depth to 50-80% of the above conditions.
3. We suggest using air blow or MQL (mist).
4. Please adjust the speed, feed and cutting depth according to actual cutting conditions.
5. When WX-CRE enters in Z axis, reduce the feed speed to 30-60% of the above conditions with machining incline angle  $\beta \leq 2^\circ$ .
6. These milling conditions are for a tool extension length : less than 4 x D. For a longer tool extension, reduce the speed, feed rate, and the cutting depth in accordance with the respective coefficients, to prevent chattering.

Achtung: Funken und/oder Flammen können den Kühlschmierstoff entzünden. Stellen sie ein ausreichenden Brandschutz sicher.

1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spannmittel.
2. Diese Schnittdaten basieren auf Fräsen mit circularer Ecken Interpolation. Bei Bearbeitungen ohne, reduzieren Sie den Vorschub auf 50-70 %, die Schnitttiefe auf 50-80 % der oben genannten Schnittdaten.
3. Wir empfehlen Luft- oder Minimalmengen Kühlung.
4. Bitte regulieren Sie Schnittgeschwindigkeit, Vorschub und Spanntiefe entsprechend Ihrer aktuellen Zerspanungsbedingungen.
5. Wenn in der Z-Achse gearbeitet wird, muß der Vorschub auf 30-50 % reduziert werden. Neigungswinkel ( $\beta$ )  $\leq 2^\circ$ .
6. Die Schnittwerte sind für eine max. Auskräglänge von 4xD. Bei größeren Auskräglängen müssen Schnittgeschwindigkeit, Vorschub und Schnitttiefe zur Vermeidung von Vibrationen mit den jeweiligen Koeffizienten verändert werden.

Attenzione: le scintille prodotte durante l'operazione o il calore causato dalla rottura dell'utensile possono infiammare il lubrificante. Assicurarsi che siano applicate delle adeguate misure di prevenzione.

1. Utilizzare una macchina ed un mandrino di elevata rigidità e di alta precisione.
2. Queste condizioni di fresatura si riferiscono a un'interpolazione circolare. Per una fresatura senza interpolazione circolare ridurre la velocità al 50-70 % e la profondità di taglio al 50-80 % rispetto alle condizioni sopra esposte.
3. Sugeriamo l'utilizzo di aria compressa o lubrificazione minimale (misto olio).
4. Regolare l'avanzamento e la profondità di taglio secondo le attuali condizioni di taglio.
5. Quando la FXS-CRE entra nell'asse Z ridurre l'avanzamento al 30-60 % con un'inclinazione dell'angolo ( $\beta$ )  $\leq 2^\circ$ .
6. Queste condizioni di fresatura sono da intendersi per una sporgenza dell'utensile dal mandrino inferiore a 4 x diametro. Per sporgenze maggiori ridurre l'avanzamento.

Attention: étincelles et/ou chaleur peuvent enflammer le lubrifiant. S'assurer que des mesures de prévention adéquate sont appliquées

1. Utiliser une machine et un porte-outil de grande rigidité et de haute précision.
2. Les conditions de coupe sont basées sur du fraisage en interpolation circulaire des angles. Pour l'usinage sans interpolation circulaire (angle droit), réduire la vitesse de 50 à 70% et la profondeur des passes de 50 à 80%.
3. Utiliser de l'arrosage en brouillard (mist).
4. Ajuster le vitesse, avances et la profondeur de coupe.
5. Quand WX-CRE entre en mouvement axe Z, réduire avance de 30 à 60% pour l'usinage des angle incliné  $\beta \leq 2^\circ$ .
6. Les conditions de coupe sont applicable pour des outils avec un lg. < 4 x D. Pour des outils plus longues réduire vitesse, avances et profondeur de coupe pour éviter bourrage.

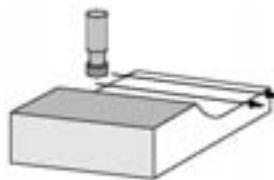
WX

(%)Tool extension coefficients - (%) Werkzeug Ausspann Koeffizient - Coefficients lg outil %

Overhang Length Ausspannlänge Lunghezza Longueur	Cutting Speed Schnittgeschwindigkeit Velocità Vitesse	ap aa aa	Feed Vorschub Avanzamento Avance
L/D ≤ 4	100	100	100
L/D = 5	60~80	60~80	70~90
L/D = 6	40~60	40~60	60~80

Ultra-high speed conditions - Ultra HSC-Konditionen - Conditions Ultra UGV - Condizioni di altissima velocità

- When milling flat areas with a stable load, the speed and the feed rate of the high-speed conditions can be further increased to 150 - 200%.
- The ultra-high speed conditions are for a tool extension length : less than 4 x D. If the tool extension length is over 4 x D, do not refer to it.
- Für das Fräsen von geraden Bereichen mit gleichmäßiger Belastung kann die Schnittgeschwindigkeit und der Vorschub gegenüber den angegebenen HSC - Schnittdaten auf 150-200% erhöht werden.
- Die ultra HSC Konditionen sind ausschließlich für eine Ausspannlänge, kleiner als 4D geeignet.



- In caso di fresatura di un'area piatta con un carico stabile, la velocità e l'avanzamento in condizioni di alta velocità possono essere ulteriormente aumentati a 150-200%
- Le condizioni di altissima velocità si riferiscono ad una lunghezza estendibile dell'utensile inferiore a 4xD. Se l'estensione dell'utensile è superiore a 4xD non bisogna farvi riferimento.
- Pour du fraisage des surfaces planes avec une charge stable les avances peuvent être augmentées de 150 à 200%
- Ces conditions de fraisage ultra UGV sont applicables pour des longueur d'outils inférieur à 4 x D. Pour des longueur d'outils supérieur à 4 x D ces conditions ne sont pas applicables

## Conditions - Schnittwerte - Condizioni - Conditions

min

WX-CR-PHS

High speed milling - HSC Schlichtfräsen -  
Fresatura alta velocità - Fraisage UGV

Work material Werkstoff Materiale Matière à usiner	C≤0.2% - GG SS400•S55C•FC250 ~750N/mm <sup>2</sup>		SCM - SKD SCM•SKT•SKS•SKD ~30 HRC		30~38 HRC SKT•SKD•NAK55•HPM1 30~38 HRC		38~45 HRC - SUS SUS304•SKD•NAK80• HPM50 38~45 HRC		45~55 HRC 45~55 HRC		55~60 HRC 55~60 HRC	
	100 (mMmin)		80 (mMmin)		70 (mMmin)		60 (mMmin)		60 (mMmin)		30 (mMmin)	
Ø	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
3	10.610	976	8.488	781	7.427	594	6.366	509	6.366	458	3.183	191
4	7.958	1.019	6.366	815	5.570	597	4.775	477	4.775	477	2.987	191
5	6.366	1.044	5.093	832	4.456	606	3.820	489	3.820	489	1.910	199
6	5.305	1.252	4.244	1.002	3.714	713	3.183	586	3.183	586	1.592	210
8	3.979	1.257	3.183	1.006	2.785	668	2.387	544	2.387	544	1.194	181
10	3.183	1.108	2.546	886	2.228	624	1.910	512	1.910	512	955	172
12	2.653	1.061	2.122	849	1.857	743	1.592	554	1.592	477	796	169
16	1.989	915	1.592	732	1.393	641	1.194	454	1.194	430	597	167
20	1.592	764	1.273	611	1.114	535	955	420	955	382	477	166
Max. cutting depth Maximale Schnitttiefe Profondità di taglio Profondeur de coupe	aa = 0.5D						aa = 0.05D					

1. Use high precision machine set up to ensure maximum rigidity.
2. When chattering occurs, reduce the speed and feed simultaneously.
3. Use a coolant that has a low co-efficient of smoke emission.

1. Utilizzare una macchina e un mandrino di elevata rigidità e di alta precisione.
2. In caso di vibrazione, ridurre simultaneamente la velocità di taglio e l'avanzamento.
3. Utilizzare dei lubrificanti di taglio adeguati, dotati di un elevato coefficiente di rallentamento di emissione del fumo.

1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spanmittel.
2. Falls Vibrationen auftreten sollten, Vorschub und Schnittgeschwindigkeit reduzieren.
3. Bitte geeignetes Kühlmedium mit rauchhemmenden Zusätzen verwenden.

1. Utilisez une machine et un porte-outil de grande rigidité et de haute précision.
2. En cas de vibrations, réduisez, simultanément, la vitesse de coupe et l'avance.
3. Utilisez des lubrifiants de coupe adéquats, dotés d'un coef. élevé de ralentissement d'émission de fumée.

WX

WX-CR-PHS

High speed milling - HSC Schlichtfräsen -  
Fresatura alta velocità - Fraisage UGV

Work material Werkstoff Materiale Matière à usiner	C≤0.2% - GG SS400•S55C•FC250 ~750N/mm <sup>2</sup>		SCM - SKD SCM•SKT•SKS•SKD ~30 HRC		30~38 HRC SKT•SKD•NAK55•HPM1 30~38 HRC		38~45 HRC - SUS SUS304•SKD•NAK80• HPM50 38~45 HRC		45~55 HRC 45~55 HRC		55~60 HRC 55~60 HRC	
	80 (mMmin)		60 (mMmin)		55 (mMmin)		52 (mMmin)		42 (mMmin)		20 (mMmin)	
Ø	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
3	8.488	781	6.366	586	5.836	490	5.517	463	4.456	374	2.122	110
4	6.366	891	4.775	668	4.377	490	4.138	463	3.342	374	1.592	127
5	5.093	876	3.820	657	3.501	490	3.310	463	2.674	374	1.273	127
6	4.244	849	3.183	637	2.918	490	2.759	463	2.674	374	1.273	127
8	3.183	764	2.387	573	2.188	455	2.069	430	1.671	348	796	127
10	2.546	713	1.910	535	1.751	420	1.655	397	1.337	321	637	127
12	2.122	637	1.592	477	1.459	438	1.379	414	1.114	334	531	117
16	1.592	637	1.194	477	1.094	394	1.035	414	836	334	398	95
20	1.273	560	955	420	875	385	828	364	668	321	318	89
Max. cutting depth Maximale Schnitttiefe Profondità di taglio Profondeur de coupe	aa = 0.5D						aa = 0.05D					

1. Use high precision machine set up to ensure maximum rigidity.
2. When chattering occurs, reduce the speed and feed simultaneously.
3. Use a coolant that has a low co-efficient of smoke emission.

1. Utilizzare una macchina e un mandrino di elevata rigidità e di alta precisione.
2. In caso di vibrazione, ridurre simultaneamente la velocità di taglio e l'avanzamento.
3. Utilizzare dei lubrificanti di taglio adeguati, dotati di un elevato coefficiente di rallentamento di emissione del fumo.

1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spanmittel.
2. Falls Vibrationen auftreten sollten, Vorschub und Schnittgeschwindigkeit reduzieren.
3. Bitte geeignetes Kühlmedium mit rauchhemmenden Zusätzen verwenden.

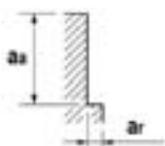
1. Utilisez une machine et un porte-outil de grande rigidité et de haute précision.
2. En cas de vibrations, réduisez, simultanément, la vitesse de coupe et l'avance.
3. Utilisez des lubrifiants de coupe adéquats, dotés d'un coef. élevé de ralentissement d'émission de fumée.

## Conditions - Schnittwerte - Condizioni - Conditions

High speed milling - HSC Schlichtfräsen -  
Fresatura alta velocità - Fraisage UGV

FXS-EMS - FXS-EMSS - FXS-CR-EMS



Work material Werkstoff Materiale Matière à usiner	C≤0,2% - GG S55C-SS400 ~750N/mm <sup>2</sup>		SCM - SKD SKD-SKS-SNCM ~30 HRC		30~38 HRC NAK55-HPMI-SKT 30~38 HRC		38~45 HRC - SUS SUS304- X210CR12- X40CRMOV51 38~45 HRC		45~55 HRC - HRS 45~55 HRC		55~60 HRC 55~60 HRC										
	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)									
Ø	47.500	6.250	42.000	5.350	31.500	2.650	26.500	1.650	15.500	830	12.500	590									
3	35.500	6.250	31.500	5.750	23.500	3.350	19.500	1.650	11.500	960	9.500	595									
4	28.500	6.700	25.000	6.000	19.000	3.600	15.500	1.650	9.500	995	7.600	595									
5	23.500	4.400	21.000	3.750	15.500	2.800	13.000	2.000	7.950	1.200	6.350	960									
6	17.500	4.300	15.500	3.750	11.500	2.800	9.900	2.050	5.950	1.250	4.750	955									
8	14.000	4.250	12.500	3.750	9.500	2.800	7.950	2.100	4.750	1.250	3.800	955									
10	11.500	3.950	10.500	3.500	7.950	2.600	6.600	1.950	3.950	1.150	3.150	875									
12	10.000	3.750	9.050	3.350	6.800	2.500	5.650	1.750	3.400	1.050	2.700	795									
14	8.950	3.500	7.950	3.100	5.950	2.300	4.950	1.600	2.950	970	2.350	740									
16	7.950	3.100	7.050	2.750	5.300	2.050	4.400	1.450	2.650	885	2.100	690									
18	7.150	2.800	6.350	2.500	4.750	1.850	3.950	1.350	2.350	785	1.900	625									
20	5.700	2.350	5.050	2.100	3.800	1.500	3.150	1.100	1.900	675	1.500	525									
25	4.750	1.950	4.200	1.750	3.150	1.250	2.650	940	1.550	550	1.250	435									
30	<div style="display: flex; align-items: center;"> <div style="margin-right: 20px;"> <p>Max. cutting depth Maximale Schnitttiefe Profondità di taglio Profondeur de coupe</p> <table border="1"> <thead> <tr> <th></th> <th>aa</th> <th>ar</th> </tr> </thead> <tbody> <tr> <td>D ≤ Ø 12</td> <td>10</td> <td>0.010</td> </tr> <tr> <td>Ø 12 &lt; D</td> <td>10</td> <td>0.020</td> </tr> </tbody> </table> </div>  </div>													aa	ar	D ≤ Ø 12	10	0.010	Ø 12 < D	10	0.020
	aa	ar																			
D ≤ Ø 12	10	0.010																			
Ø 12 < D	10	0.020																			

Attention : sparks and/or flames can cause coolant fire. Be sure adequate fire prevention is available.

1. Speeds and feeds are designed to be used in conjunction with small passes on a high speed & precision machine set-up.
2. Do not use inflammable coolant. Using worn tools may generate sparks.
3. Use compressed air or a high quality coolant with a low co-efficient of smoke emission.

Achtung: Funken und/oder Flammen können den Kühlschmierstoff entzünden. stellen Sie einen ausreichenden Brandschutz sicher.

1. Die Schnittdaten sind ausgelegt für geringe Zustellungen in Verbindung mit HSC tauglichen Maschinen und Spanmitteln.
2. Bitte geeignetes Kühlmittel mit rauchhemmenden Zusätzen verwenden.
3. Benutzen Sie Druckluft oder Kühlmittel mit rauchhemmenden Zusätzen.

Attenzione: le scintille prodotte durante l'operazione o il calore causato dalla rottura dell'utensile possono infiammare il lubrificante. Assicurarsi che siano applicate delle adeguate misure di prevenzione.

1. Queste velocità e questi avanzamenti sono indicati per fresatura di piccole passate ad alta velocità e centri di lavorazione di alta precisione.
2. Non utilizzare lubrificanti da taglio infiammabili; gli utensili troppo usurati possono produrre scintille.
3. Utilizzare un getto di aria compressa. Se la vostra scelta ricade su dei liquidi da taglio, sceglierli di alta qualità, dotati di un coefficiente elevato di rallentamento d'emissione del fumo.

Attention : étincelles et/ou chaleur peuvent enflammer le lubrifiant. S'assurer que des mesures de prévention adéquates sont appliquées.

1. Les vitesses et avances sont indiquées pour le fraisage de petites passes à haute vitesse / centres d'usinage de haute précision.
2. Ne pas utiliser de lubrifiants de coupe inflammables, les outils fortement usés peuvent produire des étincelles.
3. Utilisez un jet d'air comprimé ou des fluides de coupe de haute qualité avec un coef. éle-

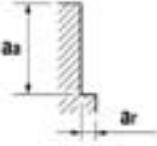
FXS

## Conditions - Schnittwerte - Condizioni - Conditions



FXS-HPE

Side milling - Konturfräsen -  
Conturnatura - Contournage

Work material Werkstoff Materiale Matière à usiner	C≤0,2% - GG		SCM - SKD		30~38 HRC		38~45 HRC - SUS		45~55 HRC - HRS		55~60 HRC	
	S55C-SS400 ~750N/mm <sup>2</sup>		SKD-SKS-SNCRM ~30 HRC		NAK55-HPMI-SKT 30~38 HRC		SUS304- X210CR12- X40CRMOV51 38~45 HRC		45~55 HRC		55~60 HRC	
	100 (m/min)		75 (m/min)		65 (m/min)		40 (m/min)		35 (m/min)		25 (m/min)	
Ø	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
10	3.150	760	2.400	680	2.100	310	1.300	165	1.100	115	760	55
12	2.650	730	2.000	620	1.750	285	1.100	145	955	105	635	45
14	2.250	675	1.700	550	1.500	245	955	125	815	95	545	40
18	1.750	580	1.300	440	1.150	195	740	100	635	85	420	35
22	1.450	520	1.080	360	940	170	580	100	500	85	360	35
Max. cutting depth Maximale Schnitttiefe Profondità di taglio Profondeur de coupe	$a_a = 1.2D$ $a_r = 0.1D$				$a_a = 1.2D$ $a_r = 0.05D$		$a_a = 1.2D$ $a_r = 0.05D$		$a_a = 1.2D$ $a_r = 0.05D$		$a_a = 1.2D$ $a_r = 0.05D$	

1. Use high precision machine set up to ensure maximum rigidity.
2. When chattering occurs, reduce the speed and feed simultaneously.
3. Use a coolant that has a low co-efficient of smoke emission.

1. Utilizzare una macchina e un mandrino di elevata rigidità e di alta precisione.
2. In caso di vibrazione, ridurre simultaneamente la velocità di taglio e l'avanzamento.
3. Utilizzare dei lubrificanti di taglio adeguati, dotati di un elevato coefficiente di rallentamento di emissione del fumo.

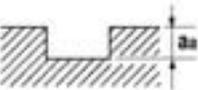
1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spannmittel.
2. Falls Vibrationen auftreten sollten, Vorschub und Schnittgeschwindigkeit reduzieren.
3. Bitte geeignetes Kühlmedium mit rauchhemmenden Zusätzen verwenden.

1. Utilisez une machine et un porte-outil de grande rigidité et de haute précision.
2. En cas de vibrations, réduisez, simultanément, la vitesse de coupe et l'avance.
3. Utilisez des lubrifiants de coupe adéquats, dotés d'un coef. élevé de ralentissement d'émission de fumée.

FXS

FXS-HPE

Slotting - Nutenfräsen -  
Per scanalature profonde - Rainurage

Work material Werkstoff Materiale Matière à usiner	C≤0,2% - GG		SCM - SKD		30~38 HRC		38~45 HRC - SUS		45~55 HRC - HRS		55~60 HRC	
	S55C-SS400 ~750N/mm <sup>2</sup>		SKD-SKS-SNCRM ~30 HRC		NAK55-HPMI-SKT 30~38 HRC		SUS304- X210CR12- X40CRMOV51 38~45 HRC		45~55 HRC		55~60 HRC	
	100 (m/min)		75 (m/min)		65 (m/min)		40 (m/min)		35 (m/min)		25 (m/min)	
Ø	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
10	2.650	630	2.000	475	1.750	325	1.100	115	955	75	635	35
12	2.200	590	1.650	440	1.450	300	955	110	795	75	530	35
14	1.900	560	1.400	445	1.250	270	815	95	680	70	455	30
18	1.450	480	1.100	365	990	225	635	80	530	60	350	25
22	1.150	410	860	310	790	180	500	65	430	50	290	25
Max. cutting depth Maximale Schnitttiefe Profondità di taglio Profondeur de coupe	$a_a = 0.5D$				$a_a = 0.1D$		$a_a = 0.1D$		$a_a = 0.1D$		$a_a = 0.05D$	

1. Conditions to be used if slant is = 3 x dia.  
  
If length is 5 x dia, than reduce feed and rotation by 40 to 50% and use 1/2 of depth of passes.  
If length is 6 x dia, than reduce feed and rotation by 60 to 70% and use 1/2 of depth of passes.
2. Adjust feed en rotation in function of depth of passes or machine rigidity.
3. Use compressed air or a high quality coolant with a low co-efficient of smoke emmision.

1. Condizioni da utilizzare se la lunghezza dell'estensione dell'utensile è uguale a 3 volte il diametro.  
Se la lunghezza è di 5 volte il diametro ridurre l'avanzamento e la rotazione dal 40 al 50% ed utilizzate 1/2 della profondità di passata.  
Se la lunghezza è di 6 volte il diametro ridurre l'avanzamento e la rotazione dal 60 al 70% ed utilizzate 1/2 della profondità di passata.
2. Regolare l'avanzamento e la velocità in funzione di taglio o della rigidità della macchina.
3. Utilizzare un getto di aria compressa. Se la vostra scelta ricade su dei liquidi da taglio, sceglierli di alta qualità, dotati di un coefficiente elevato di rallentamento di emissione del fumo.

1. Die angegebenen Schnittdaten sind für eine max. Ausspanlänge von 3 x D.  
Bei 5 x D die Schnittgeschwindigkeit und den Vorschub um 40 bis 50% reduzieren, die Schnitttiefe auf ein 1/2 reduzieren.  
Bei 6 x D die Schnittgeschwindigkeit und den Vorschub um 60 bis 70% reduzieren, die Schnitttiefe auf ein 1/2 reduzieren.
2. Vorschub und Geschwindigkeit der Schnitttiefe und Maschine-Starrheit anpassen.
3. Benutzen Sie Druckluft oder Kühlmittel mit rauchhemmenden Zusätzen.

1. Conditions à utiliser si le porte-à-faux est = à 3 x le dia.  
Si la longueur est de 5 x le dia, veuillez réduire l'avance et la rotation de 40 à 50 % et utiliser 1/2 de la profondeur de passe.  
Si la longueur est de 6 x le dia, veuillez réduire l'avance et la rotation de 60 à 70 % et utiliser 1/4 de la profondeur de passe.
2. Ajuster l'avance et la vitesse en fonction de la profondeur de coupe ou de la rigidité de la machine.
3. Utilisez un jet d'air comprimé ou des fluides de coupe de haute qualité avec un coef. élevé de ralentissement d'émission de fumée.

## Conditions - Schnittwerte - Condizioni - Conditions

High speed milling - HSC Schlichtfräsen -  
Fresatura alta velocità - Fraisage UGV

FXS-EBDS



Work material Werkstoff Materiale Matière à usiner	C≤0,2% - GG		SCM - SKD		30~45 HRC		45~55 HRC - HRS		55~60 HRC	
	S. (min <sup>-1</sup> )	F. (mm/min)								
Ø										
R 0.5 X 1	50.000	3.000	50.000	3.000	50.000	2.500	32.000	1.600	32.000	1.450
R 1 X 2	50.000	6.000	50.000	6.000	44.500	4.450	31.500	3.150	28.500	2.600
R 1.5 X 3	37.000	6.650	33.000	6.000	29.500	4.400	24.000	3.600	19.000	2.600
R 2 X 4	27.500	6.600	25.000	6.000	22.000	4.400	18.000	3.600	14.000	2.200
R 2.5 X 5	22.000	6.150	20.000	5.600	17.500	4.000	14.500	3.300	11.000	1.950
R 3 X 6	18.500	5.900	16.500	5.250	14.500	3.450	12.000	2.850	9.500	1.900
R 4 X 8	13.500	4.300	12.500	4.000	11.000	2.600	9.150	2.150	7.150	1.400
R 5 X 10	11.000	3.500	10.000	3.200	8.900	2.100	7.300	1.750	5.700	1.100
R 6 X 12	9.250	2.950	8.350	2.650	7.400	1.750	6.100	1.450	4.750	950
R 8 X 16	6.950	2.200	6.250	2.000	5.550	1.300	4.550	1.050	3.550	710
R 10 X 20	5.550	1.750	5.000	1.600	4.450	1.050	3.650	875	2.850	570
R 12.5 X 25	4.450	1.400	4.000	1.250	3.550	850	2.900	695	2.250	450

Max. cutting depth  
Maximale Schnitttiefe  
Profondità di taglio  
Profondeur de coupe

$aa = 0.02D$   
 $pf = 0.05D$

	$aa$	$pf$
$R \leq 8$	0.020	0.050
$8 < R$	0.32 mm	0.050

- Speeds and feeds are designed to be used in conjunction with small passes on a high speed & precision machine set-up.
  - Do not use inflammable coolant. Using worn tools may generate sparks.
  - Use compressed air or a high quality coolant with a low co-efficient of smoke emission.
- Die Schnittdaten sind ausgelegt für geringe Zustellungen in Verbindung mit HSC tauglichen Maschinen und Spanmittel.
  - Bitte geeignetes Kühlmittel mit rauchhemmenden Zusätzen verwenden.
  - Benutzen Sie Druckluft oder Kühlmittel mit rauchhemmenden Zusätzen.

- Queste velocità e questi avanzamenti sono indicati per fresatura di piccole passate ad alta velocità e centri di lavorazione di alta precisione.
  - Non utilizzare lubrificanti da taglio infiammabili; gli utensili troppo usurati possono produrre scintille.
  - Utilizzare un getto di aria compressa. Se la vostra scelta ricade su dei liquidi da taglio, sceglierli di alta qualità, dotati di un coefficiente elevato di rallentamento d'emissione del fumo.
- Les vitesses et avances sont indiquées pour le fraisage de petites passes à haute vitesse / centres d'usinage de haute précision.
  - Ne pas utiliser de lubrifiants de coupe inflammables, les outils fortement usés peuvent produire des étincelles.
  - Utilisez un jet d'air comprimé ou des fluides de coupe de haute qualité avec un coef. élevé de ralentissement d'émission de fumée.

FXS

FXS-EQD

Work material Werkstoff Materiale Matière à usiner	C≤0,2% - GG		SCM - SKD		30~38 HRC		38~45 HRC - SUS		45~55 HRC - HRS		55~60 HRC	
	S. (min <sup>-1</sup> )	F. (mm/min)										
Ø												
R0.5	32.000	860	32.000	860	32.000	860	32.000	86	32.000	860	32.000	765
R1	31.500	2.250	24.000	1.350	24.000	1.350	24.000	1.350	24.000	1.350	22.000	1.200
R2	17.500	2.500	15.500	1.800	14.000	1.550	13.500	1.450	12.500	1.350	11.000	1.150
R3	11.500	2.150	10.500	1.850	9.500	1.700	9.000	1.600	8.450	1.500	7.400	1.300
R4	8.750	1.800	7.950	1.400	7.150	1.250	6.850	1.200	6.350	1.100	5.550	995
R5	7.000	1.500	6.350	1.100	5.700	1.000	5.500	980	5.050	905	4.450	800
R6	6.650	1.170	5.950	1.050	4.750	840	4.550	800	4.200	745	3.800	680

Max. cutting depth  
Maximale Schnitttiefe  
Profondità di taglio  
Profondeur de coupe

$aa = 0.05D$   
 $pf = 0.1D$

$aa = 0.02D$   
 $pf = 0.1D$

- Use high precision machine set up to ensure maximum rigidity.
  - Set up speed & feed in accordance with with cutting conditions and and a high rigidity machine set up.
- Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spanmittel.
  - Bitte regulieren Sie Schnittgeschwindigkeit, Vorschub und Spantiefe entsprechend Ihrer aktuellen Zerspanungsbedingen.

- Utilizzare una macchina e un mandrino di elevata rigidità e di alta precisione.
  - Regolare la velocità e gli avanzamenti a seconda delle condizioni di taglio, della profondità di taglio e della rigidità della macchina.
- Utilisez une machine et un porte-outil de grande rigidité et de haute précision.
  - Réglez les vitesses et les avances d'après les conditions de coupe, la profondeur de coupe et la rigidité de la machine.

## Conditions - Schnittwerte - Condizioni - Conditions



## FXS-EBT

High speed milling roughing - HSC Schlichtfräsen Schruppen -  
Fresatura alta velocità sgrossatura - Fraisage UGV ébauche

Work material Werkstoff Materiale Matière à usiner	SKD - GG		30~38 HRC		38~45 HRC		45~55 HRC - HRS		55~60 HRC		60~65 HRC		65~70 HRC	
	S55C-SS400 ~750N/mm <sup>2</sup>		30~38 HRC		38~45 HRC		45~55 HRC		55~60 HRC		60~65 HRC		65~70 HRC	
	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
Ø														
R 1	33.400	3.700	25.100	2.800	23.900	2.200	19.100	1.650	15.900	1.200	12.700	885	7.950	555
R1.5	22.300	3.700	16.800	2.800	15.900	2.200	12.700	1.650	10.600	1.200	8.500	885	5.300	555
R 2	16.700	3.550	12.600	2.650	11.900	2.100	9.550	1.550	7.950	1.200	6.350	885	4.000	535
R2.5	13.400	3.350	10.100	2.550	9.550	2.000	7.650	1.450	6.350	1.150	5.100	825	3.200	515
R 3	11.100	3.050	8.400	2.300	7.950	1.950	6.350	1.400	5.300	1.050	4.250	795	2.650	495
R 4	8.350	2.950	6.300	2.250	5.590	1.900	4.750	1.350	4.000	1.050	3.200	765	2.000	475
R 5	6.700	2.900	5.050	2.200	4.750	1.850	3.800	1.300	3.200	995	2.550	735	1.600	460
R 6	5.550	2.650	4.200	2.000	4.000	1.600	3.200	1.200	2.650	915	2.100	610	1.350	380
R 8	4.200	2.000	3.150	1.500	3.000	1.300	2.400	915	2.000	715	1.600	460	995	285
R10	3.350	1.600	2.500	1.200	2.400	1.050	1.900	735	1.600	570	1.250	365	795	230

Max. cutting depth Maximale Schnitttiefe Profondità di taglio Profondeur de coupe			
	$a_{aMax}=0.5mm$	$a_{aMax}=0.5mm$	$a_{aMax}=0.5mm$

1. Use high precision machine set up to ensure maximum rigidity.
2. Use a coolant that has a low co-efficient of smoke emission.

1. Utilizzare una macchina e un mandrino di elevata rigidità e di alta precisione.
2. Utilizzare dei lubrificanti di taglio adeguati, dotati di un elevato coefficiente di rallentamento di emissione del fumo.

1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spanmittel.
2. Bitte geeignetes Kühlmedium mit rauchhemmenden Zusätzen verwenden.

1. Utilisez une machine et un porte-outil de grande rigidité et de haute précision.
2. Utilisez des lubrifiants de coupe adéquats, dotés d'un coef. élevé de ralentissement

## FXS

## FXS-EBT

High speed milling finishing - HSC Schlichtfräsen Schlichten -  
Fresatura alta velocità sgrossatura e finitura - Fraisage UGV finition

Work material Werkstoff Materiale Matière à usiner	SKD - GG		30~38 HRC		38~45 HRC		45~55 HRC - HRS		55~60 HRC		60~65 HRC		65~70 HRC	
	S55C-SS400 ~750N/mm <sup>2</sup>		30~38 HRC		38~45 HRC		45~55 HRC		55~60 HRC		60~65 HRC		65~70 HRC	
	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
Ø														
R 1	50.000	6.480	50.000	7.000	43.900	5.900	41.400	4.950	33.400	3.700	30.200	2.900	20.700	1.800
R1.5	36.100	7.000	34.000	6.750	32.900	5.900	27.600	4.950	22.300	3.700	20.200	2.900	13.800	1.800
R 2	27.100	6.500	25.500	5.850	24.700	5.450	20.700	4.550	16.700	3.350	15.100	2.600	10.300	1.700
R2.5	21.600	6.200	10.400	5.600	19.700	5.200	16.600	4.050	13.400	3.050	12.100	2.450	8.300	1.600
R 3	18.000	5.950	17.000	5.400	16.400	4.950	13.800	3.750	11.100	2.750	10.100	2.300	6.900	1.500
R 4	13.500	5.200	12.700	4.900	12.300	4.250	10.300	3.200	8.350	2.400	7.550	2.050	5.150	1.300
R 5	10.800	4.700	10.200	4.400	9.850	3.800	8.300	2.800	6.0700	2.100	6.050	1.750	4.150	1.200
R 6	9.000	4.350	8.500	4.050	8.200	3.550	6.900	2.600	5.550	1.950	5.050	1.450	3.450	995
R 8	6.750	3.250	6.350	3.050	6.150	2.650	5.150	1.950	4.200	1.500	3.800	1.100	2.600	745
R10	5.400	2.600	5.100	2.450	4.950	2.150	4.150	1.600	3.350	1.200	3.000	870	2.050	595

Max. cutting depth Maximale Schnitttiefe Profondità di taglio Profondeur de coupe		
	$a_{a} = 0.02D$	$pf = 0.05D$

1. Use high precision machine set up to ensure maximum rigidity.
2. Use a coolant that has a low co-efficient of smoke emission.

1. Utilizzare una macchina e un mandrino di elevata rigidità e di alta precisione.
2. Utilizzare dei lubrificanti di taglio adeguati, dotati di un elevato coefficiente di rallentamento di emissione del fumo.

1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spanmittel.
2. Bitte geeignetes Kühlmedium mit rauchhemmenden Zusätzen verwenden.

1. Utilisez une machine et un porte-outil de grande rigidité et de haute précision.
2. Utilisez des lubrifiants de coupe adéquats, dotés d'un coef. élevé de ralentissement

## Conditions - Schnittwerte - Condizioni - Conditions

High speed milling roughing - HSC Fräsen Schruppen -  
Fresatura alta velocità sgrossatura - Fraisage UGV ébauche

FXS-EBM - FXS-HS-EBM



Work material Werkstoff Materiale Matière à usiner	SKD - GG		30~38 HRC		38~45 HRC		45~55 HRC - HRS		55~60 HRC		60~65 HRC		65~70 HRC	
	S55C-SS400 ~750N/mm <sup>2</sup>		30~38 HRC		38~45 HRC		45~55 HRC		55~60 HRC		60~65 HRC		65~70 HRC	
	S.	F.	S.	F.	S.	F.	S.	F.	S.	F.	S.	F.	S.	F.
Ø	(min <sup>-1</sup> )	(mm/min)	(min <sup>-1</sup> )	(mm/min)	(min <sup>-1</sup> )	(mm/min)	(min <sup>-1</sup> )	(mm/min)	(min <sup>-1</sup> )	(mm/min)	(min <sup>-1</sup> )	(mm/min)	(min <sup>-1</sup> )	(mm/min)
R 3	11.100	4.050	8.400	3.050	7.950	2.600	6.350	1.850	5.300	1.450	4.250	1.050	2.650	660
R 4	8.350	3.950	6.300	3.000	5.950	2.500	4.750	1.750	4.000	1.400	3.200	1.000	2.000	635
R 5	6.700	3.850	5.050	2.900	4.750	2.450	3.800	1.700	3.200	1.300	2.550	975	1.600	610
R 6	5.550	3.550	4.200	2.650	4.000	2.150	3.200	1.600	2.650	1.200	2.100	815	1.350	510
R 8	4.200	2.650	3.150	2.000	3.000	1.700	2.400	1.200	2.000	955	1.600	610	995	380
R10	3.350	2.150	2.500	1.600	2.400	1.400	1.900	975	1.600	765	1.250	490	795	310
Max. cutting depth Maximale Schnitttiefe Profondità di taglio Profondeur de coupe														
					a <sub>a</sub> Max=0.5mm									

1. Use high precision machine set up to ensure maximum rigidity.
2. Use a coolant that has a low co-efficient of smoke emission.

1. Utilizzare una macchina e un mandrino di elevata rigidità e di alta precisione.
2. Utilizzare dei lubrificanti di taglio adeguati, dotati di un elevato coefficiente di rallentamento di emissione del fumo.

1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spanmittel.
2. Bitte geeignetes Kühlmedium mit rauchhemmenden Zusätzen verwenden.

1. Utilisez une machine et un porte-outil de grande rigidité et de haute précision.
2. Utilisez des lubrifiants de coupe adéquats, dotés d'un coef. élevé de ralentissement

High speed milling finishing - HSC Fräsen Schlichten -  
Fresatura alta velocità sgrossatura e finitura - Fraisage UGV finition

FXS-EBM - FXS-HS-EBM

FXS

Work material Werkstoff Materiale Matière à usiner	SKD - GG		30~38 HRC		38~45 HRC		45~55 HRC - HRS		55~60 HRC		60~65 HRC		65~70 HRC	
	S55C-SS400 ~750N/mm <sup>2</sup>		30~38 HRC		38~45 HRC		45~55 HRC		55~60 HRC		60~65 HRC		65~70 HRC	
	S.	F.	S.	F.	S.	F.	S.	F.	S.	F.	S.	F.	S.	F.
Ø	(min <sup>-1</sup> )	(mm/min)	(min <sup>-1</sup> )	(mm/min)	(min <sup>-1</sup> )	(mm/min)	(min <sup>-1</sup> )	(mm/min)	(min <sup>-1</sup> )	(mm/min)	(min <sup>-1</sup> )	(mm/min)	(min <sup>-1</sup> )	(mm/min)
R 3	16.700	6.100	16.200	5.900	15.900	5.200	13.300	3.800	10.100	2.700	9.000	2.250	6.350	1.600
R 4	12.500	5.950	12.100	5.750	11.900	5.050	9.950	3.700	7.550	2.600	6.750	2.150	4.750	1.550
R 5	10.000	5.800	9.700	5.590	9.550	4.900	7.950	3.550	6.050	2.500	5.400	2.100	3.800	1.450
R 6	8.350	5.350	8.100	5.200	7.950	4.300	6.650	3.300	5.050	2.300	4.500	1.750	3.200	1.200
R 8	6.250	4.000	6.050	3.900	5.950	3.800	4.950	2.550	3.800	1.800	3.400	1.300	2.400	915
R10	5.000	3.200	4.850	3.100	4.750	3.050	4.000	2.050	3.000	1.450	2.700	1.050	1.900	735
Max. cutting depth Maximale Schnitttiefe Profondità di taglio Profondeur de coupe														
					a <sub>a</sub> Max=1mm		a <sub>a</sub> Max=0.8mm		a <sub>a</sub> Max=0.5mm		a <sub>a</sub> Max=0.5mm		a <sub>a</sub> Max=0.3mm	

1. Use high precision machine set up to ensure maximum rigidity.
2. Use a coolant that has a low co-efficient of smoke emission.

1. Utilizzare una macchina e un mandrino di elevata rigidità e di alta precisione.
2. Utilizzare dei lubrificanti di taglio adeguati, dotati di un elevato coefficiente di rallentamento di emissione del fumo.

1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spanmittel.
2. Bitte geeignetes Kühlmedium mit rauchhemmenden Zusätzen verwenden.

1. Utilisez une machine et un porte-outil de grande rigidité et de haute précision.
2. Utilisez des lubrifiants de coupe adéquats, dotés d'un coef. élevé de ralentissement

Conditions - Schnittwerte - Condizioni - Conditions

FXS-HS-PKE

High speed milling - HSC Schlichtfräsen -  
Fresatura alta velocità - Fraisage UGV

Work material Werkstoff Materiale Matière à usiner	C≤0.2%		SCM - SKD		30~38 HRC		30~38 HRC - SUS		45~55 HRC - Tiall		30~38 HRC - SCM	
	SS400•S55C•FC250 ~750N/mm <sup>2</sup>		SCM•SKT•SKS•SKD ~30 HRC		SKT•SKD•NAK55•HPM1 30~38 HRC		SUS304• SKD 38~45 HRC		45~55 HRC		55~60 HRC	
	200 (m/min)		200 (m/min)		200 (m/min)		150 (m/min)		150 (m/min)		100 (m/min)	
Ø	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
6	10.600	3.050	10.600	2.650	10.600	2.000	7.950	1.450	7.950	1.400	5.300	765
8	7.950	2.800	7.950	2.400	7.950	1.900	5.950	1.400	5.950	1.300	4.000	715
10	6.350	2.550	6.350	2.200	6.350	1.850	4.750	1.350	4.750	1.250	3.200	635
12	5.300	2.550	5.300	2.200	5.300	1.850	4.000	1.350	4.000	1.250	2.650	635
16	4.000	2.400	4.000	2.200	4.000	1.850	3.000	1.350	3.000	1.250	2.000	635
20	3.200	1.900	3.200	1.900	3.200	1.600	2.400	1.200	2.400	1.100	1.600	635

Max. cutting depth  
Maximale Schnitttiefe  
Profondità di taglio  
Profondeur de coupe

a <sub>a</sub>	a <sub>r</sub>
1D	0.1D

Max a<sub>r</sub> = 1.5 mm

a <sub>a</sub>	a <sub>r</sub>
1D	0.05D

Max a<sub>r</sub> = 1.5 mm

a <sub>a</sub>	a <sub>r</sub>
1D	0.02D

1. Use highest possible speed.
2. On lower speed machines, use maximum speed & feed settings.
3. Cutter mis-alignment must not exceed 10µ.
4. Always use coolant.

1. Maximale Geschwindigkeit benutzen.
2. Bei konventionellen Maschinen, maximale Drehzahl - verwenden und den Vorschub entsprechend anpassen.
3. Fräserrundlauf darf max. 0.01 mm betragen.
4. Immer Kühlmittel benutzen.

1. Utilizza la velocità più alta possibile.
2. Quando utilizzate delle macchine di basse velocità, utilizzate la velocità più alta e regolatevi il passo di avanzamento.
3. Dopo il suo passaggio nel mandrino, la fresa non può avere un run-out superiore a 0.01 mm.
4. Utilizzare sempre dei liquidi da taglio.

1. Utilisez la vitesse la plus élevée possible.
2. Lorsque vous employez des machines de basses vitesses, utilisez la vitesse la plus haute et ajustez-y le taux d'avance.
3. Après sa fixation dans le porte-outil, la fraise ne peut avoir un faux rond supérieur à 10µ.
4. Utiliser toujours des fluides de coupe.

FXS

FXS-HS-PKE

High speed milling - HSC Schlichtfräsen -  
Fresatura alta velocità - Fraisage UGV

Work material Werkstoff Materiale Matière à usiner	C≤0.2% - GG		SCM - SKD		30~38 HRC		38~45 HRC - SUS		45~55 HRC - HRS		55~60 HRC	
	SS400•S55C•FC250 ~750N/mm <sup>2</sup>		SCM•SKT•SKS•SKD ~30 HRC		SKT•SKD•NAK55•HPM1 30~38 HRC		SUS304• SKD 38~45 HRC		45~55 HRC		55~60 HRC	
	200 (m/min)		200 (m/min)		200 (m/min)		150 (m/min)		150 (m/min)		100 (m/min)	
Ø	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
6	10.600	2.250	10.600	2.100	10.600	2.050	7.950	1.550	7.950	1.400	5.300	635
8	7.950	2.150	7.950	2.000	7.950	1.950	5.950	1.450	5.950	1.250	4.000	585
10	6.350	2.050	6.350	1.900	6.350	1.850	4.750	1.400	4.750	1.150	3.200	535
12	5.300	2.050	5.300	1.900	5.300	1.850	4.000	1.400	4.000	1.150	2.650	535
16	4.000	2.050	4.000	1.900	4.000	1.850	3.000	1.400	3.000	1.150	2.000	535
20	3.200	1.800	3.200	1.800	3.200	1.600	2.400	1.200	2.400	955	1.600	535

Max. cutting depth  
Maximale Schnitttiefe  
Profondità di taglio  
Profondeur de coupe

a <sub>a</sub>	a <sub>r</sub>
0.1D	0.30-0.5D

a <sub>a</sub>	a <sub>r</sub>
0.05D	0.20-0.3D

a <sub>a</sub>	a <sub>r</sub>
0.02D	0.20-0.3D

1. Conditions to be used if slant is = 3 x dia.  
  
If length is 5 x dia, than reduce feed and rotation by 30 to 40% and use 1/2 of depth of passes.  
If length is 6 x dia, than reduce feed and rotation by 40 to 60% and use 1/4 of depth of passes.
2. Adjust feed en rotation in function of depth of passes or machine rigidity.
3. Use compressed air or a high quality coolant with a low co-efficient of smoke emmision.

1. Die angegebenen Schnittdaten sind für eine max. Ausspanlänge von 3 x D.  
Bei 5 x D die Schnittgeschwindigkeit und den Vorschub um 30 bis 40% reduzieren, die Schnitttiefe auf ein 1/2 reduzieren.  
Bei 6 x D die Schnittgeschwindigkeit und den Vorschub um 40 bis 60% reduzieren, die Schnitttiefe auf ein 1/4 reduzieren.
2. Vorschub und Geschwindigkeit der Schnitttiefe und Maschinen-Starrheit anpassen.
3. Benutzen Sie Druckluft oder Kühlmittel mit rauchhemmenden Zusätzen.

1. Condizioni da utilizzare se la lunghezza dell'estensione dell'utensile è uguale a 3 volte il diametro.  
Se la lunghezza è di 5 volte il diametro ridurre l'avanzamento e la rotazione dal 30 al 40% ed utilizzare 1/2 della profondità di passata.  
Se la lunghezza è di 6 volte il diametro ridurre l'avanzamento e la rotazione dal 40 al 60% ed utilizzare 1/4 della profondità di passata.
2. Regolare l'avanzamento e la velocità in funzione di taglio o della rigidità della macchina.
3. Utilizzare un getto di aria compressa. Se la vostra scelta ricade su dei liquidi da taglio, sceglierli di alta qualità, dotati di un coefficiente elevato di rallentamento di emissione del fumo.

1. Conditions à utiliser si le porte-à-faux est = à 3 x le dia.  
Si la longueur est de 5 x le dia, veuillez réduire l'avance et la rotation de 30 à 40 % et utiliser 1/2 de la profondeur de passe.  
Si la longueur est de 6 x le dia, veuillez réduire l'avance et la rotation de 40 à 60 % et utiliser 1/4 de la profondeur de passe.
2. Ajuster l'avance et la vitesse en fonction de la profondeur de coupe ou de la rigidité de la machine.
3. Utilisez un jet d'air comprimé ou des fluides de coupe de haute qualité avec un coef. éle-

## Conditions - Schnittwerte - Condizioni - Conditions

High speed milling - HSC Schlichtfräsen -  
Fresatura alta velocità - Fraisage UGV

FXS-PKE



Work material Werkstoff Materiale Matière à usiner	C≤0,2% - GG		SCM - SKD		30~38 HRC		38~45 HRC - SUS		45~55 HRC - HRS		55~60 HRC	
	S55C•SS400 ~750N/mm <sup>2</sup>		SKD•SKS•SNCM ~30 HRC		NAK55•HPMI•SKT 30~38 HRC		SUS304• X210CR12• X40CRMOV51 38~45 HRC		45~55 HRC		55~60 HRC	
	200 (m/min)		200 (m/min)		200 (m/min)		150 (m/min)		150 (m/min)		100 (m/min)	
Ø	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
3	20.000	2.180	20.000	1.750	20.000	1.100	15.900	880	15.900	705	10.600	460
4	15.900	2.420	15.900	1.940	15.900	1.220	11.900	915	11.900	765	7.960	485
5	12.700	2.550	12.700	2.040	12.700	1.270	9.550	975	9.550	800	6.370	510
6	10.600	2.650	10.600	2.200	10.600	1.370	8.000	1.000	8.000	800	5.300	530
8	8.000	2.650	8.000	2.200	8.000	1.370	6.000	1.000	6.000	800	4.000	530
10	6.400	2.120	6.400	1.700	6.400	1.060	4.800	800	4.800	640	3.180	420
12	5.300	2.120	5.300	1.700	5.300	1.060	4.000	800	4.000	640	2.650	420
16	4.000	2.050	4.000	1.600	4.000	1.000	3.000	765	3.000	610	2.000	400
20	3.200	1.900	3.200	1.550	3.200	970	2.400	725	2.400	575	1.600	380
Max. cutting depth Maximale Schnitttiefe Profondità di taglio Profondeur de coupe												

1. Conditions to be used if slant is = 3 x dia.

If length is 5 x dia, then reduce feed and rotation by 30 to 40% and use 1/2 of depth of passes.  
If length is 6 x dia, then reduce feed and rotation by 40 to 60% and use 1/4 of depth of passes.

- Adjust feed and rotation in function of depth of passes or machine rigidity.
- Use compressed air or a high quality coolant with a low co-efficient of smoke emission.

- Die angegebenen Schnittdaten sind für eine max. Ausspannlänge von 3 x D.  
Bei 5 x D die Schnittgeschwindigkeit und den Vorschub um 30 bis 40% reduzieren, die Schnitttiefe auf ein 1/2 reduzieren.  
Bei 6 x D die Schnittgeschwindigkeit und den Vorschub um 40 bis 60% reduzieren, die Schnitttiefe auf ein 1/4 reduzieren.
- Vorschub und Geschwindigkeit der Schnitttiefe und Maschinen-Starrheit anpassen.
- Benutzen Sie Druckluft oder Kühlmittel mit rauchhemmenden Zusätzen.

1. Condizioni da utilizzare se la lunghezza dell'estensione dell'utensile è uguale a 3 volte il diametro.

Se la lunghezza è di 5 volte il diametro ridurre l'avanzamento e la rotazione dal 30 al 40% ed utilizzare 1/2 della profondità di passata.  
Se la lunghezza è di 6 volte il diametro ridurre l'avanzamento e la rotazione dal 40 al 60% ed utilizzare 1/4 della profondità di passata.

- Regolare l'avanzamento e la velocità in funzione di taglio o della rigidità della macchina.
- Utilizzare un getto di aria compressa. Se la vostra scelta ricade su dei liquidi da taglio, sceglierli di alta qualità, dotati di un coefficiente elevato di rallentamento di emissione del fumo.

- Conditions à utiliser si le porte-à-faux est = à 3 x le dia.  
Si la longueur est de 5 x le dia, veuillez réduire l'avance et la rotation de 30 à 40 % et utiliser 1/2 de la profondeur de passe.  
Si la longueur est de 6 x le dia, veuillez réduire l'avance et la rotation de 40 à 60 % et utiliser 1/4 de la profondeur de passe.
- Ajuster l'avance et la vitesse en fonction de la profondeur de coupe ou de la rigidité de la machine.
- Utilisez un jet d'air comprimé ou des fluides de coupe de haute qualité avec un coef. éle-

High speed milling - HSC Schlichtfräsen -  
Fresatura alta velocità - Fraisage UGV

FXS-PKE

Work material Werkstoff Materiale Matière à usiner	C≤0,2% - GG		SCM - SKD		30~38 HRC		38~45 HRC - SUS		45~55 HRC - HRS		55~60 HRC	
	S55C•SS400 ~750N/mm <sup>2</sup>		SKD•SKS•SNCM ~30 HRC		NAK55•HPMI•SKT 30~38 HRC		SUS304• X210CR12• X40CRMOV51 38~45 HRC		45~55 HRC		55~60 HRC	
	200 (m/min)		200 (m/min)		200 (m/min)		150 (m/min)		150 (m/min)		100 (m/min)	
Ø	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
3	20.000	1.340	20.000	1.080	20.000	840	15.900	800	15.900	440	10.600	280
4	15.900	1.500	15.900	1.200	15.900	940	11.900	820	11.900	460	7.960	300
5	12.700	1.580	12.700	1.250	12.700	995	9.550	860	9.550	475	6.370	300
6	10.600	1.600	10.600	1.280	10.600	1.000	8.000	1.000	8.000	500	5.300	310
8	8.000	1.600	8.000	1.280	8.000	1.000	6.000	1.000	6.000	500	4.000	310
10	6.400	1.300	6.400	1.000	6.400	800	4.800	700	4.800	400	3.180	250
12	5.300	1.300	5.300	1.000	5.300	800	4.000	700	4.000	400	2.650	250
16	4.000	1.300	4.000	1.000	4.000	790	3.000	690	3.000	400	2.000	255
20	3.200	1.250	3.200	970	3.200	765	2.400	610	2.400	380	1.600	255
Max. cutting depth Maximale Schnitttiefe Profondità di taglio Profondeur de coupe												

1. Conditions to be used if slant is = 3 x dia.

If length is 5 x dia, then reduce feed and rotation by 30 to 40% and use 1/2 of depth of passes.  
If length is 6 x dia, then reduce feed and rotation by 40 to 60% and use 1/4 of depth of passes.

- Adjust feed and rotation in function of depth of passes or machine rigidity.
- Use compressed air or a high quality coolant with a low co-efficient of smoke emission.

- Die angegebenen Schnittdaten sind für eine max. Ausspannlänge von 3 x D.  
Bei 5 x D die Schnittgeschwindigkeit und den Vorschub um 30 bis 40% reduzieren, die Schnitttiefe auf ein 1/2 reduzieren.  
Bei 6 x D die Schnittgeschwindigkeit und den Vorschub um 40 bis 60% reduzieren, die Schnitttiefe auf ein 1/4 reduzieren.
- Vorschub und Geschwindigkeit der Schnitttiefe und Maschinen-Starrheit anpassen.
- Benutzen Sie Druckluft oder Kühlmittel mit rauchhemmenden Zusätzen.

1. Condizioni da utilizzare se la lunghezza dell'estensione dell'utensile è uguale a 3 volte il diametro.

Se la lunghezza è di 5 volte il diametro ridurre l'avanzamento e la rotazione dal 30 al 40% ed utilizzare 1/2 della profondità di passata.  
Se la lunghezza è di 6 volte il diametro ridurre l'avanzamento e la rotazione dal 40 al 60% ed utilizzare 1/4 della profondità di passata.

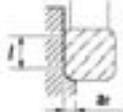
- Regolare l'avanzamento e la velocità in funzione di taglio o della rigidità della macchina.
- Utilizzare un getto di aria compressa. Se la vostra scelta ricade su dei liquidi da taglio, sceglierli di alta qualità, dotati di un coefficiente elevato di rallentamento di emissione del fumo.

- Conditions à utiliser si le porte-à-faux est = à 3 x le dia.  
Si la longueur est de 5 x le dia, veuillez réduire l'avance et la rotation de 30 à 40 % et utiliser 1/2 de la profondeur de passe.  
Si la longueur est de 6 x le dia, veuillez réduire l'avance et la rotation de 40 à 60 % et utiliser 1/4 de la profondeur de passe.
- Ajuster l'avance et la vitesse en fonction de la profondeur de coupe ou de la rigidité de la machine.
- Utilisez un jet d'air comprimé ou des fluides de coupe de haute qualité avec un coef. éle-

## Conditions - Schnittwerte - Condizioni - Conditions

FXS-MFE

High speed milling - HSC Schlichtfräsen -  
Fresatura alta velocità - Fraisage UGV

Work material Werkstoff Materiale Matière à usiner	C≤0,2%		SCM - SKD		30~38 HRC		38~45 HRC - SUS		45~55 HRC - HRS		55~60 HRC	
	S55C-SS400 ~750N/mm <sup>2</sup>		SKD-SKS-SNCM ~30 HRC		NAK55-HPMI-SKT 30~38 HRC		SUS304·X210CR12· X40CRMOV51 38~45 HRC		45~55 HRC		55~60 HRC	
	200 (m/min)		200 (m/min)		200 (m/min)		150 (m/min)		150 (m/min)		100 (m/min)	
Ø	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
10	6.400	2.120	6.400	1.700	6.400	1.060	4.800	800	4.800	640	3.180	420
12	5.300	2.120	5.300	1.700	5.300	1.060	4.000	800	4.000	640	2.650	420
14	4.550	2.120	4.550	1.700	4.550	1.060	3.400	800	3.400	640	2.270	420
18	3.500	1.750	3.500	1.400	3.500	1.060	2.650	800	2.650	640	1.750	420
22	2.900	1.450	2.900	1.150	2.900	1.060	2.170	800	2.170	640	1.450	420
Max. cutting depth Maximale Schnitttiefe Profondità di taglio Profondeur de coupe	$aa = f / (1.5D)$ $ar = 0.05D$								$aa = f / (1.5D)$ $ar = 0.02D$			

1. Conditions to be used if slant is = 3 x dia.

If length is 5 x dia, then reduce feed and rotation by 10 to 20%.

If length is 6 x dia, then reduce feed and rotation by 40 to 60% and use 1/2 of aa and 1/3 of ar.

- Adjust feed en rotation in function of depth of passes or machine rigidity.
- For milling > 18 mm, it is recommended to use machining center ISO50.
- Use compressed air or a high quality coolant with a low co-efficient of smoke emmision.

- Die angegebenen Schnittdaten sind für eine max. Ausspannlänge von 3 x D.  
Bei 5 x D die Schnittgeschwindigkeit und den Vorschub um 10 bis 20% reduzieren.  
Bei 6 x D die Schnittgeschwindigkeit und den Vorschub um 40 bis 60% reduzieren, die Schnitttiefe auf 1/2 aa und 1/3 ar.
- Vorschub und Geschwindigkeit der Schnitttiefe und Maschinen-Starrheit anpassen.
- Für Fräsen > 18 mm, empfehlen wir Maschinen mit ISO50.
- Benutzen Sie Druckluft oder Kühlmittel mit rauchhemmenden Zusätzen.

1. Condizioni da utilizzare se la lunghezza dell'estensione dell'utensile è uguale a 3 volte il diametro.

Se la lunghezza è di 5 volte il diametro, ridurre l'avanzamento e la rotazione dal 10 al 20%.  
Se la lunghezza è di 6 volte il diametro, ridurre l'avanzamento e la rotazione dal 40 al 60% ed utilizzare 1/2 di aa e 1/3 di ar.

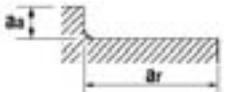
- Regolare l'avanzamento e la velocità in funzione di taglio o della rigidità della macchina.
- Per la fresatura superiore a 18 mm, è consigliato l'utilizzo di un centro di lavorazione ISO50.
- Utilizzare un getto di aria compressa. Se la vostra scelta ricade su dei liquidi da taglio, sceglierli di alta qualità, dotati di un coefficiente elevato di rallentamento di emissione del fumo.

- Conditions à utiliser si le porte-à-faux est = à 3 x le dia.  
Si la longueur est de 5 x le dia, veuillez réduire l'avance et la rotation de 10 à 20%.  
Si la longueur est de 6 x le dia, veuillez réduire l'avance et la rotation de 40 à 60 % et utiliser 1/2 de aa et 1/3 de ar.
- Ajuster l'avance et la vitesse en fonction de la profondeur de coupe ou de la rigidité de la machine.
- Pour le fraisage > 18 mm, il est recommandé d'utiliser un C.U. ISO50.
- Utilisez un jet d'air comprimé ou des fluides de coupe de haute qualité avec un coef. éle-

FXS

FXS-MFE

High speed milling - HSC Schlichtfräsen -  
Fresatura alta velocità - Fraisage UGV

Work material Werkstoff Materiale Matière à usiner	C≤0,2%		SCM - SKD		30~38 HRC		38~45 HRC - SUS		45~55 HRC - HRS		55~60 HRC	
	S55C-SS400 ~750N/mm <sup>2</sup>		SKD-SKS-SNCM ~30 HRC		NAK55-HPMI-SKT 30~38 HRC		SUS304·X210CR12· X40CRMOV51 38~45 HRC		45~55 HRC		55~60 HRC	
	200 (m/min)		200 (m/min)		200 (m/min)		150 (m/min)		150 (m/min)		100 (m/min)	
Ø	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
10	6.400	1.300	6.400	1.000	4.800	800	4.800	700	4.800	400	3.180	250
12	5.300	1.300	5.300	1.000	4.000	800	4.000	700	4.000	400	2.650	250
14	4.550	1.300	4.550	1.000	3.400	800	3.400	700	3.400	400	2.270	250
18	3.500	1.300	3.500	1.000	2.650	800	2.650	700	2.650	400	1.750	250
22	2.900	1.300	2.900	1.000	2.170	800	2.170	700	2.170	400	1.450	250
Max. cutting depth Maximale Schnitttiefe Profondità di taglio Profondeur de coupe	$aa = 0.1D$ $ar = 0.3D-0.5D$								$aa = 0.05D$ $ar = 0.2D-0.3D$		$aa = 0.02D$ $ar = 0.2D-0.3D$	

1. Conditions to be used if slant is = 3 x dia.

If length is 5 x dia, then reduce feed and rotation by 10 to 20%.

If length is 6 x dia, then reduce feed and rotation by 40 to 60% and use 1/2 of aa and 1/3 of ar.

- Adjust feed en rotation in function of depth of passes or machine rigidity.
- For milling > 18 mm, it is recommended to use machining center ISO50.
- Use compressed air or a high quality coolant with a low co-efficient of smoke emmision.

- Die angegebenen Schnittdaten sind für eine max. Ausspannlänge von 3 x D.  
Bei 5 x D die Schnittgeschwindigkeit und den Vorschub um 10 bis 20% reduzieren.  
Bei 6 x D die Schnittgeschwindigkeit und den Vorschub um 40 bis 60% reduzieren, und 1/2 aa und 1/3 ar.
- Vorschub und Geschwindigkeit der Schnitttiefe und Maschinen-Starrheit anpassen.
- Für Fräsen > 18 mm, empfehlen wir Maschinen mit ISO50.
- Benutzen Sie Druckluft oder Kühlmittel mit rauchhemmenden Zusätzen.

1. Condizioni da utilizzare se la lunghezza dell'estensione dell'utensile è uguale a 3 volte il diametro.

Se la lunghezza è di 5 volte il diametro, ridurre l'avanzamento e la rotazione dal 10 al 20%.  
Se la lunghezza è di 6 volte il diametro, ridurre l'avanzamento e la rotazione dal 40 al 60% ed utilizzare 1/2 di aa e 1/3 di ar.

- Regolare l'avanzamento e la velocità in funzione di taglio o della rigidità della macchina.
- Per la fresatura superiore a 18 mm, è consigliato l'utilizzo di un centro di lavorazione ISO50.
- Utilizzare un getto di aria compressa. Se la vostra scelta ricade su dei liquidi da taglio, sceglierli di alta qualità, dotati di un coefficiente elevato di rallentamento di emissione del fumo.

- Conditions à utiliser si le porte-à-faux est = à 3 x le dia.  
Si la longueur est de 5 x le dia, veuillez réduire l'avance et la rotation de 10 à 20%.  
Si la longueur est de 6 x le dia, veuillez réduire l'avance et la rotation de 40 à 60 % et utiliser 1/2 de aa et 1/3 de ar.
- Ajuster l'avance et la vitesse en fonction de la profondeur de coupe ou de la rigidité de la machine.
- Pour le fraisage > 18 mm, il est recommandé d'utiliser un C.U. ISO50.
- Utilisez un jet d'air comprimé ou des fluides de coupe de haute qualité avec un coef. éle-

Conditions - Schnittwerte - Condizioni - Conditions

FXS-RB-TPE - FXS-RB-TPB - FXS-RB-TPCR



Work material Werkstoff Materiale Matière à usiner		C≤0,2% - GG E24·XC48·FT25 750 MPA				SCM - SKD 35NCD16·40CMD8 30 HRC				30~38 HRC 35NCD16 30~38 HRC				38~45 HRC - SUS Z40CDV5 38~45 HRC				45~55 HRC Z160CDV12 45~55 HRC			
		150 (m/min)				140 (m/min)				120 (m/min)				90 (m/min)				75 (m/min)			
Ø (mm)	L utile (mm)	S <sub>v</sub> (min <sup>-1</sup> )	F <sub>v</sub> (mm/min)	AZ (mm)	a <sub>a</sub>	S <sub>v</sub> (min <sup>-1</sup> )	F <sub>v</sub> (mm/min)	AZ (mm)	a <sub>a</sub>	S <sub>v</sub> (min <sup>-1</sup> )	F <sub>v</sub> (mm/min)	AZ (mm)	a <sub>a</sub>	S <sub>v</sub> (min <sup>-1</sup> )	F <sub>v</sub> (mm/min)	AZ (mm)	a <sub>a</sub>	S <sub>v</sub> (min <sup>-1</sup> )	F <sub>v</sub> (mm/min)	AZ (mm)	a <sub>a</sub>
0.5	2	40000	960	0.012	0.025	40000	912	0.011	0.025	40000	605	0.008	0.025	40000	864	0.011	0.025	40000	864	0.011	0.013
0.5	4	40000	880	0.011	0.022	40000	836	0.010	0.022	40000	554	0.007	0.022	40000	792	0.010	0.022	40000	792	0.010	0.011
0.5	6	40000	800	0.010	0.020	40000	760	0.010	0.020	40000	504	0.006	0.020	40000	720	0.009	0.020	40000	720	0.009	0.010
0.6	4	40000	960	0.012	0.025	40000	912	0.011	0.025	40000	605	0.008	0.025	40000	864	0.011	0.025	39809	860	0.011	0.013
0.6	6	40000	880	0.011	0.020	40000	836	0.010	0.020	40000	554	0.007	0.020	40000	792	0.010	0.020	39809	788	0.010	0.010
0.7	6	40000	1040	0.013	0.020	40000	988	0.012	0.020	40000	655	0.008	0.020	40000	936	0.012	0.020	34122	798	0.012	0.010
0.7	8	40000	960	0.012	0.020	40000	912	0.011	0.020	40000	605	0.008	0.020	40000	864	0.011	0.020	34122	737	0.011	0.010
0.8	6	40000	1600	0.020	0.030	40000	1520	0.019	0.030	40000	1008	0.013	0.030	35828	1290	0.018	0.030	29857	955	0.016	0.015
0.8	8	40000	1440	0.018	0.025	40000	1368	0.017	0.025	40000	907	0.011	0.025	35828	1161	0.016	0.025	29857	896	0.015	0.013
0.8	10	40000	1200	0.015	0.020	40000	1140	0.014	0.020	40000	756	0.009	0.020	35828	967	0.014	0.020	29857	836	0.014	0.010
0.9	6	40000	1600	0.020	0.035	40000	1520	0.019	0.035	40000	1008	0.013	0.035	31847	1146	0.018	0.035	26539	955	0.018	0.018
0.9	8	40000	1360	0.017	0.030	40000	1292	0.016	0.030	40000	857	0.011	0.030	31847	975	0.015	0.030	26539	812	0.015	0.015
0.9	10	40000	1200	0.015	0.025	40000	1140	0.014	0.025	40000	756	0.009	0.025	31847	860	0.014	0.025	26539	717	0.014	0.013
1	8	40000	1760	0.022	0.035	40000	1672	0.021	0.035	38217	1059	0.014	0.035	28662	1135	0.020	0.035	23885	946	0.020	0.018
1	10	40000	1600	0.020	0.030	40000	1520	0.019	0.030	38217	963	0.013	0.030	28662	1032	0.018	0.030	23885	860	0.018	0.015
1	12	40000	1440	0.018	0.025	40000	1368	0.017	0.025	38217	867	0.011	0.025	28662	929	0.016	0.025	23885	774	0.016	0.013
1.2	8	39809	2229	0.028	0.040	37155	1977	0.027	0.040	31847	1124	0.018	0.040	23885	1204	0.025	0.040	19904	1003	0.025	0.020
1.2	10	39809	1990	0.025	0.035	37155	1765	0.024	0.035	31847	1003	0.016	0.035	23885	1075	0.023	0.035	19904	896	0.023	0.018
1.2	12	39809	1752	0.022	0.030	37155	1553	0.021	0.030	31847	883	0.014	0.030	23885	946	0.020	0.030	19904	788	0.020	0.015
1.2	16	39809	1433	0.018	0.025	37155	1271	0.017	0.025	31847	722	0.011	0.025	23885	774	0.016	0.025	19904	645	0.016	0.013
1.5	8	31847	2166	0.034	0.050	29724	1920	0.032	0.050	25478	1091	0.021	0.050	19108	1169	0.031	0.050	15924	975	0.031	0.025
1.5	10	31847	2038	0.032	0.040	29724	1807	0.030	0.040	25478	1027	0.020	0.040	19108	1101	0.029	0.040	15924	917	0.029	0.020
1.5	12	31847	1911	0.030	0.035	29724	1694	0.029	0.035	25478	963	0.019	0.035	19108	1032	0.027	0.035	15924	860	0.027	0.018
1.5	16	31847	1720	0.027	0.030	29724	1525	0.026	0.030	25478	867	0.017	0.030	19108	929	0.024	0.030	15924	774	0.024	0.015
1.5	20	31847	1592	0.025	0.025	29724	1412	0.024	0.025	25478	803	0.016	0.025	19108	860	0.023	0.025	15924	717	0.023	0.013
1.6	8	29857	2209	0.037	0.055	27866	1959	0.035	0.055	23885	1114	0.023	0.055	17914	1193	0.033	0.055	14928	994	0.033	0.028
1.6	10	29857	2090	0.035	0.045	27866	1853	0.033	0.045	23885	1053	0.022	0.045	17914	1129	0.032	0.045	14928	940	0.032	0.023
1.6	12	29857	1791	0.030	0.040	27866	1588	0.029	0.040	23885	903	0.019	0.040	17914	967	0.027	0.040	14928	806	0.027	0.020
1.6	16	29857	1612	0.027	0.035	27866	1430	0.026	0.035	23885	813	0.017	0.035	17914	871	0.024	0.035	14928	726	0.024	0.018
1.6	20	29857	1493	0.025	0.030	27866	1324	0.024	0.030	23885	752	0.016	0.030	17914	806	0.023	0.030	14928	672	0.023	0.015
1.8	8	26539	2229	0.042	0.060	24770	1977	0.040	0.060	21231	1124	0.026	0.060	15924	1204	0.038	0.060	13270	1003	0.038	0.030
1.8	10	26539	2123	0.040	0.055	24770	1883	0.038	0.055	21231	1070	0.025	0.055	15924	1146	0.036	0.055	13270	955	0.036	0.028
1.8	12	26539	1858	0.035	0.050	24770	1647	0.033	0.050	21231	936	0.022	0.050	15924	1003	0.032	0.050	13270	836	0.032	0.025
1.8	16	26539	1592	0.030	0.045	24770	1412	0.029	0.045	21231	803	0.019	0.045	15924	860	0.027	0.045	13270	717	0.027	0.023
1.8	20	26539	1433	0.027	0.040	24770	1271	0.026	0.040	21231	722	0.017	0.040	15924	774	0.024	0.040	13270	645	0.024	0.020
2	10	23885	2197	0.046	0.065	22293	1948	0.044	0.065	19108	1108	0.029	0.065	14331	1187	0.041	0.065	11943	989	0.041	0.033
2	12	23885	1911	0.040	0.055	22293	1694	0.038	0.055	19108	963	0.025	0.055	14331	1032	0.036	0.055	11943	860	0.036	0.028
2	16	23885	1672	0.035	0.050	22293	1482	0.033	0.050	19108	843	0.022	0.050	14331	903	0.032	0.050	11943	752	0.032	0.025
2	20	23885	1433	0.030	0.045	22293	1271	0.029	0.045	19108	722	0.019	0.045	14331	774	0.027	0.045	11943	645	0.027	0.023
2	25	23885	1194	0.025	0.040	22293	1059	0.024	0.040	19108	602	0.016	0.040	14331	645	0.023	0.040	11943	537	0.023	0.020
2.5	10	19108	2178	0.057	0.130	17834	1931	0.054	0.130	15287	1098	0.036	0.130	11465	1176	0.051	0.130	9554	980	0.051	0.065
2.5	12	19108	1911	0.050	0.125	17834	1694	0.048	0.125	15287	963	0.032	0.125	11465	1032	0.045	0.125	9554	860	0.045	0.063
2.5	16	19108	1720	0.045	0.110	17834	1525	0.043	0.110	15287	867	0.028	0.110	11465	929	0.041	0.110	9554	774	0.041	0.055
2.5	20	19108	1529	0.040	0.100	17834	1355	0.038	0.100	15287	770	0.025	0.100	11465	825	0.036	0.100	9554	688	0.036	0.050
2.5	25	19108	1338	0.035	0.080	17834	1186	0.033	0.080	15287	674	0.022	0.080	11465	722	0.032	0.080	9554	602	0.032	0.040
2.5	30	19108	1146	0.030	0.070	17834	1017	0.029	0.070	15287	578	0.019	0.070	11465	619	0.027	0.070	9554	516	0.027	0.035
3	25	15924	2166	0.068	0.150	14862	1920	0.065	0.150	12739	1091	0.043	0.150	9554	1169	0.061	0.150	7962	975	0.061	0.075
3	40	15924	1592	0.050	0.100	14862	1412	0.048	0.100	12739	803	0.032	0.100	9554	860	0.045	0.100	7962	717	0.045	0.050

Max. cutting depth  
Maximale Schnitttiefe  
Profondità di taglio  
Profondeur de coupe



- To reach the final depth, use a succession of small passes.
  - When machining the corner, reduce feed by half.
  - Always use coolant.
- \* Modified parameters

- Per raggiungere la profondità desiderata nel processo RIB (nervature), conviene effettuare la fresatura gradualmente con piccole passate.
  - Per fresare gli angoli, ridurre i tassi d'avanzamento di circa la metà.
  - Utilizzare in tutti i casi dei liquidi di lubrificazione.
- \* Parametro modificato

- Um die gewünschte Frästiefe zu erreichen, immer mit kleinen Steps arbeiten.
  - Bei Eckenfräsen Vorschub um 50% reduzieren.
  - Immer Kühlmittel benutzen.
- \* Modifizierten Parameters

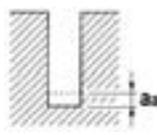
- Pour atteindre la profondeur à nervurer souhaitée, il convient de fraiser par petites passes successives.
  - Pour fraiser des angles, réduire le taux d'avance d'environ la moitié.
  - Utiliser dans tous les cas des fluides de lubrification.
- \* Paramètres modifiés

## Conditions - Schnittwerte - Condizioni - Conditions

## FX-RB-EGS

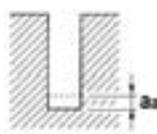
Work material Werkstoff Materiale Matière à usiner	C≤0,2% - GG			SCM - SKD			30~38 HRC		
	S55C+Si44+FC250 ~750N/mm <sup>2</sup>			SKD-SKS-SNCM ~30 HRC			NAK55+HPMI-SKT 30~38 HRC		
Ø	S. (min <sup>-1</sup> )	F. (mm/min)	a <sub>a</sub>	S. (min <sup>-1</sup> )	F. (mm/min)	a <sub>a</sub>	S. (min <sup>-1</sup> )	F. (mm/min)	a <sub>a</sub>
0.4	30.000 ~32.000	160~200	0.008~0.02	28.500 ~32.000	100~150	0.008~0.02	28.500 ~32.000	80~150	0.008~0.02
0.5	30.000 ~32.000	160~250	0.01 ~0.025	28.500 ~32.000	130~200	0.01 ~0.025	28.500 ~32.000	100~200	0.01 ~0.025
0.6	30.000 ~32.000	160~300	0.012~0.03	28.500 ~32.000	160~250	0.012~0.03	23.500 ~29.500	130~220	0.012~0.03
0.7	30.000 ~32.000	160~350	0.014~0.035	24.500 ~30.500	160~300	0.014~0.035	20.000 ~25.000	130~250	0.014~0.035
0.8	26.500 ~31.500	160~400	0.016~0.04	21.000 ~27.000	160~350	0.016~0.04	17.500 ~22.000	130~250	0.016~0.04
0.9	23.500 ~29.500	180~450	0.018~0.045	19.000 ~24.000	160~400	0.018~0.045	15.500 ~19.500	130~300	0.018~0.045
1	21.000 ~26.500	180~500	0.05 ~0.1	17.000 ~21.500	160~450	0.05 ~0.1	14.000 ~17.500	130~350	0.05 ~0.1
1.2	17.500 ~22.000	200~600	0.06 ~0.12	14.000 ~18.000	160~500	0.06 ~0.12	11.500 ~14.500	130~350	0.06 ~0.12
1.4	15.000 ~19.000	200~600	0.07 ~0.14	12.000 ~15.000	160~500	0.07 ~0.14	10.000 ~12.500	130~350	0.07 ~0.14
1.5	14.000 ~17.500	200~600	0.075~0.15	11.000 ~14.000	160~500	0.075~0.15	9.500 ~11.500	130~400	0.075~0.15
1.6	13.000 ~16.500	200~600	0.08 ~0.16	10.500 ~13.500	160~500	0.08 ~0.16	8.950 ~11.000	130~400	0.08 ~0.16
1.7	12.500 ~15.500	200~600	0.085~0.17	10.000 ~12.500	160~500	0.085~0.17	8.400 ~10.000	130~400	0.085~0.17
1.8	11.500 ~14.500	200~600	0.09 ~0.18	9.500 ~12.000	160~500	0.09 ~0.18	7.950 ~ 9.000	130~400	0.09 ~0.18
1.9	11.000 ~14.000	200~600	0.095~0.19	9.000 ~11.000	160~500	0.095~0.19	7.500 ~ 9.350	130~400	0.095~0.19
2	10.500 ~13.000	200~600	0.1 ~0.2	8.550 ~10.500	160~500	0.1 ~0.2	7.150 ~ 8.900	130~400	0.1 ~0.2
2.5	8.500 ~10.500	200~600	0.125~0.25	6.850 ~ 8.650	160~500	0.125~0.25	5.700 ~ 7.100	130~400	0.125~0.25
3	7.100 ~ 8.900	200~600	0.15 ~0.3	5.700 ~ 7.200	160~500	0.15 ~0.3	4.750 ~ 5.900	130~400	0.15 ~0.3

Max. cutting depth  
Maximale Schnitttiefe  
Profondità di taglio  
Profondeur de coupe



Work material Werkstoff Materiale Matière à usiner	38~45 HRC - SUS			45~55 HRC - HRS			55~60 HRC		
	SUS304+ X210CR12+ X40CRMOV51 38~45 HRC			45~55 HRC			NAK55+HPMI-SKT 55~60 HRC		
Ø	S. (min <sup>-1</sup> )	F. (mm/min)	a <sub>a</sub>	S. (min <sup>-1</sup> )	F. (mm/min)	a <sub>a</sub>	S. (min <sup>-1</sup> )	F. (mm/min)	a <sub>a</sub>
0.4	28.500 ~32.000	50~100	0.008~0.02	19.000 ~23.000	30~80	0.004~0.008	12.500	20~30	0.004
0.5	24.000 ~30.500	50~150	0.01 ~0.025	15.000 ~19.000	30~80	0.005~0.01	10.000	20~30	0.005
0.6	20.000 ~25.000	50~200	0.012~0.03	12.500 ~15.500	30~80	0.006~0.012	8.450	20~30	0.006
0.7	17.000 ~21.500	50~200	0.014~0.035	10.500 ~13.500	30~80	0.007~0.014	7.250	20~30	0.007
0.8	15.000 ~19.000	50~200	0.016~0.04	9.500 ~11.500	30~80	0.008~0.016	6.350	20~30	0.008
0.9	13.000 ~16.500	80~230	0.018~0.045	8.450 ~10.500	40~80	0.009~0.018	5.650	20~30	0.009
1	12.000 ~15.000	80~250	0.05 ~0.1	7.600 ~ 9.500	40~80	0.01 ~0.02	5.050	20~30	0.01 ~0.02
1.2	10.000 ~12.500	80~250	0.06 ~0.12	6.350 ~ 7.950	40~80	0.012~0.024	4.200	20~30	0.012~0.024
1.4	8.600 ~10.500	80~250	0.07 ~0.14	5.450 ~ 6.800	40~80	0.014~0.028	3.600	20~30	0.014~0.028
1.5	8.050 ~10.000	80~250	0.075~0.15	5.050 ~ 6.350	40~80	0.015~0.03	3.350	20~30	0.015~0.03
1.6	7.550 ~ 9.500	80~250	0.08 ~0.16	4.750 ~ 5.950	40~80	0.016~0.032	3.150	20~30	0.016~0.032
1.7	7.100 ~ 8.950	80~250	0.085~0.17	4.450 ~ 5.600	40~80	0.017~0.034	2.950	20~30	0.017~0.034
1.8	6.700 ~ 8.450	80~250	0.09 ~0.18	4.200 ~ 5.300	40~80	0.018~0.036	2.800	20~30	0.018~0.036
1.9	6.350 ~ 8.000	80~250	0.095~0.19	4.000 ~ 5.000	40~80	0.019~0.038	2.650	20~30	0.019~0.038
2	6.000 ~ 7.600	80~250	0.1 ~0.2	3.800 ~ 4.750	40~80	0.02 ~0.04	2.500	20~30	0.02 ~0.04
2.5	4.800 ~ 6.100	80~250	0.125~0.25	3.050 ~ 3.800	40~80	0.025~0.05	2.000	20~30	0.025~0.05
3	4.000 ~ 5.050	80~250	0.15 ~0.3	2.500 ~ 3.150	40~80	0.03 ~0.06	1.650	20~30	0.03 ~0.06

Max. cutting depth  
Maximale Schnitttiefe  
Profondità di taglio  
Profondeur de coupe



- For extra deep milling, it may be necessary to use end mills with increasing neck length to reach the required depth.
- For corner processing reduce feed by 50%.
- Use coolant.

- Bei sehr tiefen Fräsanwendung kann es möglich sein Fräser auszuwählen mit entsprechendem Freischliff um die notwendige Bearbeitungstiefe zu erreichen.
- Beim Eckenfräsen den Vorschub 50% reduzieren.
- Verwenden Sie Kühlmittel.

- Per una fresatura molto profonda, è necessario usare delle frese con la lunghezza del collo in aumento per raggiungere la profondità richiesta.
- Per lavorazioni angolari ridurre l'avanzamento al 50%
- Utilizzare dei lubrificanti di taglio adeguati, dotati di un elevato coefficiente di rallentamento di emissione del fumo.

- Afin d'atteindre la profondeur souhaitée, veuillez utiliser les différentes dimensions de dégagement graduellement..
- Corner processing réduire l'avance de moitié.
- Utilisez des lubrifiants.

## Conditions - Schnittwerte - Condizioni - Conditions

High speed slotting milling - HSC Nutenfräsen -  
Fresatura alta velocità per scanalature profonde - Fraisage UGV rainurage

FX-LN-EMS-6



Work material Werkstoff Materiale Matière à usiner	C≤0,2% - GG		SCM - SKD		30~38 HRC		38~45 HRC - SUS		45~55 HRC - Tiall		55~60 HRC - HRS	
	SS400•S55C•FC250 ~750N/mm <sup>2</sup>		SCM • SKT • SKS • SKD ~30 HRC		SKT • SKD • NAK55 • HPM1 30~38 HRC		SUS304• SKD 38~45 HRC		45~55 HRC		55~60 HRC	
	100 (m/min)		78 (m/min)		66 (m/min)		62 (m/min)		60 (m/min)		30 (m/min)	
Ø	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
1	26.500	1.000	21.500	700	17.500	500	15.000	400	9.500	160	6.350	60
1.5	17.500	1.000	14.000	700	11.500	500	10.000	400	6.350	160	4.250	60
2	13.000	1.050	10.500	700	8.900	590	7.600	400	4.750	160	3.200	60
2.5	10.400	1.250	8.400	700	7.100	500	6.100	400	3.800	160	2.550	60
3	8.900	1.000	7.200	700	5.900	500	5.050	400	3.150	160	2.100	60
4	6.650	1.000	5.400	700	4.450	500	3.800	400	2.350	160	1.550	60
5	5.300	1.000	4.300	700	3.550	500	3.050	400	1.900	160	1.250	60
6	4.450	1.000	3.600	700	2.950	500	2.500	400	1.550	160	1.050	60
Max. cutting depth Maximale Schnitttiefe Profondità di taglio Profondeur de coupe	$a_p = 0,50$ 						$a_p = 0,050$ 					

1. Use a rigid and precise machine and holder.
2. When chattering occurs, reduce the speed and feed simultaneously.
3. Use a suitable cutting fluid with high smoke retardant properties.

1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spanmittel.
2. Falls Vibrationen auftreten sollten, Vorschub und Schnittgeschwindigkeit reduzieren.
3. Benutzen Sie Kühlmittel mit rauchhemmenden Zusätzen.

1. Utilizzare una macchina ed un mandrino di elevata rigidità e di alta precisione.
2. In caso di vibrazione, ridurre simultaneamente la velocità di taglio e l'avanzamento.
3. Utilizzare dei lubrificanti di taglio adeguanti, dotati di una elevato coefficiente di rallentamento di emissione del fumo.

1. Utiliser une machine et un porte-outil de grande rigidité et de haute précision.
2. Utiliser de l'arrosage en brouillard (mist).
3. Utiliser des fluides de coupes de haute qualité avec un coef. élevé de ralentissement d'émission de fumée.

FX

## Conditions - Schnittwerte - Condizioni - Conditions

FX-MG-EHS - FX-CR-MG-EHS

Side milling - Konturfräsen -  
Contornatura - Contournage

	Work material Werkstoff Materiale Matière à usiner	C≤0,2% - GG		SCM - SKD		30~38 HRC		38~45 HRC - SUS		45~55 HRC - HRS		55~60 HRC	
		S. (min <sup>-1</sup> )	F. (mm/min)										
3 flutes - 3 Schneiden - 3 denti - 3 lèvres	Ø												
	3 X 3	8.900	665	6.650	595	5.900	350	3.800	90	3.150	55	2.000	30
	4 X 3	6.650	695	5.000	675	4.450	400	2.850	100	2.350	70	1.550	35
	5 X 3	5.300	715	4.000	660	3.550	360	2.250	105	1.900	70	1.250	35
	6 X 3	5.300	755	4.000	660	3.550	315	2.200	150	1.900	90	1.250	30
	8 X 3	3.950	700	3.000	595	2.650	205	1.650	155	1.400	100	955	35
	10 X 3	3.150	640	2.400	565	2.100	260	1.300	140	1.100	100	760	35
	12 X 3	2.650	605	2.000	515	1.750	235	1.100	125	955	85	635	30
	14 X 3	2.250	570	1.700	450	1.500	205	955	105	815	75	545	25
	16 X 3	1.950	520	1.500	415	1.300	180	835	95	715	70	475	20
	18 X 3	1.750	480	1.300	370	1.150	170	740	85	635	70	420	20
20 X 3	1.550	445	1.200	340	1.050	160	665	80	570	70	380	20	
25 X 3	1.250	415	965	280	850	140	535	85	455	70	305	20	
4 flutes - 4 Schneiden - 4 denti - 4 lèvres	3 X 4	8.900	890	6.650	795	5.900	470	3.800	120	3.150	75	2.000	40
	4 X 4	6.650	930	5.000	900	4.450	530	2.850	135	2.350	90	1.550	50
	5 X 4	5.300	950	4.000	880	3.550	480	2.250	140	1.900	95	1.250	50
	6 X 4	5.300	900	4.000	800	3.550	220	2.200	175	1.900	110	1.250	50
	8 X 4	3.950	835	3.000	710	2.650	445	1.650	185	1.400	120	955	55
	10 X 4	3.150	760	2.400	680	2.100	310	1.300	165	1.100	115	760	55
	12 X 4	2.650	730	2.000	620	1.750	285	1.100	145	955	105	635	45
	14 X 4	2.250	675	1.700	550	1.500	245	955	125	815	95	545	40
	16 X 4	1.950	615	1.500	500	1.300	215	835	110	715	85	475	35
	18 X 4	1.750	580	1.300	440	1.150	195	740	100	635	85	420	35
	20 X 4	1.550	530	1.200	410	1.050	185	665	95	570	85	380	35
25 X 4	1.250	500	965	340	850	170	535	100	455	85	305	35	
	Max. cutting depth Maximale Schnitttiefe Profondità di taglio Profondeur de coupe												

1. Use high precision machine set up to ensure maximum rigidity.
2. Set up speed & feed in accordance with with cutting conditions and and a high rigidity machine set up.
3. Use a coolant that has a low co-efficient of smoke emission.
4. For stainless steels & heat resisting steels, non-water soluble coolant is highly recommended.
5. For dry milling, use compressed air to aid chip clearance.

1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spannmittel.
2. Bitte regulieren Sie Schnittgeschwindigkeit, Vorschub und Spantiefe entsprechend Ihrer aktuellen Zerspanungsbedingen.
3. Bitte geeignetes Kühlmedium mit rauchhemmenden Zusätzen verwenden.
4. Für VA und gehärteterer Stahl, empfehlen wir keine wasserlöslichen Kühlmittel.
5. Bei Trockenbearbeitung Druckluft zum Entfernen der Späne verwenden.

1. Utilizzare una macchina e un mandrino di elevata rigidità e di alta precisione.
2. Regolare la velocità e gli avanzamenti a seconda delle condizioni di taglio, della profondità di taglio e della rigidità della macchina.
3. Utilizzare dei lubrificanti di taglio adeguati, dotati di un elevato coefficiente di rallentamento di emissione del fumo.
4. Per la fresatura di acciai inossidabili o acciai legati resistenti alle alte temperature (es. Inconel) è consigliato l'utilizzo di lubrificanti non solubili in acqua.
5. Per la lavorazione a secco, utilizzate un getto d'aria compressa per evitare un ingorgo di trucioli.

1. Utilisez une machine et un porte-outil de grande rigidité et de haute précision.
2. Réglez les vitesses et les avances d'après les conditions de coupe, la profondeur de coupe et la rigidité de la machine.
3. Utilisez des lubrificants de coupe adéquats, dotés d'un coef. élevé de ralentissement d'émission de fumée.
4. Pour le fraisage d'aciers inoxydables ou d'alliages d'acier résistant aux hautes températures (ex. Inconel) il est recommandé d'employer des lubrificants non solubles dans l'eau.
5. Pour l'usinage à sec, utilisez un jet d'air comprimé pour éviter un bourrage de copeaux.

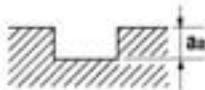
## Conditions - Schnittwerte - Condizioni - Conditions

Slotting - Nutenfräsen -

FX-MG-EHS - FX-CR-MG-EHS

Per scanalature profonde - Rainurage



	Work material Werkstoff Materiale Matière à usiner	C≤0,2% - GG		SCM - SKD		30~38 HRC		38~45 HRC - SUS		45~55 HRC - HRS		55~60 HRC			
		S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)		
3 flutes - 3 Schneiden - 3 lèvres 4 flutes - 4 Schneiden - 4 lèvres	Ø														
	3	8.900	665	6.650	595	5.900	350	3.800	90	3.150	55	2.000	30		
	4	6.650	695	5.000	675	4.450	400	2.850	100	2.350	70	1.550	35		
	5	5.300	715	4.000	660	3.550	360	2.250	105	1.900	70	1.250	35		
	6	4.450	740	3.300	550	2.950	345	1.900	110	1.550	70	1.050	35		
	8	3.300	660	2.500	500	2.200	360	1.400	115	1.150	75	795	35		
	10	2.650	630	2.000	475	1.750	325	1.100	115	955	75	635	35		
	12	2.200	590	1.650	440	1.450	300	955	110	795	75	530	35		
	14	1.900	560	1.400	445	1.250	270	815	95	680	70	455	30		
	16	1.650	525	1.250	400	1.100	245	715	85	595	65	395	25		
	18	1.450	480	1.100	365	990	225	635	80	530	60	350	25		
20	1.300	450	1.000	345	890	205	570	75	475	55	315	25			
25	1.050	395	800	300	710	170	455	60	380	50	255	25			
	Max. cutting depth Maximale Schnitttiefe Profondità di taglio Profondeur de coupe	$a_p = 0,5D$												$a_p = 0,05D$	

1. Use high precision machine set up to ensure maximum rigidity.
2. Set up speed & feed in accordance with with cutting conditions and and a high rigidity machine set up.
3. Use a coolant that has a low co-efficient of smoke emission.
4. For stainless steels & heat resisting steels, non-water soluble coolant is highly recommended.
5. For dry milling, use compressed air to aid chip clearance.

1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spanmittel.
2. Bitte regulieren Sie Schnittgeschwindigkeit, Vorschub und Spantiefe entsprechend Ihrer aktuellen Zerspanungsbedingen.
3. Bitte geeignetes Kühlmedium mit rauchhemmenden Zusätzen verwenden.
4. Für VA und gehärterter Stahl, empfehlen wir keine wasserlöslichen Kühlmittel.
5. Bei Trockenbearbeitung Druckluft zum Entfernen der Späne verwenden.

1. Utilizzare una macchina e un mandrino di elevata rigidità e di alta precisione.
2. Regolare la velocità e gli avanzamenti a seconda delle condizioni di taglio, della profondità di taglio e della rigidità della macchina.
3. Utilizzare dei lubrificanti di taglio adeguati, dotati di un elevato coefficiente di rallentamento di emissione del fumo.
4. Per la fresatura di acciai inossidabili o acciai legati resistenti alle alte temperature (es. Inconel) è consigliato l'utilizzo di lubrificanti non solubili in acqua.
5. Per la lavorazione a secco, utilizzate un getto d'aria compressa per evitare un ingorgo di trucioli.

1. Utilisez une machine et un porte-outil de grande rigidité et de haute précision.
2. Réglez les vitesses et les avances d'après les conditions de coupe, la profondeur de coupe et la rigidité de la machine.
3. Utiliser des lubrifiants de coupe adéquats, dotés d'un coef. élevé de ralentissement d'émission de fumée.
4. Pour le fraisage d'aciers inoxydables ou d'alliages d'acier résistant aux hautes températures (ex. Inconel) il est recommandé d'employer des lubrifiants non solubles dans l'eau.
5. Pour l'usinage à sec, utilisez un jet d'air comprimé pour éviter un bourrage de copeaux.

FX

## Conditions - Schnittwerte - Condizioni - Conditions



FX-MG-REE

Side milling - Konturfräsen -  
Conturnatura - Contournage

Work material Werkstoff Materiale Matière à usiner	GG		C≤0,2%		SCM - SKD		30~38 HRC		38~45 HRC - SUS	
	GG-GGG		S55C-SS400 ~750N/mm <sup>2</sup>		SKD-SKS-SNCM ~30 HRC		NAK55-HPMI-SKT 30~38 HRC		SUS304·X210CR12· X40CRMOV51 38~45 HRC	
Ø	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
6	4.200	585	4.200	585	3.700	370	2.900	230	2.650	210
8	3.150	565	3.150	565	2.750	350	2.150	230	1.950	210
10	2.500	500	2.500	500	2.200	350	1.750	230	1.550	210
12	2.100	500	2.100	500	1.850	330	1.450	230	1.300	210
14	1.800	450	1.800	450	1.550	325	1.250	230	1.100	210
16	1.550	400	1.550	400	1.350	320	1.050	230	995	210
18	1.400	390	1.400	390	1.200	320	970	240	880	220
20	1.250	375	1.250	375	1.100	320	875	240	795	220
21	1.150	350	1.150	350	985	310	835	240	760	220
22	1.010	320	1.010	320	940	300	800	240	720	220
23	970	320	970	320	900	300	760	240	690	220
24	900	310	900	310	860	300	730	240	660	220
25	870	300	870	300	830	295	640	220	575	200
30	585	235	585	235	560	225	480	190	425	170

Max. cutting depth  
Maximale Schnitttiefe  
Profondità di taglio  
Profondeur de coupe

Ø 6	Ø 8
1.50	0.30

1. Use a rigid and precise machine and holder.
2. When chattering occurs, reduce the speed and feed simultaneously.
3. Use a suitable cutting fluid with high smoke retardant properties.

1. Utilizzare una macchina ed un mandrino di elevata rigidità e di alta precisione.
2. In caso di vibrazione, ridurre simultaneamente la velocità di taglio e l'avanzamento.
3. Utilizzare dei lubrificanti di taglio adeguati, dotati di un elevato coefficiente di rallentamento di emissione del fumo.

1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spanmittel.
2. Falls Vibrationen auftreten sollten, Vorschub und Schnittgeschwindigkeit reduzieren.
3. Benutzen Sie Kühlmittel mit rauchemenden Zusätzen.

1. Utiliser une machine et un porte-outil de grande rigidité et de haute précision.
2. En cas de vibrations, réduisez, simultanément, la vitesse de coupe et l'avance.
3. Utiliser des fluides de coupes de haute qualité avec un coef. élevé de ralentissement d'émission de fumée.

FX

FX-MG-REE

Slotting - Nutenfräsen -  
Per scanalature profonde - Rainurage

Work material Werkstoff Materiale Matière à usiner	GG		C≤0,2%		SCM - SKD		30~38 HRC		38~45 HRC - SUS	
	GG-GGG		S55C-SS400 ~750N/mm <sup>2</sup>		SKD-SKS-SNCM ~30 HRC		NAK55-HPMI-SKT 30~38 HRC		SUS304·X210CR12· X40CRMOV51 38~45 HRC	
Ø	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
6	3.150	315	3.150	315	2.650	265	2.300	180	2.100	165
8	2.350	300	2.350	300	1.950	250	1.750	175	1.550	155
10	1.900	300	1.900	300	1.550	245	1.400	165	1.250	150
12	1.550	280	1.550	280	1.300	235	1.150	160	1.050	145
14	1.350	280	1.350	280	1.100	235	1.000	150	905	135
16	1.150	280	1.150	280	995	235	875	140	795	125
18	1.050	280	1.050	280	880	235	775	140	705	125
20	955	280	955	280	795	235	700	140	635	125
21	910	280	910	280	760	235	670	140	610	125
22	870	280	870	280	720	235	640	140	580	125
23	760	250	760	250	690	235	610	140	560	125
24	730	245	730	245	660	225	585	140	530	125
25	700	245	700	245	640	225	510	125	460	115
30	530	210	530	210	480	190	425	125	380	115

Max. cutting depth  
Maximale Schnitttiefe  
Profondità di taglio  
Profondeur de coupe

Ø 6 ≤ Ø < Ø 16	a <sub>a</sub>
Ø 16 ≤ Ø	10
	0.50

1. Use a rigid and precise machine and holder.
2. When chattering occurs, reduce the speed and feed simultaneously.
3. Use a suitable cutting fluid with high smoke retardant properties.

1. Utilizzare una macchina ed un mandrino di elevata rigidità e di alta precisione.
2. In caso di vibrazione, ridurre simultaneamente la velocità di taglio e l'avanzamento.
3. Utilizzare dei lubrificanti di taglio adeguati, dotati di un elevato coefficiente di rallentamento di emissione del fumo.

1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spanmittel.
2. Falls Vibrationen auftreten sollten, Vorschub und Schnittgeschwindigkeit reduzieren.
3. Benutzen Sie Kühlmittel mit rauchemenden Zusätzen.

1. Utiliser une machine et un porte-outil de grande rigidité et de haute précision.
2. En cas de vibrations, réduisez, simultanément, la vitesse de coupe et l'avance.
3. Utiliser des fluides de coupes de haute qualité avec un coef. élevé de ralentissement d'émission de fumée.

## Conditions - Schnittwerte - Condizioni - Conditions

High speed milling - HSC Schlichtfräsen -  
Fresatura alta velocità - Fraisage UGV

FX-MG-EBD-3



Work material Werkstoff Materiale Matière à usiner	GG		C≤0,2%		SCM - SKD		30~38 HRC		38~45 HRC - SUS		45~55 HRC - HRS		55~60 HRC	
	GG-GGG		S55C-SS400 ~750N/mm <sup>2</sup>		SKD-SKS-SNCM ~30 HRC		NAK55-HPMI-SKT 30~38 HRC		SUS304- X210CR12- X40CRMOV51 38~45 HRC		45~55 HRC		55~60 HRC	
∅	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
R 0.2 X 0.4	32.000	460	32.000	460	32.000	410	32.000	330	32.000	205	24.500	135	24.500	115
R 0.3 X 0.6	32.000	535	32.000	535	31.500	490	32.000	420	32.000	265	24.500	175	23.500	150
R 0.4 X 0.8	32.000	610	32.000	610	31.500	550	32.000	460	27.500	285	23.500	210	17.500	140
R 0.5 X 1	32.000	765	32.000	765	31.500	630	25.000	400	22.000	285	19.000	210	14.000	140
R 0.6 X 1.2	32.000	765	31.500	755	26.500	635	21.000	400	18.500	285	15.500	210	11.500	140
R 0.7 X 1.4	32.000	895	27.000	755	22.500	630	18.000	400	15.500	285	13.500	210	10.000	140
R 0.8 X 1.6	29.500	940	23.500	755	19.500	630	15.500	400	13.500	285	11.500	210	8.950	140
R 0.9 X 1.8	26.500	950	21.000	755	17.500	630	14.000	400	12.000	285	10.500	210	7.950	140
R 1 X 2	23.500	945	19.000	755	15.500	620	12.500	400	11.000	285	9.500	210	7.150	140
R 1.1 X 2.2	21.500	945	17.000	755	14.000	620	11.500	400	10.000	285	8.650	210	6.500	140
R 1.2 X 2.4	19.500	935	15.500	755	13.000	620	10.500	400	9.250	285	7.950	210	5.950	140
R 1.3 X 2.6	18.000	935	14.500	755	12.000	620	9.750	400	8.550	285	7.300	210	5.500	140
R 1.4 X 2.8	17.000	935	13.500	755	11.000	620	9.050	400	7.950	285	6.800	210	5.100	140
R 1.5 X 3	15.500	930	12.500	750	10.500	620	8.450	400	7.400	280	6.350	210	4.750	140

Max. cutting depth Maximale Schnitttiefe Profondità di taglio Profondeur de coupe	R < 0.5	0.05D	0.2D
	0.5 ≤ R	0.1D	0.2D

a	pf
0.05D	0.1D

1. Use highest possible speed.
2. On lower speed machines, use maximum speed & feed settings.
3. Cutter mis-alignment must not exceed 10μ.
4. Always use coolant

1. Maximale Geschwindigkeit benutzen.
2. Bei konventionellen Maschinen, maximale Drehzahl-verwenden und den Vorschub entsprechend anpassen.
3. Fräserrundlauf darf max. 0.01 mm betragen.
4. Immer Kühlmittel benutzen.

1. Utilizza la velocità più alta possibile.
2. Quando utilizzate delle macchine di basse velocità, utilizzate la velocità più alta e regolatevi il passo di avanzamento.
3. Dopo il suo passaggio nel mandrino, la fresa non può avere un run-out superiore a 0.01 mm.
4. Utilizzare sempre dei liquidi da taglio.

1. Utilisez la vitesse la plus élevée possible.
2. Lorsque vous employez des machines de basses vitesses, utilisez la vitesse la plus haute et ajustez-y le taux d'avance.
3. Après sa fixation dans le porte-outil, la fraise ne peut avoir un faux rond supérieur à 10μ.
4. Utiliser toujours des fluides de coupe

FX

High speed milling - HSC Schlichtfräsen -  
Fresatura alta velocità - Fraisage UGV

FX-HO-MG-EBD

Work material Werkstoff Materiale Matière à usiner	GG		C≤0,2%		SCM - SKD		30~38 HRC		38~45 HRC - SUS		45~55 HRC - HRS		55~60 HRC	
	GG-GGG		S55C-SS400 ~750N/mm <sup>2</sup>		SKD-SKS-SNCM ~30 HRC		NAK55-HPMI-SKT 30~38 HRC		SUS304- X210CR12- X40CRMOV51 38~45 HRC		45~55 HRC		55~60 HRC	
∅	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
R 3 X 6	21.000	6.700	17.500	5.600	15.500	4.950	14.500	3.450	14.500	3.450	11.000	2.600	7.950	1.350
R 4 X 8	15.500	4.950	13.000	4.150	11.500	3.650	11.000	2.600	11.000	2.600	8.350	2.000	5.950	1.050
R 5 X 10	12.500	4.000	10.500	3.350	9.500	3.000	8.900	2.100	8.900	2.100	6.650	1.550	4.750	855
R 6 X 12	10.500	3.350	8.750	2.800	7.950	2.500	7.400	1.750	7.400	1.750	5.550	1.300	3.950	710
R 8 X 16	7.950	2.500	6.550	2.050	5.950	1.900	5.550	1.300	5.550	1.300	4.150	995	2.950	530
R 10 X 20	6.350	2.000	5.250	1.650	4.750	1.500	4.450	1.050	4.450	1.050	3.300	790	2.350	420

Max. cutting depth Maximale Schnitttiefe Profondità di taglio Profondeur de coupe	a	pf
	0.02D	0.05D

3 ≤ D ≤ 8	a	pf
	0.02D	0.05D
8 < D	0.32 mm	0.05D

Attention : sparks and/or flames can cause coolant fire. Be sure adequate fire prevention is available.

1. Speeds and feeds are designed to be used in conjunction with small passes on a high speed & precision machine set-up.
2. Do not use inflammable coolant. Using worn tools may generate sparks.
3. Use compressed air or a high quality coolant with a low co-efficient of smoke emission.

Achtung: Funken und/oder Flammen können den Kühlschmierstoff entzünden. stellen Sie einen ausreichenden Brandschutz sicher.

1. Die Schnittdaten sind ausgelegt für geringe Zustellungen in Verbindung mit HSC tauglichen Maschinen und Spanmittel.
2. Bitte geeignetes Kühlmittel mit rauchhemmenden Zusätzen verwenden.
3. Benutzen Sie Druckluft oder Kühlmittel mit rauchhemmenden Zusätzen.

Attenzione: le scintille prodotte durante l'operazione o il calore causato dalla rottura dell'utensile possono infiammare il lubrificante. Assicurarsi che siano applicate delle adeguate misure di prevenzione.

1. Queste velocità e questi avanzamenti sono indicati per fresatura di piccole passate ad alta velocità e centri di lavorazione di alta precisione.
2. Non utilizzare lubrificanti da taglio infiammabili; gli utensili troppo usurati possono produrre scintille.
3. Utilizzare un getto di aria compressa. Se la vostra scelta ricade su dei liquidi da taglio, sceglierli di alta qualità, dotati di un coefficiente elevato di rallentamento d'emissione del fumo.

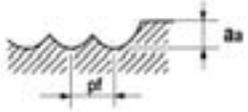
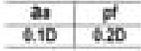
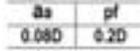
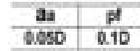
Attention : étincelles et/ou chaleur peuvent enflammer le lubrifiant. S'assurer que des mesures de prévention adéquates sont appliquées.

1. Les vitesses et avances sont indiquées pour le fraisage de petites passes à haute vitesse / centres d'usinage de haute précision.
2. Ne pas utiliser de lubrifiants de coupe inflammables, les outils fortement usés peuvent produire des étincelles.
3. Utilisez un jet d'air comprimé ou des fluides de coupe de haute qualité avec un coef. élevé de ralentissement d'émission de fumée.

## Conditions - Schnittwerte - Condizioni - Conditions

## FX-HS-EBDS

High speed milling roughing - HSC Schlichtfräsen schruppen -  
Fresatura alta velocità sgrossatura - Fraisage UGV ébauche

Work material Werkstoff Materiale Matière à usiner	C≤0,2% - GG		30~38 HRC		38~45 HRC		45~55 HRC		55~60 HRC		60~65 HRC		65~70 HRC	
	S55C•SS400•GG25 ~750N/mm		30~38 HRC		38~45 HRC		45~55 HRC		55~60 HRC		60~65 HRC		65~70 HRC	
∅	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
R1.5	33.400	4.610	32.400	4.470	31.800	3.630	26.500	2.860	20.200	1.940	18.000	1.570	12.700	1.110
R2	25.100	4.410	24.300	4.270	23.900	3.530	19.900	2.710	15.100	1.870	13.500	1.520	9.550	1.070
R2.5	20.100	4.210	19.400	4.080	19.100	3.340	15.900	2.550	12.100	1.810	10.800	1.460	7.640	1.030
R3	16.700	3.810	16.180	3.690	15.900	3.250	13.300	2.390	10.100	1.690	9.020	1.410	6.370	995
R4	12.500	3.710	12.100	3.590	11.900	3.150	9.950	2.310	7.560	1.630	6.760	1.350	4.770	955
R5	10.000	3.610	9.710	3.500	9.550	3.060	7.960	2.230	6.050	1.570	5.410	1.300	3.820	915
R6	8.360	3.340	8.090	3.240	7.960	2.670	6.630	2.070	5.040	1.450	4.510	1.080	3.180	765
Max. cutting depth Maximale Schnitttiefe Profondità di taglio Profondeur de coupe														

1. Use high precision machine set up to ensure maximum rigidity.
2. Use a coolant that has a low co-efficient of smoke emission.

1. Utilizzare una macchina e un mandrino di elevata rigidità e di alta precisione.
2. Utilizzare dei lubrificanti di taglio adeguati, dotati di un elevato coefficiente di rallentamento di emissione del fumo.

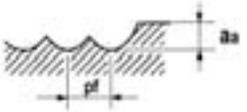
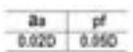
1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spanmittel.
2. Bitte geeignetes Kühlmedium mit rauchhemmenden Zusätzen verwenden.

1. Utilisez une machine et un porte-outil de grande rigidité et de haute précision.
2. Utilisez des lubrifiants de coupe adéquats, dotés d'un coef. élevé de ralentissement

## FX

## FX-HS-EBDS

High speed milling finishing - HSC Schlichtfräsen schlichten -  
Fresatura alta velocità sgrossatura e finitura - Fraisage UGV finition

Work material Werkstoff Materiale Matière à usiner	C≤0,2% - GG		30~38 HRC		38~45 HRC		30~38 HRC - HRS		55~60 HRC		60~65 HRC		65~70 HRC	
	S55C•SS400•GG25 ~750N/mm		30~38 HRC		38~45 HRC		45~55 HRC		55~60 HRC		60~65 HRC		65~70 HRC	
∅	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
R1.5	36.100	5.840	34.000	5.300	32.900	4.930	27.600	4.140	22.300	3.070	20.100	2.420	13.800	1.490
R2	27.100	5.410	25.500	4.890	24.700	4.540	20.700	3.810	16.700	2.810	15.100	2.180	10.300	1.410
R2.5	21.600	5.190	20.400	4.690	19.700	4.340	16.500	3.390	13.400	2.540	12.100	2.060	8.280	1.320
R3	18.000	1.980	17.000	4.480	16.400	4.140	13.800	3.140	11.100	2.270	10.100	1.940	6.900	1.240
R4	13.500	4.330	12.700	4.070	12.300	3.550	10.300	2.650	8.360	2.010	7.560	1.690	5.170	1.080
R5	10.800	3.900	10.200	3.670	9.870	3.160	8.280	2.320	6.680	1.740	6.050	1.450	4.140	995
R6	9.020	3.610	8.490	3.400	7.980	2.870	6.900	2.150	5.570	1.600	5.040	1.210	3.450	830
Max. cutting depth Maximale Schnitttiefe Profondità di taglio Profondeur de coupe														

1. Use high precision machine set up to ensure maximum rigidity.
2. Use a coolant that has a low co-efficient of smoke emission.

1. Utilizzare una macchina e un mandrino di elevata rigidità e di alta precisione.
2. Utilizzare dei lubrificanti di taglio adeguati, dotati di un elevato coefficiente di rallentamento di emissione del fumo.

1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spanmittel.
2. Bitte geeignetes Kühlmedium mit rauchhemmenden Zusätzen verwenden.

1. Utilisez une machine et un porte-outil de grande rigidité et de haute précision.
2. Utilisez des lubrifiants de coupe adéquats, dotés d'un coef. élevé de ralentissement

## Conditions - Schnittwerte - Condizioni - Conditions

FX-RB-EBD



Work material Werkstoff Materiale Matière à usiner	C≤0,2% - GG S55C-St44-FC250 ~750N/mm <sup>2</sup>			SCM - SKD SKD-SKS-SNCM ~30 HRC			30~38 HRC NAK55-HPMI-SKT 30~38 HRC		
	S. (min <sup>-1</sup> )	F. (mm/min)	a <sub>a</sub>	S. (min <sup>-1</sup> )	F. (mm/min)	a <sub>a</sub>	S. (min <sup>-1</sup> )	F. (mm/min)	a <sub>a</sub>
<b>R 0.3</b>	28.500 ~32.000	230	0.012~0.03	28.500 ~32.000	225	0.012~0.03	28.500 ~32.000	175	0.012~0.03
<b>R 0.4</b>	28.500 ~32.000	270~460	0.016~0.04	23.500 ~31.500	225~450	0.016~0.04	22.000 ~28.500	175~325	0.016~0.04
<b>R 0.5</b>	22.500 ~30.500	270~540	0.05 ~0.1	19.000 ~25.000	225~450	0.05 ~0.1	17.500 ~22.500	175~325	0.05 ~0.1
<b>R 0.6</b>	19.000 ~25.000	270~540	0.06 ~0.12	15.500 ~21.000	225~450	0.06 ~0.12	14.500 ~19.000	175~325	0.06 ~0.12
<b>R 0.7</b>	16.000 ~22.000	270~540	0.07 ~0.14	13.500 ~18.000	225~450	0.07 ~0.14	12.500 ~16.000	175~325	0.07 ~0.14
<b>R 0.75</b>	15.000 ~20.000	270~540	0.075~0.15	12.500 ~16.500	225~450	0.075~0.15	11.500 ~15.000	175~325	0.075~0.15
<b>R 0.8</b>	14.000 ~19.000	270~540	0.08 ~0.16	11.500 ~16.000	225~450	0.08 ~0.16	11.000 ~14.000	175~325	0.08 ~0.16
<b>R 0.9</b>	12.500 ~17.000	270~540	0.09 ~0.18	10.500 ~14.000	225~450	0.09 ~0.18	9.900 ~13.000	175~325	0.09 ~0.18
<b>R 1</b>	11.000 ~15.000	270~540	0.1 ~0.2	9.500 ~12.500	225~450	0.1 ~0.2	8.900 ~11.000	175~325	0.1 ~0.2
<b>R 1.5</b>	7.600 ~10.000	270~540	0.15 ~0.3	6.350 ~ 8.450	225~450	0.15 ~0.3	6.000 ~ 7.600	175~325	0.15 ~0.3
<b>R 2</b>	5.700 ~ 7.600	270~540	0.2 ~0.4	4.800 ~ 6.350	225~450	0.2 ~0.4	4.400 ~ 5.700	175~325	0.2 ~0.4
Max. cutting depth Maximale Schnitttiefe Profondità di taglio Profondeur de coupe									

Work material Werkstoff Materiale Matière à usiner	38~45 HRC SUS304+ X210CR12+ X40CRMV51 38~45 HRC			45~55 HRC - HRS 45~55 HRC			55~60 HRC NAK55-HPMI-SKT 55~60 HRC		
	S. (min <sup>-1</sup> )	F. (mm/min)	a <sub>a</sub>	S. (min <sup>-1</sup> )	F. (mm/min)	a <sub>a</sub>	S. (min <sup>-1</sup> )	F. (mm/min)	a <sub>a</sub>
<b>R 0.3</b>	26.000 ~30.000	125	0.012~0.03	22.000 ~30.000	90	0.006~0.012	18.500 ~21.000	55	0.006
<b>R 0.4</b>	19.500 ~25.000	125~240	0.016~0.04	16.500 ~23.000	90~180	0.008~0.016	12.500 ~15.500	60~100	0.008
<b>R 0.5</b>	15.500 ~20.000	125~240	0.05 ~0.1	13.000 ~18.000	90~180	0.01 ~0.02	10.000 ~12.500	60~100	0.01 ~0.02
<b>R 0.6</b>	13.000 ~16.500	125~240	0.06 ~0.12	11.000 ~15.000	90~180	0.012~0.024	8.450 ~10.500	60~100	0.012~0.024
<b>R 0.7</b>	11.000 ~14.000	125~240	0.07 ~0.14	9.500 ~13.000	90~180	0.014~0.028	7.250 ~ 9.000	60~100	0.014~0.028
<b>R 0.75</b>	10.500 ~13.000	125~240	0.075~0.15	8.900 ~12.000	90~180	0.015~0.03	6.750 ~ 8.450	60~100	0.015~0.03
<b>R 0.8</b>	9.900 ~12.500	125~240	0.08 ~0.16	8.350 ~11.500	90~180	0.016~0.032	6.350 ~ 8.000	260~100	0.016~0.032
<b>R 0.9</b>	8.800 ~11.000	125~240	0.09 ~0.18	7.400 ~10.500	90~180	0.018~0.036	5.650 ~ 7.000	60~100	0.018~0.036
<b>R 1</b>	7.950 ~10.000	125~240	0.1 ~0.2	6.650 ~ 9.200	90~180	0.02 ~0.04	5.050 ~ 6.350	60~100	0.02 ~0.04
<b>R 1.5</b>	5.300 ~ 6.650	125~240	0.15 ~0.3	4.500 ~ 6.150	90~180	0.03 ~0.06	3.400 ~ 4.200	60~100	0.03 ~0.06
<b>R 2</b>	4.000 ~ 5.000	125~240	0.2 ~0.4	3.300 ~ 4.600	90~180	0.04 ~0.08	2.500 ~ 3.150	60~100	0.04 ~0.08
Max. cutting depth Maximale Schnitttiefe Profondità di taglio Profondeur de coupe									

1. When using conventional speed machine, work to max. possible speed and adjust feed accordingly.
2. Cutter mis-alignment must not exceed 10 $\mu$ .
3. Use coolant.

1. Bei konventionellen Maschinen bitte größtmögliche Drehzahl auswählen und den Vorschub entsprechend anpassen.
2. Fräser-Rundlauffehler sollte max. 10 $\mu$  betragen.
3. Verwenden Sie Kühlmittel.

1. Quando si usa una macchina convenzionale, lavorare al massimo della velocità possibile e regolare l'avanzamento di conseguenza.
2. Una fresa disallineata non deve superare i10 $\mu$ .
3. Utilizzare dei lubrificanti di taglio adeguati, dotati di un elevato coefficiente di rallentamento di emissione del fumo.

1. Si la machine utilise des vitesses conventionnelles, veuillez choisir le max. de la capacité et ajuster l'avance en conséquence.
2. Le faux rond de la fraise ne peut excéder 10  $\mu$ m après fixation dans le mandrin.
3. Utilisez un lubrifiant.

FX

## Conditions - Schnittwerte - Condizioni - Conditions

FX-EBD-6

High speed milling - HSC Schlichtfräsen -  
Fresatura alta velocità - Fraisage UGV

Work material Werkstoff Materiale Matière à usiner	C≤0,2%		SCM - SKD		30~38 HRC		38~45 HRC - SUS		45~55 HRC - HRS		55~60 HRC					
	S55C•SS400 ~750N/mm <sup>2</sup>		SKD•SKS•SNCM ~30 HRC		NAK55•HPMI•SKT 30~38 HRC		SUS304• X210CR12• X40CRMV51 38~45 HRC		38~45 HRC		55~60 HRC					
Ø	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)				
R0.1	50.000	640	50.000	560	50.000	560	50.000	480	32.000	290	32.000	290				
R0.15	50.000	930	50.000	840	50.000	720	50.000	720	32.000	440	32.000	440				
R0.2	50.000	1.200	50.000	1.100	50.000	1.100	50.000	960	32.000	585	32.000	585				
R0.25	50.000	1.450	50.000	1.400	50.000	1.400	50.000	1.200	32.000	735	32.000	735				
R0.3	50.000	1.650	50.000	1.650	50.000	1.650	50.000	1.400	32.000	880	32.000	880				
R0.4	50.000	2.200	50.000	2.200	50.000	2.000	50.000	1.900	32.000	1.150	32.000	1.150				
R0.5	50.000	2.800	50.000	2.800	50.000	2.500	50.000	2.400	38.000	1.700	32.000	1.450				
R0.75	50.000	4.200	50.000	4.200	46.500	3.450	46.500	3.300	28.500	1.700	26.500	1.800				
R1	44.500	4.950	41.000	4.550	35.000	3.500	35.000	3.350	25.000	2.600	19.500	1.800				
R1.5	29.500	4.950	27.500	4.600	23.000	3.500	23.000	3.350	19.000	2.600	13.000	1.800				
R2	22.000	4.900	20.500	4.600	17.500	3.500	17.500	3.350	14.000	2.600	9.900	1.800				
R2.5	17.500	4.900	16.500	4.600	14.000	3.500	14.000	3.350	11.000	2.600	7.950	1.800				
R3	14.500	4.850	13.500	4.500	11.500	3.450	11.500	3.300	9.500	2.600	6.600	1.800				
Max. cutting depth Maximale Schnitttiefe Profondità di taglio Profondeur de coupe	 <table border="1" data-bbox="388 1108 536 1198"> <tr> <td>ap</td> <td>pf</td> </tr> <tr> <td>0.02D</td> <td>0.05D</td> </tr> </table>												ap	pf	0.02D	0.05D
ap	pf															
0.02D	0.05D															

Attention : sparks and/or flames can cause coolant fire. Be sure adequate fire prevention is available.

- Speeds and feeds are designed to be used in conjunction with small passes on a high speed & precision machine set-up.
- Do not use inflammable coolant. Using worn tools may generate sparks.
- Use compressed air or a high quality coolant with a low co-efficient of smoke emission.

Achtung: Funken und/oder Flammen können den Kühlschmierstoff entzünden. Stellen Sie einen ausreichenden Brandschutz sicher.

- Die Schnittdaten sind ausgelegt für geringe Zustellungen in Verbindung mit HSC tauglichen Maschinen und Spanmitteln.
- Bitte geeignetes Kühlmittel mit rauchhemmenden Zusätzen verwenden.
- Benutzen Sie Druckluft oder Kühlmittel mit rauchhemmenden Zusätzen.

Attenzione: le scintille prodotte durante l'operazione o il calore causato dalla rottura dell'utensile possono infiammare il lubrificante. Assicurarsi che siano applicate delle adeguate misure di prevenzione.

- Queste velocità e questi avanzamenti sono indicati per fresatura di piccole passate ad alta velocità e centri di lavorazione di alta precisione.
- Non utilizzare lubrificanti da taglio infiammabili; gli utensili troppo usurati possono produrre scintille.
- Utilizzare un getto di aria compressa. Se la vostra scelta ricade su dei liquidi da taglio, sceglierli di alta qualità, dotati di un coefficiente elevato di rallentamento d'emissione del fumo.

Attention : étincelles et/ou chaleur peuvent enflammer le lubrifiant. S'assurer que des mesures de prévention adéquates sont appliquées.

- Les vitesses et avances sont indiquées pour le fraisage de petites passes à haute vitesse / centres d'usinage de haute précision.
- Ne pas utiliser de lubrifiants de coupe inflammables, les outils fortement usés peuvent produire des étincelles.
- Utilisez un jet d'air comprimé ou des fluides de coupe de haute qualité avec un coef. éle-

FX

## Conditions - Schnittwerte - Condizioni - Conditions

FX-PC-MG-EBD



Work material Werkstoff Materiale Matière à usiner	GG		C≤0,2%		SCM - SKD		30~38 HRC	
	GG-GGG		S55C-SS400 ~750N/mm <sup>2</sup>		SKD-SKS-SNCM ~30 HRC		X210CR12• X40CRMOV51 38~45 HRC	
Ø	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
R 0.5 X 1	32.000	410~ 610	25.000~ 32.000	360~ 610	25.000~ 31.500	300~ 500	20.000~ 25.000	190~ 320
R 1 X 2	19.000~ 23.500	410~ 675	15.500~ 19.000	370~ 610	12.500~ 15.500	300~ 500	10.000~ 12.500	190~ 320
R 1.5 X 3	12.500~ 15.500	450~ 710	10.500~ 12.500	375~ 610	8.450~ 10.500	300~ 500	6.750~ 8.450	190~ 320
R 2 X 4	9.500~ 11.500	450~ 725	7.950~ 9.500	380~ 610	6.350~ 7.950	300~ 505	5.050~ 6.350	210~ 355
R 2.5 X 5	7.600~ 9.500	510~ 850	6.350~ 7.600	425~ 680	5.050~ 6.350	300~ 505	4.050~ 5.050	215~ 360
R 3 X 6	6.350~ 7.950	510~ 850	5.300~ 6.350	425~ 680	4.200~ 5.300	315~ 535	3.350~ 4.200	215~ 365
R 4 X 8	4.750~ 5.950	640~ 1.050	3.950~ 4.750	510~ 820	3.150~ 3.950	375~ 630	2.500~ 3.150	265~ 445
R 5 X 10	3.800~ 4.750	575~ 960	3.150~ 3.800	475~ 770	2.500~ 3.150	355~ 595	2.000~ 2.500	250~ 420
R 6 X 12	3.150~ 3.950	540~ 900	2.650~ 3.150	450~ 710	2.100~ 2.650	330~ 560	1.650~ 2.100	230~ 395

Max. cutting depth  
Maximale Schnitttiefe  
Profondità di taglio  
Profondeur de coupe

Work material Werkstoff Materiale Matière à usiner	30~38 HRC - SUS		45~55 HRC - HRS		55~60 HRC	
	SUS304• X210CR12• X40CRMOV51 38~45 HRC		45~55 HRC		55~60 HRC	
Ø	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
R 0.5 X 1	14.500~ 22.000	110~ 225	14.500~ 19.000	95~ 170	11.000~ 14.000	65~ 110
R 1 X 2	8.900~ 11.000	140~ 235	7.600~ 9.500	100~ 170	5.700~ 7.150	65~ 110
R 1.5 X 3	5.900~ 7.400	140~ 235	5.050~ 6.350	100~ 170	3.800~ 4.750	65~ 110
R 2 X 4	4.450~ 5.550	175~ 295	3.800~ 4.750	130~ 215	2.850~ 3.550	85~ 140
R 2.5 X 5	3.550~ 4.450	175~ 295	3.050~ 3.800	135~ 230	2.250~ 2.850	85~ 140
R 3 X 6	2.950~ 3.700	185~ 310	2.500~ 3.150	140~ 235	1.900~ 2.350	90~ 145
R 4 X 8	2.200~ 2.750	215~ 360	1.900~ 2.350	160~ 260	1.400~ 1.750	100~ 165
R 5 X 10	1.750~ 2.200	205~ 345	1.500~ 1.900	160~ 270	1.100~ 1.400	100~ 170
R 6 X 12	1.450~ 1.850	190~ 330	1.250~ 1.550	150~ 245	955~ 1.150	95~ 155

Max. cutting depth  
Maximale Schnitttiefe  
Profondità di taglio  
Profondeur de coupe

1. Use a rigid and precise machine and holder.
2. When chattering occurs, reduce the speed and feed simultaneously.
3. Use a suitable cutting fluid with high smoke retardant properties.

1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spannmittel.
2. Falls Vibrationen auftreten sollten, Vorschub und Schnittgeschwindigkeit reduzieren.
3. Benutzen Sie Kühlmittel mit rauchemendenden Zusätzen.

1. Utilizzare una macchina ed un mandrino di elevata rigidità e di alta precisione.
2. In caso di vibrazione, ridurre simultaneamente la velocità di taglio e l'avanzamento.
3. Utilizzare dei lubrificanti di taglio adeguati, dotati di un elevato coefficiente di rallentamento di emissione del fumo.

1. Utiliser une machine et un porte-outil de grande rigidité et de haute précision.
2. En cas de vibrations, réduisez, simultanément, la vitesse de coupe et l'avance.
3. Utiliser des fluides de coupes de haute qualité avec un coef. élevé de ralentissement d'émission de fumée.

FX

## Conditions - Schnittwerte - Condizioni - Conditions



## FX-PCL-EBD

Work material Werkstoff Materiale Matière à usiner	GG		C≤0,2%		SCM - SKD		38~45 HRC	
	GG-GGG		S55C•SS400 ~750N/mm <sup>2</sup>		SKD•SKS•SNM ~30 HRC		X210CR12• X40CRMV51 38~45 HRC	
∅	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
R 2 X 4	7.960	370	7.000	340	5.570	260	4.770	200
R 3 X 6	5.300	430	4.240	340	3.710	280	3.180	200
R 4 X 8	3.980	540	3.180	410	2.790	330	2.390	250
R 5 X 10	3.180	480	2.540	380	2.230	320	1.910	240
R 6 X 12	2.650	450	2.120	360	1.860	290	1.590	220

Max. cutting depth  
Maximale Schnitttiefe  
Profondità di taglio  
Profondeur de coupe

Work material Werkstoff Materiale Matière à usiner	38~45 HRC - SUS		45~55 HRC - HRS	
	SUS304• X210CR12• X40CRMV51 38~45 HRC		45~55 HRC	
∅	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
R 2 X 4	3.180	125	2.390	80
R 3 X 6	2.120	130	1.590	90
R 4 X 8	1.590	160	1.190	100
R 5 X 10	1.270	150	950	100
R 6 X 12	1.060	140	800	90

Max. cutting depth  
Maximale Schnitttiefe  
Profondità di taglio  
Profondeur de coupe

1. Use a rigid and precise machine and holder.
2. When chattering occurs, reduce the speed and feed simultaneously.
3. Use a suitable cutting fluid with high smoke retardant properties.

1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spanmittel.
2. Falls Vibrationen auftreten sollten, Vorschub und Schnittgeschwindigkeit reduzieren.
3. Benutzen Sie Kühlmittel mit rauchemenden Zusätzen.

1. Utilizzare una macchina ed un mandrino di elevata rigidità e di alta precisione.
2. In caso di vibrazione, ridurre simultaneamente la velocità di taglio e l'avanzamento.
3. Utilizzare dei lubrificanti di taglio adeguati, dotati di un elevato coefficiente di rallentamento di emissione del fumo.

1. Utiliser une machine et un porte-outil de grande rigidité et de haute précision.
2. En cas de vibrations, réduisez, simultanément, la vitesse de coupe et l'avance.
3. Utiliser des fluides de coupes de haute qualité avec un coef. élevé de ralentissement d'émission de fumée.

## Conditions - Schnittwerte - Condizioni - Conditions

Side milling - Konturfräsen -  
Contornatura - Contournage

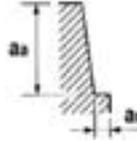
FX-MG-TPDS



Work material Werkstoff Materiale Matière à usiner	GG		C≤0,2%		SCM - SKD		30~38 HRC		38~45 HRC - SUS		45~55 HRC - HRS	
	GG-GGG		S55C•SS400•GG25		SKD•SKS•SNCM ~30 HRC		NAK55•HPMI•SKT 30~38 HRC		SUS304• X210CR12• X40CRM0V51		45~55 HRC	
Ø	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
1	17.500	185	15.500	155	15.500	130	13.000	90	12.000	90	10.500	40
1.5	11.500	185	10.500	155	10.500	130	8.900	90	8.250	90	7.000	40
2	8.900	190	7.950	155	7.950	130	6.650	90	6.200	90	5.250	40
2.5	7.100	190	6.200	145	6.200	125	5.300	90	4.950	90	4.200	40
3	5.900	190	5.150	145	5.150	125	4.450	90	4.100	90	3.500	40
4	4.450	190	3.850	145	3.850	125	3.300	90	3.100	85	2.600	40
5	3.550	190	3.100	145	3.100	125	2.650	90	2.450	85	2.100	40
6	2.950	190	2.600	145	2.600	125	2.200	90	2.050	85	1.750	40
8	2.200	180	1.950	145	1.950	125	1.650	90	1.550	85	1.300	40
10	1.750	175	1.550	145	1.550	120	1.300	90	1.200	85	1.050	40

Max. cutting depth  
Maximale Schnitttiefe  
Profondità di taglio  
Profondeur de coupe

aa ar  
2.50 0.020



1. Use a rigid and precise machine and holder.
2. When chattering occurs, reduce the speed and feed simultaneously.
3. Use a suitable cutting fluid with high smoke retardant properties.

1. Utilizzare una macchina ed un mandrino di elevata rigidità e di alta precisione.
2. In caso di vibrazione, ridurre simultaneamente la velocità di taglio e l'avanzamento.
3. Utilizzare dei lubrificanti di taglio adeguati, dotati di un elevato coefficiente di rallentamento di emissione del fumo.

1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spanmittel.
2. Falls Vibrationen auftreten sollten, Vorschub und Schnittgeschwindigkeit reduzieren.
3. Benutzen Sie Kühlmittel mit rauchemenden Zusätzen.

1. Utiliser une machine et un porte-outil de grande rigidité et de haute précision.
2. En cas de vibrations, réduisez, simultanément, la vitesse de coupe et l'avance.
3. Utiliser des fluides de coupes de haute qualité avec un coef. élevé de ralentissement d'émission de fumée.

Side milling - Konturfräsen -  
Contornatura - Contournage

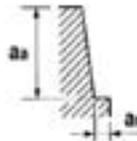
FX-MG-TPMS

FX

Work material Werkstoff Materiale Matière à usiner	GG		C≤0,2%		SCM - SKD		30~38 HRC		38~45 HRC - SUS		45~55 HRC - HRS	
	GG-GGG		S55C•SS400•GG25 ~750N/mm <sup>2</sup>		SKD•SKS•SNCM ~30 HRC		NAK55•HPMI•SKT 30~38 HRC		SUS304• X210CR12• X40CRM0V51 38~45 HRC		45~55 HRC	
Ø	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
3	5.900	310	5.300	225	4.450	225	4.450	180	4.100	130	3.500	130
4	4.450	310	3.950	245	3.300	245	3.300	195	3.100	150	2.600	150
5	3.550	310	3.150	275	2.650	275	2.650	225	2.450	160	2.100	160
6	2.950	310	2.650	275	2.200	275	2.200	225	2.050	175	1.750	175
8	2.200	305	1.950	270	1.650	270	1.650	225	1.550	190	1.300	190
10	1.750	305	1.550	270	1.300	270	1.300	225	1.200	180	1.050	180

Max. cutting depth  
Maximale Schnitttiefe  
Profondità di taglio  
Profondeur de coupe

aa ar  
2.50 0.020



1. Use a rigid and precise machine and holder.
2. When chattering occurs, reduce the speed and feed simultaneously.
3. Use a suitable cutting fluid with high smoke retardant properties.

1. Utilizzare una macchina ed un mandrino di elevata rigidità e di alta precisione.
2. In caso di vibrazione, ridurre simultaneamente la velocità di taglio e l'avanzamento.
3. Utilizzare dei lubrificanti di taglio adeguati, dotati di un elevato coefficiente di rallentamento di emissione del fumo.

1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spanmittel.
2. Falls Vibrationen auftreten sollten, Vorschub und Schnittgeschwindigkeit reduzieren.
3. Benutzen Sie Kühlmittel mit rauchemenden Zusätzen.

1. Utiliser une machine et un porte-outil de grande rigidité et de haute précision.
2. En cas de vibrations, réduisez, simultanément, la vitesse de coupe et l'avance.
3. Utiliser des fluides de coupes de haute qualité avec un coef. élevé de ralentissement d'émission de fumée.

## Conditions - Schnittwerte - Condizioni - Conditions



## CBN-SXB

Work material Werkstoff Materiale Matière à usiner	30~45 HRC		45~55 HRC		55~60 HRC		60~68 HRC	
	SKT · SKD·NAK80·HPM50 30~45 HRC		45~55 HRC		55~60 HRC		60~68 HRC	
Milling speed	300 (m/min)		300 (m/min)		250 (m/min)		200 (m/min)	
R	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
R 2 X 1.2	50.000	2.000	50.000	2.000	50.000	2.000	50.000	2.000
R 3 X 1.8	50.000	2.000	50.000	2.000	50.000	2.000	50.000	2.000
R 5 X 2.5	50.000	3.000	50.000	3.000	50.000	3.000	50.000	3.000
R 1 X 5	50.000	4.000	50.000	4.000	40.000	3.200	32.000	2.500
R 1.5 X 6	32.000	2.550	32.000	2.550	26.500	2.100	21.500	1.700
Max. cutting depth Maximale Schnitttiefe Profondità di taglio Profondeur de coupe								

1. Use a rigid and precise machine and holder.
2. When chattering occurs, reduce the speed and feed simultaneously.
3. Use a suitable cutting fluid with high smoke retardant properties.

1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spanmittel.
2. Falls Vibrationen auftreten sollten, Vorschub und Schnittgeschwindigkeit reduzieren.
3. Benutzen Sie Kühlmittel mit rauchemenden Zusätzen.

1. Utilizzare una macchina ed un mandrino di elevata rigidità e di alta precisione.
2. In caso di vibrazione, ridurre simultaneamente la velocità di taglio e l'avanzamento.
3. Utilizzare dei lubrificanti di taglio adeguanti, dotati di un elevato coefficiente di rallentamento di emissione del fumo.

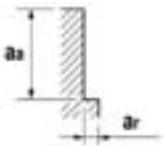
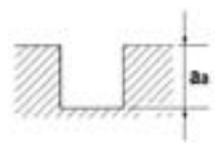
1. Utiliser une machine et un porte-outil de grande rigidité et de haute précision.
2. En cas de vibrations, réduisez, simultanément, la vitesse de coupe et l'avance.
3. Utiliser des fluides de coupes de haute qualité avec un coef. élevé de ralentissement d'émission de fumée.

CBN

## Conditions - Schnittwerte - Condizioni - Conditions

CA-RG-EDS



Work material Werkstoff Materiale Matière à usiner	AC A7075		Cu C1100		AC A7075		Cu C1100	
	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
Ø								
1	32.000	220	23.500	220	32.000	220	23.500	220
2	32.000	420	11.500	215	23.500	310	11.500	215
3	21.000	700	7.950	250	15.500	515	7.950	250
4	15.500	725	5.950	280	11.500	540	5.950	280
5	12.500	760	4.750	295	9.500	575	4.750	295
6	10.500	830	3.950	310	7.950	630	3.950	310
8	7.950	890	2.950	350	5.950	665	2.950	350
10	6.350	995	2.350	365	4.750	745	2.350	365
12	5.300	1.050	1.950	390	3.950	790	1.950	390
14	4.500	1.050	1.700	395	3.400	795	1.700	395
16	3.950	1.050	1.450	390	2.950	795	1.450	390
18	3.500	1.050	1.300	390	2.650	795	1.300	390
20	3.150	1.050	1.150	385	2.350	785	1.150	385
Max. cutting depth Maximale Schnitttiefe Profondità di taglio Profondeur de coupe	$a_a = 1.5D$ $a_r = 0.1D$ 				$a_a = 1D$ 			

1. Use a high rigidity machine set up.
2. Use soluble oil.

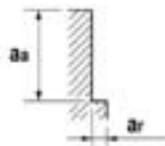
1. Utilizzare una macchina precisa e rigida.
2. Utilizzare dell'olio solubile.

1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spanmittel.
2. Wasserlösliches Kühlmittel benutzen

1. Utilisez une machine précise et rigide.
2. Utilisez de l'huile soluble.

CA

CA-RG-EDL

Work material Werkstoff Materiale Matière à usiner	AC A7075		Cu C1100	
	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
Ø				
3	13.000	390	6.350	195
4	9.900	400	4.750	210
5	7.950	400	3.800	245
6	6.600	450	3.150	260
8	4.950	500	2.350	275
10	3.950	600	1.900	295
12	3.300	630	1.550	305
Max. cutting depth Maximale Schnitttiefe Profondità di taglio Profondeur de coupe	$a_a = 2.5D$ $a_r = 0.1D$ 			

1. Use a high rigidity machine set up.
2. Use soluble oil.
3. For side milling, modify feed to obtain required finish quality

1. Utilizzare una macchina precisa e rigida.
2. Utilizzare dell'olio solubile.
3. Per la contornatura, modificate l'avanzamento per raggiungere lo stato della superficie richiesto.

1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spanmittel.
2. Wasserlösliches Kühlmittel benutzen.
3. Bei Seitenfräsen Vorschub anpassen um die erforderliche Finishing Qualität zu erreichen.

1. Utilisez une machine précise et rigide.
2. Utilisez de l'huile soluble.
3. Pour le contournage, modifiez l'avance pour atteindre l'état de surface requis.

## Conditions - Schnittwerte - Condizioni - Conditions



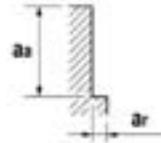
CA-ETS

Side milling - Konturfräsen -  
Conturnatura - Contournage

Work material Werkstoff Materiale Matière à usiner	AC A7075		AC <Si13%		Cu C1100	
	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
Ø	21.000	950	21.000	950	7.950	320
3	15.500	1.080	15.500	1.080	5.950	350
4	12.500	1.100	12.500	1.100	4.750	380
5	10.500	1.200	10.500	1.200	3.950	400
6	7.950	1.300	7.950	1.300	2.950	450
8	6.350	1.500	6.350	1.500	2.350	480
10	5.300	1.550	5.300	1.550	1.950	510
12	3.950	1.550	3.950	1.550	1.450	510
16	3.150	1.550	3.150	1.550	1.150	510
20						

Max. cutting depth  
Maximale Schnitttiefe  
Profondità di taglio  
Profondeur de coupe

aa	ar
1.50	0.10



1. Use a rigid and precise machine and holder.
2. When chattering occurs, reduce the speed and feed simultaneously.
3. Use a suitable cutting fluid with high smoke retardant properties.

1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spanmittel.
2. Falls Vibrationen auftreten sollten, Vorschub und Schnittgeschwindigkeit reduzieren.
3. Benutzen Sie Kühlmittel mit rauchemenden Zusätzen.

1. Utilizzare una macchina ed un mandrino di elevata rigidità e di alta precisione.
2. In caso di vibrazione, ridurre simultaneamente la velocità di taglio e l'avanzamento.
3. Utilizzare dei lubrificanti di taglio adeguati, dotati di un elevato coefficiente di rallentamento di emissione del fumo.

1. Utiliser une machine et un porte-outil de grande rigidité et de haute précision.
2. En cas de vibrations, réduisez, simultanément, la vitesse de coupe et l'avance.
3. Utiliser des fluides de coupes de haute qualité avec un coef. élevé de ralentissement d'émission de fumée.

CA

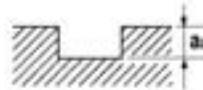
Slotting - Nutenfräsen -  
Per scanalature profonde - Rainurage

CA-ETS

Work material Werkstoff Materiale Matière à usiner	AC A7075		AC <Si13%		Cu C1100	
	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
Ø	21.000	670	21.000	670	7.950	325
3	15.500	700	15.500	700	5.950	365
4	12.500	745	12.500	745	4.750	385
5	10.500	820	10.500	820	3.950	405
6	7.950	865	7.950	865	2.950	455
8	6.350	970	6.350	970	2.350	475
10	5.300	1.030	5.300	1.030	1.950	510
12	3.950	1.030	3.950	1.030	1.450	510
16	3.150	1.030	3.150	1.030	1.150	500
20						

Max. cutting depth  
Maximale Schnitttiefe  
Profondità di taglio  
Profondeur de coupe

aa = 0.50



1. Use a rigid and precise machine and holder.
2. When chattering occurs, reduce the speed and feed simultaneously.
3. Use a suitable cutting fluid with high smoke retardant properties.

1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spanmittel.
2. Falls Vibrationen auftreten sollten, Vorschub und Schnittgeschwindigkeit reduzieren.
3. Benutzen Sie Kühlmittel mit rauchemenden Zusätzen.

1. Utilizzare una macchina ed un mandrino di elevata rigidità e di alta precisione.
2. In caso di vibrazione, ridurre simultaneamente la velocità di taglio e l'avanzamento.
3. Utilizzare dei lubrificanti di taglio adeguati, dotati di un elevato coefficiente di rallentamento di emissione del fumo.

1. Utiliser une machine et un porte-outil de grande rigidité et de haute précision.
2. En cas de vibrations, réduisez, simultanément, la vitesse de coupe et l'avance.
3. Utiliser des fluides de coupes de haute qualité avec un coef. élevé de ralentissement d'émission de fumée.

## Conditions - Schnittwerte - Condizioni - Conditions

CAP-EBD



Work material Werkstoff Materiale Matière à usiner	AC A7075		Cu C1100		AC A7075		Cu C1100	
	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
<b>R 3 X 6</b>	10.000	1.500	7.950	1.150	26.500	7.950	13.000	3.950
<b>R 4 X 8</b>	7.950	1.950	5.950	1.450	19.500	9.750	9.900	4.950
<b>R 5 X 10</b>	6.350	1.750	4.750	1.300	15.500	8.650	7.950	4.450
<b>R 6 X 12</b>	5.300	1.650	3.950	1.200	13.000	7.800	6.600	3.950
<b>R 8 X 16</b>	3.950	1.500	2.950	1.150	9.900	7.500	4.950	3.750
<b>R 10 X 20</b>	3.150	1.350	2.350	1.000	7.950	6.350	3.950	3.150
Max. cutting depth Maximale Schnitttiefe Profondità di taglio Profondeur de coupe	$a_a = 0.10$ $pf = 0.20$							

1. Use a high rigidity machine set up.
2. Use soluble oil.
3. When chattering occurs, reduce the speed and feed simultaneously.

1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spanmittel.
2. Wasserlösliches Kühlmittel benutzen
3. Kühlmittel mit niedriger Rauchentwicklung verwenden.

1. Utilizzare una macchina precisa e rigida.
2. Utilizzare dell'olio solubile.
3. Utilizzare dei lubrificanti da taglio adeguati, dotati di un coefficiente elevato di rallentamento d'emissione del fumo.

1. Utilisez une machine précise et rigide.
2. Utilisez de l'huile soluble.
3. En cas de vibrations, réduisez, simultanément, la vitesse de coupe et l'avance.

CA

## Conditions - Schnittwerte - Condizioni - Conditions

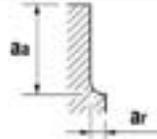
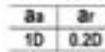


## CA-PKE

Side milling - Konturfräsen -  
Contornatura - Contournage

Work material Werkstoff Materiale Matière à usiner	AC A7075		AC <Si13%		Cu C1100	
	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
Ø						
3	21.000	1.100	21.000	1.100	7.950	325
4	15.500	1.250	15.500	1.250	5.950	365
5	12.500	1.280	12.500	1.275	4.750	385
6	10.500	1.400	10.500	1.400	3.950	400
8	7.950	1.500	7.950	1.500	2.950	460
10	6.350	1.700	6.350	1.700	2.350	475
12	5.300	1.750	5.300	1.750	1.950	510
16	3.950	1.750	3.950	1.750	1.450	510
20	3.150	1.750	3.150	1.750	1.150	510

Max. cutting depth  
Maximale Schnitttiefe  
Profondità di taglio  
Profondeur de coupe



1. Use a rigid and precise machine and holder.
2. When chattering occurs, reduce the speed and feed simultaneously.
3. Use a suitable cutting fluid with high smoke retardant properties.

1. Utilizzare una macchina ed un mandrino di elevata rigidità e di alta precisione.
2. In caso di vibrazione, ridurre simultaneamente la velocità di taglio e l'avanzamento.
3. Utilizzare dei lubrificanti di taglio adeguati, dotati di una elevato coefficiente di rallentamento di emissione del fumo.

1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spannmittel.
2. Falls Vibrationen auftreten sollten, Vorschub und Schnittgeschwindigkeit reduzieren.
3. Benutzen Sie Kühlmittel mit rauchemenden Zusätzen.

1. Utiliser une machine et un porte-outil de grande rigidité et de haute précision.
2. En cas de vibrations, réduisez, simultanément, la vitesse de coupe et l'avance.
3. Utiliser des fluides de coupes de haute qualité avec un coef. élevé de ralentissement d'émission de fumée.

CA

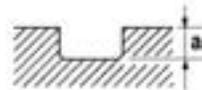
## CA-PKE

Slotting - Nutenfräsen -  
Per scanalature profonde - Rainurage

Work material Werkstoff Materiale Matière à usiner	AC A7075		AC <Si13%		Cu C1100	
	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
Ø						
3	21.000	770	21.000	770	7.950	325
4	15.500	810	15.500	810	5.950	375
5	12.500	860	12.500	860	4.750	385
6	10.500	950	10.500	950	3.950	400
8	8.000	1.000	8.000	1.000	2.950	460
10	6.350	1.130	6.350	1.130	2.350	475
12	5.300	1.180	5.300	1.180	1.950	510
16	3.950	1.180	3.950	1.180	1.450	510
20	3.150	1.180	3.150	1.180	1.150	510

Max. cutting depth  
Maximale Schnitttiefe  
Profondità di taglio  
Profondeur de coupe

$a_a = 0.50$



1. Use a rigid and precise machine and holder.
2. When chattering occurs, reduce the speed and feed simultaneously.
3. Use a suitable cutting fluid with high smoke retardant properties.

1. Utilizzare una macchina ed un mandrino di elevata rigidità e di alta precisione.
2. In caso di vibrazione, ridurre simultaneamente la velocità di taglio e l'avanzamento.
3. Utilizzare dei lubrificanti di taglio adeguati, dotati di una elevato coefficiente di rallentamento di emissione del fumo.

1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spannmittel.
2. Falls Vibrationen auftreten sollten, Vorschub und Schnittgeschwindigkeit reduzieren.
3. Benutzen Sie Kühlmittel mit rauchemenden Zusätzen.

1. Utiliser une machine et un porte-outil de grande rigidité et de haute précision.
2. En cas de vibrations, réduisez, simultanément, la vitesse de coupe et l'avance.
3. Utiliser des fluides de coupes de haute qualité avec un coef. élevé de ralentissement d'émission de fumée.

## Conditions - Schnittwerte - Condizioni - Conditions

High speed side milling - HSC Konturfräsen

CA-PKE

Fresatura alta velocità contornatura - Fraisage UGV contournage



Work material Werkstoff Materiale Matière à usiner	AC A7075		AC <Si13%		Cu C1100	
	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
Ø						
3	40.000	2.080	24.000	1.260	17.000	625
4	32.000	2.550	19.200	1.550	14.300	800
5	32.000	3.250	19.200	1.950	12.700	925
6	26.500	3.500	15.900	2.150	10.600	959
8	20.000	3.750	12.000	2.250	8.000	1.130
10	16.000	4.300	9.600	2.580	6.350	1.150
12	13.300	4.400	7.980	2.650	5.300	1.250
16	10.000	4.400	6.000	2.650	4.000	1.250
20	8.000	4.400	4.800	2.650	3.200	1.250

Max. cutting depth  
Maximale Schnitttiefe  
Profondità di taglio  
Profondeur de coupe

1. Use a rigid and precise machine and holder.
2. When chattering occurs, reduce the speed and feed simultaneously.
3. Use a suitable cutting fluid with high smoke retardant properties.

1. Utilizzare una macchina ed un mandrino di elevata rigidità e di alta precisione.
2. In caso di vibrazione, ridurre simultaneamente la velocità di taglio e l'avanzamento.
3. Utilizzare dei lubrificanti di taglio adeguati, dotati di una elevato coefficiente di rallentamento di emissione del fumo.

1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spannmittel.
2. Falls Vibrationen auftreten sollten, Vorschub und Schnittgeschwindigkeit reduzieren.
3. Benutzen Sie Kühlmittel mit rauchemenden Zusätzen.

1. Utiliser une machine et un porte-outil de grande rigidité et de haute précision.
2. En cas de vibrations, réduisez, simultanément, la vitesse de coupe et l'avance.
3. Utiliser des fluides de coupes de haute qualité avec un coef. élevé de ralentissement d'émission de fumée.

High speed slotting milling - HSC Nutenfräsen -

CA-PKE

Fresatura alta velocità, per scanalature profonde - Fraisage UGV rainurage

CA

Work material Werkstoff Materiale Matière à usiner	AC A7075		AC <Si13%	
	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
Ø				
3	40.000	1.450	24.000	880
4	32.000	1.680	19.200	1.000
5	32.000	2.200	19.200	1.330
6	26.500	2.400	15.900	1.450
8	20.000	2.500	12.000	1.500
10	16.000	2.800	9.600	1.700
12	13.300	2.950	7.980	1.780
16	10.000	3.000	6.000	1.800
20	8.000	3.000	4.800	1.800

Max. cutting depth  
Maximale Schnitttiefe  
Profondità di taglio  
Profondeur de coupe

$aa = 0.250$

1. Use a rigid and precise machine and holder.
2. When chattering occurs, reduce the speed and feed simultaneously.
3. Use a suitable cutting fluid with high smoke retardant properties.

1. Utilizzare una macchina ed un mandrino di elevata rigidità e di alta precisione.
2. In caso di vibrazione, ridurre simultaneamente la velocità di taglio e l'avanzamento.
3. Utilizzare dei lubrificanti di taglio adeguati, dotati di una elevato coefficiente di rallentamento di emissione del fumo.

1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spannmittel.
2. Falls Vibrationen auftreten sollten, Vorschub und Schnittgeschwindigkeit reduzieren.
3. Benutzen Sie Kühlmittel mit rauchemenden Zusätzen.

1. Utiliser une machine et un porte-outil de grande rigidité et de haute précision.
2. En cas de vibrations, réduisez, simultanément, la vitesse de coupe et l'avance.
3. Utiliser des fluides de coupes de haute qualité avec un coef. élevé de ralentissement d'émission de fumée.

## Conditions - Schnittwerte - Condizioni - Conditions



CA-MFE

High speed side milling - HSC Konturfräsen  
Fresatura alta velocità contornatura- Fraisage UGV contournage

Work material Werkstoff Materiale Matière à usiner	AC A7075		AC <Si13%		Cu C1100	
	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
Ø						
10	16.000	4.300	9.600	2.580	6.350	1.150
12	13.300	4.400	8.000	2.650	5.300	1.250
14	11.500	4.400	6.900	2.650	4.000	1.250
18	8.850	4.400	5.300	2.650	3.500	1.250
22	7.400	4.000	4.500	2.400	3.000	1.200

Max. cutting depth Maximale Schnitttiefe Profondità di taglio Profondeur de coupe	Profondeur de coupe Maximum cutting depth		S.	F.	
	aa	ar			
	DX4	1.2D	0.1D	100%	100%
	DX5	1.2D	0.05D	60~80%	60~80%
	DX6	1.2D	0.025D	40~60%	40~60%

1. Use a rigid and precise machine and holder.
2. When chattering occurs, reduce the speed and feed simultaneously.
3. Use a suitable cutting fluid with high smoke retardant properties.

1. Utilizzare una macchina ed un mandrino di elevata rigidità e di alta precisione.
2. In caso di vibrazioni, ridurre simultaneamente la velocità di taglio e l'avanzamento.
3. Utilizzare dei lubrificanti di taglio adeguati, dotati di un elevato coefficiente di rallentamento di emissione del fumo.

1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spanmittel.
2. Falls Vibrationen auftreten sollten, Vorschub und Schnittgeschwindigkeit reduzieren.
3. Benutzen Sie Kühlmittel mit rauchemenden Zusätzen.

1. Utiliser une machine et un porte-outil de grande rigidité et de haute précision.
2. En cas de vibrations, réduisez, simultanément, la vitesse de coupe et l'avance.
3. Utiliser des fluides de coupes de haute qualité avec un coef, élevé de ralentissement d'émission de fumée.

CA

CA-MFE

High speed slotting milling - HSC Nutenfräsen -  
Fresatura alta velocità, per scanalature profonde - Fraisage UGV rainurage

Work material Werkstoff Materiale Matière à usiner	AC A7075		AC <Si13%	
	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
Ø				
10	16.000	2.800	9.600	1.700
12	13.300	2.950	7.980	1.780
14	11.500	3.000	6.000	1.800
18	8.850	3.000	5.300	1.800
22	7.400	3.000	4.450	1.800

Max. cutting depth Maximale Schnitttiefe Profondità di taglio Profondeur de coupe	Profondeur de coupe Maximum cutting depth		S.	F.
	aa	Prof. de coupe Max. cutting depth		
	DX4	0.1D	100%	100%
	DX5	0.05D	60~80%	60~80%
	DX6	0.025D	40~60%	40~60%

1. Use a rigid and precise machine and holder.
2. When chattering occurs, reduce the speed and feed simultaneously.
3. Use a suitable cutting fluid with high smoke retardant properties.

1. Utilizzare una macchina ed un mandrino di elevata rigidità e di alta precisione.
2. In caso di vibrazione, ridurre simultaneamente la velocità di taglio e l'avanzamento.
3. Utilizzare dei lubrificanti di taglio adeguati, dotati di un elevato coefficiente di rallentamento di emissione del fumo.

1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spanmittel.
2. Falls Vibrationen auftreten sollten, Vorschub und Schnittgeschwindigkeit reduzieren.
3. Benutzen Sie Kühlmittel mit rauchemenden Zusätzen.

1. Utiliser une machine et un porte-outil de grande rigidité et de haute précision.
2. En cas de vibrations, réduisez, simultanément, la vitesse de coupe et l'avance.
3. Utiliser des fluides de coupes de haute qualité avec un coef, élevé de ralentissement d'émission de fumée.

## Conditions - Schnittwerte - Condizioni - Conditions

CRN-LN-EDS



Work material Werkstoff Materiale Matière à usiner	Cu									
	C1100									
	Slotting - Nutenfräsen - Per scanalature profonde - Rainurage					Side milling - Konturfraßen - Sgrossatura e contornatura - Contournage				
	Conventional milling - Normales Fräsen - Fresatura convenzionale - Fraisage conventionnel		Dry milling - Trockenbearbeitung - Fresatura a secco - Fraisage à sec		Conventional milling - Normales Fräsen - Fresatura convenzionale - Fraisage conventionnel		High Speed Milling - HRC Fräsen - Fresatura ad alta velocità - Fraisage Haute Vitesse		Dry milling - Trockenbearbeitung - Fresatura a secco - Fraisage à sec	
Ø	S. (min <sup>-1</sup> )	F. (mm/min)			S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)		
0.5	32.000	125	32.000	125	32.000	125	50.000	200	32.000	125
0.8	32.000	150	32.000	150	31.500	150	50.000	240	31.500	150
1	32.000	190	32.000	190	25.000	150	50.000	300	25.000	150
1.5	15.500	140	15.500	140	16.500	145	42.000	375	16.500	145
2	11.500	135	11.500	135	12.500	150	31.500	375	12.500	150
2.5	9.500	175	9.500	175	10.000	185	25.000	470	10.000	185
3	7.950	220	7.950	220	8.450	235	21.000	585	8.450	235
4	5.950	235	5.950	235	6.350	250	15.500	620	6.350	250
5	4.750	285	4.750	285	5.050	300	12.500	750	5.050	300
6	3.950	250	3.950	250	4.200	265	10.500	670	4.200	265
8	2.950	260	2.950	260	3.150	275	7.950	700	3.150	275
10	2.350	245	2.350	245	2.500	265	6.350	670	2.500	265
12	1.950	250	1.950	250	2.100	265	5.300	675	2.100	265

Max. cutting depth Maximale Schnitttiefe Profondità di taglio Profondeur de coupe	$D < \varnothing 1 \quad a_a = 0.05D$ $\varnothing 1 \leq D \quad a_a = 0.1D$		$D < \varnothing 1 \quad a_a = 1.5D \quad a_r = 0.02D$ $\varnothing 1 \leq D \quad a_a = 1.5D \quad a_r = 0.05D$	$D < \varnothing 1 \quad a_a = 1.5D \quad a_r = 0.01D$ $\varnothing 1 \leq D \quad a_a = 1.5D \quad a_r = 0.02D$	
--------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------	--	---------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------	--

1. Use a high rigidity machine set up.
  2. Use soluble oil.
  3. When chattering occurs, reduce the speed and feed simultaneously.
  4. During dry (no fluid) milling, please use air blow to remove disposable chips from the milling area and to eliminate chip packing.
- 
1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spanmittel.
  2. Wasserlösliches Kühlmittel benutzen
  3. Benutzen Sie Kühlmittel mit rauchemenden Zusätzen.
  4. Bei Trockenbearbeitung Druckluft zum Entfernen der Späne verwenden.

1. Utilizzare una macchina precisa e rigida.
  2. Utilizzare dell'olio solubile.
  3. Utilizzare dei lubrificanti di taglio adeguanti, dotati di un elevato coefficiente di rallentamento di emissione del fumo.
  4. Per fresatura a secco utilizzare aria.
- 
1. Utilisez une machine précise et rigide.
  2. Utilisez de l'huile soluble.
  3. Utilisez des fluides de coupes de haute qualité avec un coef. élevé de ralentissement d'émission de fumée.
  4. En cas d'usinage à sec, utiliser de l'air comprimé pour l'évacuation des copeaux de l'aire d'usinage et pour éviter une agglomération des copeaux.

CRN

CRN-EMS

Work material Werkstoff Materiale Matière à usiner	Cu					
	C1100					
	Conventional milling - Normales Fräsen - Fresatura convenzionale - Fraisage conventionnel		High Speed Milling - HRC Fräsen - Fresatura ad alta velocità - Fraisage Haute Vitesse		Dry milling - Trockenbearbeitung - Fresatura a secco - Fraisage à sec	
Ø	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
3	10.500	600	26.500	1.200	10.500	475
4	7.950	635	19.500	1.200	7.950	505
5	6.350	740	15.500	1.450	6.350	590
6	5.300	735	13.000	1.450	5.300	590
8	3.950	705	9.900	1.500	3.950	615
10	3.150	705	7.950	1.550	3.150	630
12	2.650	710	6.600	1.550	2.650	625

Max. cutting depth Maximale Schnitttiefe Profondità di taglio Profondeur de coupe	$a_a = 1.5D \quad a_r = 0.1D$		$D < \varnothing 8 \quad a_a = 1.5D \quad a_r = 0.01D$ $\varnothing 8 \leq D \quad a_a = 1.5D \quad a_r = 0.02D$	
--------------------------------------------------------------------------------------------	-------------------------------	--	---------------------------------------------------------------------------------------------------------------------	--

1. Use a high rigidity machine set up.
  2. Use soluble oil.
  3. When chattering occurs, reduce the speed and feed simultaneously.
  4. During dry (no fluid) milling, please use air blow to remove disposable chips from the milling area and to eliminate chip packing.
- 
1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spanmittel.
  2. Wasserlösliches Kühlmittel benutzen
  3. Benutzen Sie Kühlmittel mit rauchemenden Zusätzen.
  4. Bei Trockenbearbeitung Druckluft zum Entfernen der Späne verwenden.

1. Utilizzare una macchina precisa e rigida.
  2. Utilizzare dell'olio solubile.
  3. Utilizzare dei lubrificanti di taglio adeguanti, dotati di un elevato coefficiente di rallentamento di emissione del fumo.
  4. Per fresatura a secco utilizzare aria.
- 
1. Utilisez une machine précise et rigide.
  2. Utilisez de l'huile soluble.
  3. Utilisez des fluides de coupes de haute qualité avec un coef. élevé de ralentissement d'émission de fumée.
  4. En cas d'usinage à sec, utiliser de l'air comprimé pour l'évacuation des copeaux de l'aire d'usinage et pour éviter une agglomération des copeaux.

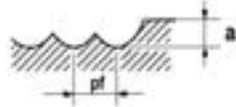
## Conditions - Schnittwerte - Condizioni - Conditions

## CRN-EBD

Work material Werkstoff Materiale Matière à usiner	Cu					
	C1100					
	Conventional milling - Normales Fräsen - Fresatura convenzionale - Fraisage conventionnel		High Speed Milling - HRC Fräsen - Fresatura ad alta velocità - Fraisage Haute Vitesse		Dry milling - Trockenbearbeitung - Fresatura a secco - Fraisage à sec	
Ø	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
R 3 X 6	7.950	1.150	13.000	3.900	6.360	460
R 4 X 8	5.950	1.450	9.900	4.950	4.760	580
R 5 X 10	4.750	1.300	7.950	4.450	3.800	520
R 6 X 12	3.950	1.200	6.600	3.950	3.160	480

Max. cutting depth  
Maximale Schnitttiefe  
Profondità di taglio  
Profondeur de coupe

$a_a = 0.10$   
 $pf = 0.20$



1. Use a high rigidity machine set up.
  2. Use soluble oil.
  3. When chattering occurs, reduce the speed and feed simultaneously.
  4. During dry (no fluid) milling, please use air blow to remove disposable chips from the milling area and to eliminate chip packing.
1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spannmittel.
  2. Wasserlösliches Kühlmittel benutzen
  3. Benutzen Sie Kühlmittel mit rauchemenden Zusätzen.
  4. Bei Trockenbearbeitung Druckluft zum Entfernen der Späne verwenden.

1. Utilizzare una macchina precisa e rigida.
  2. Utilizzare dell'olio solubile.
  3. Utilizzare dei lubrificanti di taglio adeguati, dotati di un elevato coefficiente di rallentamento di emissione del fumo.
  4. Per fresatura a secco utilizzare aria.
1. Utilisez une machine précise et rigide.
  2. Utilisez de l'huile soluble.
  3. Utilisez des fluides de coupes de haute qualité avec un coef, élevé de ralentissement d'émission de fumée.
  4. En cas d'usinage à sec, utiliser de l'air comprimé pour l'évacuation des copeaux de l'aire d'usinage et pour éviter une agglomération des Copeaux.

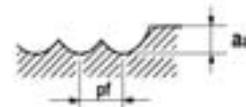
## CRN-LN-EBD

Work material Werkstoff Materiale Matière à usiner	Cu					
	C1100					
	Conventional milling - Normales Fräsen - Fresatura convenzionale - Fraisage conventionnel		High Speed Milling - HRC Fräsen - Fresatura ad alta velocità - Fraisage Haute Vitesse		Dry milling - Trockenbearbeitung - Fresatura a secco - Fraisage à sec	
Ø	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)	S. (min <sup>-1</sup> )	F. (mm/min)
R 0.5	32.000	690	50.000	1.050	31.500	680
R 0.6	31.500	700	50.000	1.100	26.500	590
R 0.7	27.000	680	45.000	1.100	22.500	565
R 0.75	25.000	675	42.000	1.100	21.000	565
R 0.8	23.500	675	39.500	1.100	19.500	560
R 0.9	21.000	680	35.000	1.100	17.500	565
R 1	19.000	680	31.500	1.100	15.500	555
R 1.25	15.000	675	25.000	1.100	12.500	560
R 1.5	12.500	675	21.000	1.100	10.500	565
R 1.75	10.500	660	18.000	1.100	9.050	570
R 2	9.500	680	15.500	1.100	7.950	570
R 2.5	7.600	770	12.500	1.250	6.350	640

Max. cutting depth  
Maximale Schnitttiefe  
Profondità di taglio  
Profondeur de coupe

$a_a = 0.05D$   
 $pf = 0.20$

$a_a = 0.02D$   
 $pf = 0.05D$



1. Use a high rigidity machine set up.
  2. Use soluble oil.
  3. When chattering occurs, reduce the speed and feed simultaneously.
  4. During dry (no fluid) milling, please use air blow to remove disposable chips from the milling area and to eliminate chip packing.
1. Benutzen Sie stabile und präzise Maschinen, Werkzeugaufnahmen und Spannmittel.
  2. Wasserlösliches Kühlmittel benutzen
  3. Benutzen Sie Kühlmittel mit rauchemenden Zusätzen.
  4. Bei Trockenbearbeitung Druckluft zum Entfernen der Späne verwenden.

1. Utilizzare una macchina precisa e rigida.
  2. Utilizzare dell'olio solubile.
  3. Utilizzare dei lubrificanti di taglio adeguati, dotati di un elevato coefficiente di rallentamento di emissione del fumo.
  4. Per fresatura a secco utilizzare aria.
1. Utilisez une machine précise et rigide.
  2. Utilisez de l'huile soluble.
  3. Utilisez des fluides de coupes de haute qualité avec un coef, élevé de ralentissement d'émission de fumée.
  4. En cas d'usinage à sec, utiliser de l'air comprimé pour l'évacuation des copeaux de l'aire d'usinage et pour éviter une agglomération des Copeaux.

## TABLE

## Conversion

Hardness - Härte - Durezza - Dureté			
HRA	HRC	HV	HB
		120	114
		125	119
		130	123
		135	128
		140	133
		145	138
		150	142
		155	147
		160	152
		165	157
		170	161
		175	166
		180	171
		185	176
		190	180
		195	185
		200	190
		205	195
		210	199
		215	204
		220	209
		225	214
		230	218
		235	223
60.7	20.5	240	228
61.2	21.5	245	233
61.6	22.0	250	237
62.4	24.0	260	247
63.1	25.5	270	256
63.8	27.0	280	266
64.5	28.5	290	275
65.2	30.0	300	285
65.8	31.0	310	294
66.4	32.0	320	304
67.0	33.5	330	313
67.6	34.5	340	323
68.1	35.5	350	332
68.7	36.5	360	342
69.2	37.5	370	351
69.8	39.0	380	361
70.3	40.0	390	370
70.8	41.0	400	380
71.4	42.0	410	389
71.8	42.5	420	399
72.3	43.5	430	408
72.8	44.5	440	418
73.3	45.5	450	427
73.6	46.0	460	432
74.1	47.0	470	442
74.5	47.5	480	450
74.9	48.5	490	456
75.3	49.0	500	466
75.7	50.0	510	475
76.1	50.5	520	483
76.4	51.0	530	492
76.7	51.5	540	500
77.0	52.5	550	509
77.4	53.0	560	517
77.8	53.5	570	526
78.0	54.0	580	535
78.4	54.5	590	543
78.6	55.0	600	552
79.2	56.5	620	569
79.8	57.5	640	586
80.3	58.5	660	
80.8	59.0	680	
81.3	60.0	700	
81.8	61.0	720	
82.2	62.0	740	
82.6	62.5	760	
83.0	63.5	780	
83.4	64.0	800	
83.8	64.5	820	
84.1	65.5	840	
84.4	66.0	860	
84.7	66.5	880	
85.0	67.0	900	
85.3	67.5	920	
85.6	68.0	940	

Traction - Traktion - Trazione - Traktion	
Kgf/mm <sup>2</sup>	N/mm <sup>2</sup> ou Mpa
42	410
43	420
45	440
46	450
48	470
49	480
51	500
52	510
54	530
55	540
56	550
58	570
59	580
61	600
62	610
64.5	630
66.5	650
67.5	660
69.5	680
70.5	690
72.5	710
73.5	720
75.5	740
76.5	750
78.5	770
79.5	780
81.5	800
84.5	830
88	860
91	890
95	930
98	960
101	990
104	1020
108	1060
111	1090
114	1120
118	1160
121	1190
124	1220
129	1260
132	1290
136	1330
139	1360
143	1400
146	1430
150	1470
153	1500
157	1540
160	1570
164	1610
168	1650
171	1680
175	1720
180	1760
183	1790
187	1830
191	1870
195	1910
198	1940
202	1980
206	2020
214	2100
222	2180



# Notes



OSG UK Ltd.

## EXTRACT OF OUR GENERAL CONDITIONS

### TERMS OF PAYMENT

Subject to credit being approved and unless otherwise expressly agreed accounts are due for payment not later than the end of the month following the month of despatch; otherwise payment must be received by the Company before delivery. When deliveries are spread over a period each consignment will be invoiced as despatched and each month's invoices will be treated as a separate account and be payable according. Failure to pay for any goods or for any delivery or instalment shall entitle the Company to suspend further deliveries and work both on the same order and on any other order from the Customer without prejudice to any other rights the Company may have. The Company reserves the right where genuine doubts arise as to a Customer's financial position or in the case of failure to pay for any goods or any delivery or instalment as aforesaid to suspend delivery of any order or any part or instalment without ability until payment or satisfactory security for payment has been provided.

### TITLE TO GOODS

Until payment in full has been received by the Company for all goods whatsoever supplied at any time by the Company to the Customer. Property in the goods shall remain in the Company and the Customer shall hold the goods as bailee on behalf of the Company

### LEGAL CONSTRUCTION

These conditions of Sale shall be constructed in accordance with English Law and be subject to the jurisdiction of the English Courts.

### OSG GmbH

#### EXTRAKT ALLGEMEINE VERKAUFS-; LIEFER- UND ZAHLUNGSBEDIN- GUNGEN

#### PREISE

Unsere Preise verstehen sich, wenn nicht anders vereinbart, ab Lager oder Lieferwerk, ausschließlich Verpackung, die zu den Selbstkosten berechnet und nicht zurückgenommen wird. Zu den Preisen kommt die Mehrwertsteuer in der jeweiligen gesetzlichen Höhe hinzu. Sämtliche Berechnungen erfolgen in Euro. Die Zahlung hat, wenn nicht anders vereinbart ist, bar ohne jeden Abzug frei Zahlstelle des Lieferanten zu erfolgen. Das Zurückbehalten von Zahlungen sowie die Aufrechnung etwaiger von

uns bestrittener Gegenansprüche sind nicht zulässig. Bei verspäteter oder gestundeter Zahlung werden bankübliche Zinsen und Provisionen berechnet. Vor völliger Bezahlung fälliger Rechnungsbeträge, einschließlich Verzugszinsen, sind wir zu keiner weiteren Lieferung aus irgendeinem laufenden Vertrag verpflichtet. Bleibt der Besteller mit einer fälligen Zahlung im Rückstand oder tritt in seinen Vermögensverhältnissen eine

wesentliche Verschlechterung ein bzw. lauten die über ihn eingeholten Auskünfte unbefriedigend, so wir nach unserer Wahl berechtigt, Vorkasse oder die Erbringung einer Sicherheit vor Lieferung zu verlangen.

Zahlungen dürfen nur an uns unmittelbar oder an einen von uns besonders Beauftragten, der einen Sonderausweis zum Inkasso besitzt, geleistet werden. Bei Zahlungen, die auf andere Weise geleistet werden, haftet der Besteller in voller Höhe des von uns zu fordernden Betrages.

### EIGENTUMSVORBEHALT

Alle gelieferten Waren bleiben unser Eigentum (Vorbehaltsware) bis zur Erfüllung sämtlicher Forderungen gleich aus welchem Rechtsgrund, einschließlich der künftig entstehenden oder später abgeschlossenen Verträge. Das gilt auch, wenn Zahlungen auf besonders bezeichnete Forderungen geleistet wurden. Der Besteller ist verpflichtet, den Liefergegenstand gegen Diebstahl, Feuer und sonstige Schäden zu versichern und uns den Abschluss nachzuweisen. Der Liefergegenstand darf vom Besteller weder verpfändet noch zur Sicherung übereignet werden. Im Falle von Pfändungen, Beschlagnahme oder sonstige Verfügung durch Dritte hat der Besteller uns davon unverzüglich ausreichend zu unterrichten. Unter Eigentumsvorbehalt stehende Waren dürfen nur im regelmäßigen Geschäftsverkehr veräußert werden, wenn sichergestellt ist, dass die Forderungen aus dem Weiterverkauf auf uns übergeht und der Eigentumsvorbehalt durch den Besteller an seine Kunden weitergeleitet wird. Der Besteller tritt bereits jetzt die ihm aus dem Weiterverkauf oder aus der sonstigen Verwendung der Ware zustehende Forderungen Nebenrechten an uns ab. Die Ermächtigung zum Weiterverkauf ist widerruflich. Der Besteller verpflichtet sich, uns im Falle des Zahlungsverzuges unverzüglich den Abnehmer der Vorbehaltsware zu benennen.

Fälle vertragswidrigen Verhaltens des Bestellers, wozu auch der Zahlungsverzug rechnet, sind wir nach Mahnung zur Zurücknahme des unter Eigentumsvorbehalt gelieferten Gegenstandes berechtigt, und Besteller ist zur Herausgabe verpflichtet. Weder die Geltendmachung des Eigentumsvorbehaltes noch Pfändung des Liefergegenstandes durch uns gelten, sofern nicht das Abzahlungsgesetz Anwendung findet, als Rücktritt vom Vertrag.

### ANZUWENDENDEN RECHT, ERFÜLLUNGSORT UND GERICHTSSTAND

Die Vertragsbeziehungen unterliegen ausschließlich dem Recht der Bundesrepublik Deutschland. Die Anwendung internationaler Kaufrechtsgesetze wird ausgeschlossen. Erfüllungsort für sämtliche aus dem Vertragsverhältnis sich ergebenden Rechte und Verbindlichkeiten ist Ostfildern Nellingen. Gerichtsstand für sämtliche sich aus dem Vertragsverhältnis ergebende Rechte und Verbindlichkeiten ist, wenn der Besteller Vollkaufmann, eine juristische Person des öffentlichen Rechts oder ein öffentliches Sondervermögen ist, Ostfildern bzw. Esslingen.

Der Verkauf aller Waren erfolgt ausschließlich zu unseren allgemeinen Geschäftsbedingungen welche Sie jederzeit bei uns anfordern oder online unter <http://www.osg-germany.de/AGB.pdf> einsehen können.

### OSG ITALIA s.r.l.

#### CONDIZIONI GENERALI DI VENDITA

#### PAGAMENTI

Non sono riconosciuti se fatti a persone non munite di regolare mandato. Gli assegni devono essere intestati alla nostra ditta con dicitura "NON TRASFERIBILE" anche se l'assegno viene consegnato a un nostro incaricato. Non si accettano sconti ed abbuoni se non concordati preventivamente.

#### RESI

Non si accetta il reso merce senza nostra preventiva autorizzazione scritta. La merce resa qualunque ne sia il motivo, deve essere resa in porto franco alla nostra sede di Torino. Per il controllo e le pratiche amministrative relative alla merce da Voi restituita vi verrà addebitato il 10% del valore. Per eventuali ammanchi nei quantitativi o per difetto, dovranno pervenirci entro 10 giorni dalla data di spedizione della merce. Controversie e contestazioni di qualsiasi natura: unico foro competente quello di Torino.

### OSG EUROPE s.a.

#### EXTRACT OF OUR GENERAL CONDITIONS

All our invoices are established net prices and without discount, payable on the deadline as indicated on the invoice.

Any remark after 8 days from date of receiving the good will not be accepted.

In case of delay in payments of more than 15 days after the date of reception of the goods, the amount due will be increased with 1% per month, with a maximum of 25 €.

All goods are sold with the reserve of property transfer until full payment of the selling price.

In case of contesting of an invoice, the Court of Nivelles (Belgium) are the only accredited.

The contents of this catalogue are provided to you for viewing only. They are not intended for reproduction either in part or in whole in this or any other medium.

They cannot be copied, used to create derivation work or used for any reason, by means without the express, written permission of the copyright owner.

Copyright 2007 - OSG Europe - All rights reserved



~ 40 HRC	Hardened steels Pre-hardened steels	Legierter Stahl Gehärteter Stahl	Acciai temperato Acciai pre-temperato	Aciers trempés Aciers pré-trempés
----------	----------------------------------------	-------------------------------------	------------------------------------------	--------------------------------------

~ 45 HRC	Hardened steels Pre-hardened steels	Legierter Stahl Gehärteter Stahl	Acciai temperato Acciai pre-temperato	Aciers trempés Aciers pré-trempés
----------	----------------------------------------	-------------------------------------	------------------------------------------	--------------------------------------

~ 55 HRC	Hardened steels Pre-hardened steels	Legierter Stahl Gehärteter Stahl	Acciai temperato Acciai pre-temperato	Aciers trempés Aciers pré-trempés
----------	----------------------------------------	-------------------------------------	------------------------------------------	--------------------------------------

~ 60 HRC	Hardened steels Pre-hardened steels	Legierter Stahl Gehärteter Stahl	Acciai temperato Acciai pre-temperato	Aciers trempés Aciers pré-trempés
----------	----------------------------------------	-------------------------------------	------------------------------------------	--------------------------------------

~ 65 HRC	Hardened steels Pre-hardened steels	Legierter Stahl Gehärteter Stahl	Acciai temperato Acciai pre-temperato	Aciers trempés Aciers pré-trempés
----------	----------------------------------------	-------------------------------------	------------------------------------------	--------------------------------------

SUS	Stainless steels ~ 35 HRC	VA Stahl ~ 35 HRC	Acciai inossidabili ~ 35 HRC	Inoxydable ~ 35 HRC
-----	------------------------------	-------------------	---------------------------------	---------------------

GG	Cast iron ~ 350 HB	Grauguss ~ 350 HB	Ghisa grigia ~ 350 HB	Fonte ~ 350 HB
----	--------------------	-------------------	-----------------------	----------------

Cu	Copper alloys	Kupferlegierungen	Rame	Alliages de cuivre
----	---------------	-------------------	------	--------------------

Ac	Aluminium alloys	Aluminium- legierungen	Leghe di Alluminio	Alliages d'aluminium
----	------------------	---------------------------	--------------------	----------------------

Gr	Graphite	Graphit	Rame e grafite	Graphite
----	----------	---------	----------------	----------

Ti	Titanium alloys	Titaniumlegierungen	Leghe di Titanio	Alliages de Titane
----	-----------------	---------------------	------------------	--------------------

HRS	Heat resisting steels	Hitzebeständige legierungen	Acciai resistenti al calore	Alliages à haute résistance temp.
-----	-----------------------	--------------------------------	--------------------------------	--------------------------------------

Plast.	Plastics	Kunststoff	Acciai plastiche	Plastiques
--------	----------	------------	------------------	------------

◎	Excellent	Sehr gut	Ottimo	Excellent
○	Good	Gut	Buono	Bon



[www.osgeurope.com](http://www.osgeurope.com)



**OSG EUROPE s.a.**

Avenue Lavoisier 1  
B-1300 Z.I. Wavre-Nord  
Belgium

T +32 10 23 05 08  
F +32 10 23 05 31

**OSG BELGIUM s.a. n.v.**

Avenue Lavoisier 1  
B-1300 Z.I. Wavre-Nord  
Belgium  
T +32 10 23 05 04  
F +32 10 23 05 31

**OSG FRANCE s.a.r.l.**

Paris Nord 2  
385, rue de la Belle Etoile  
4, allée du Ponant  
BP 66191 Roissy en France  
F-95974 Roissy Ch. de Gaulle Cedex  
France  
T +33 1 49 90 10 10  
F +33 1 49 90 10 15

**OSG NEDERLAND b.v.**

Steenovenweg 3  
NL-5708 HN Helmond  
Netherland  
T +31 492 54 04 96  
F +31 492 52 76 75

**OSG UK Ltd.**

Shelton House 1  
5 Bentalls Pippis Hill Ind. Est.  
Basildon Essex SS14 3BY  
United Kingdom  
T +44 845 305 1066  
F +44 845 305 1067

**OSG GmbH.**

Felix Wankel Strasse 15  
D-73760 Ostfildern  
Germany  
T +49 711 550 93 60  
F +49 711 550 93 650

**OSG SCANDINAVIA A/S**

Langebjergvaenget 16  
Postbox 125  
4000 Roskilde  
Denmark  
T +45 46 75 65 55  
F +45 46 75 67 00

**OSG TI s.l.**

Feixa Llarga 78  
E-08907 Hospitalet de Llobregat  
Spain  
T +34 932 618 111  
F +34 932 630 326

**OSG ITALIA s.r.l.**

Via Cirenaica n. 52 int. 61/63  
I-10142 Torino  
Italy  
T +39 011770 5211  
F +39 011707 1402

**OSG EUROPE s.a.**

Avenue Lavoisier 1  
B-1300 Z.I. Wavre-Nord  
Belgium  
T +32 10 23 05 08  
F +32 10 23 05 31

EUR09R07a