





# Milling · Fräsen

## **Indexable Milling Tools**

Indexable milling tools

Indexable milling inserts

Technical information

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Technische Informationen

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Solid carbide end mills

Technical information

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Vollhartmetall Schafffräser

Technische Information



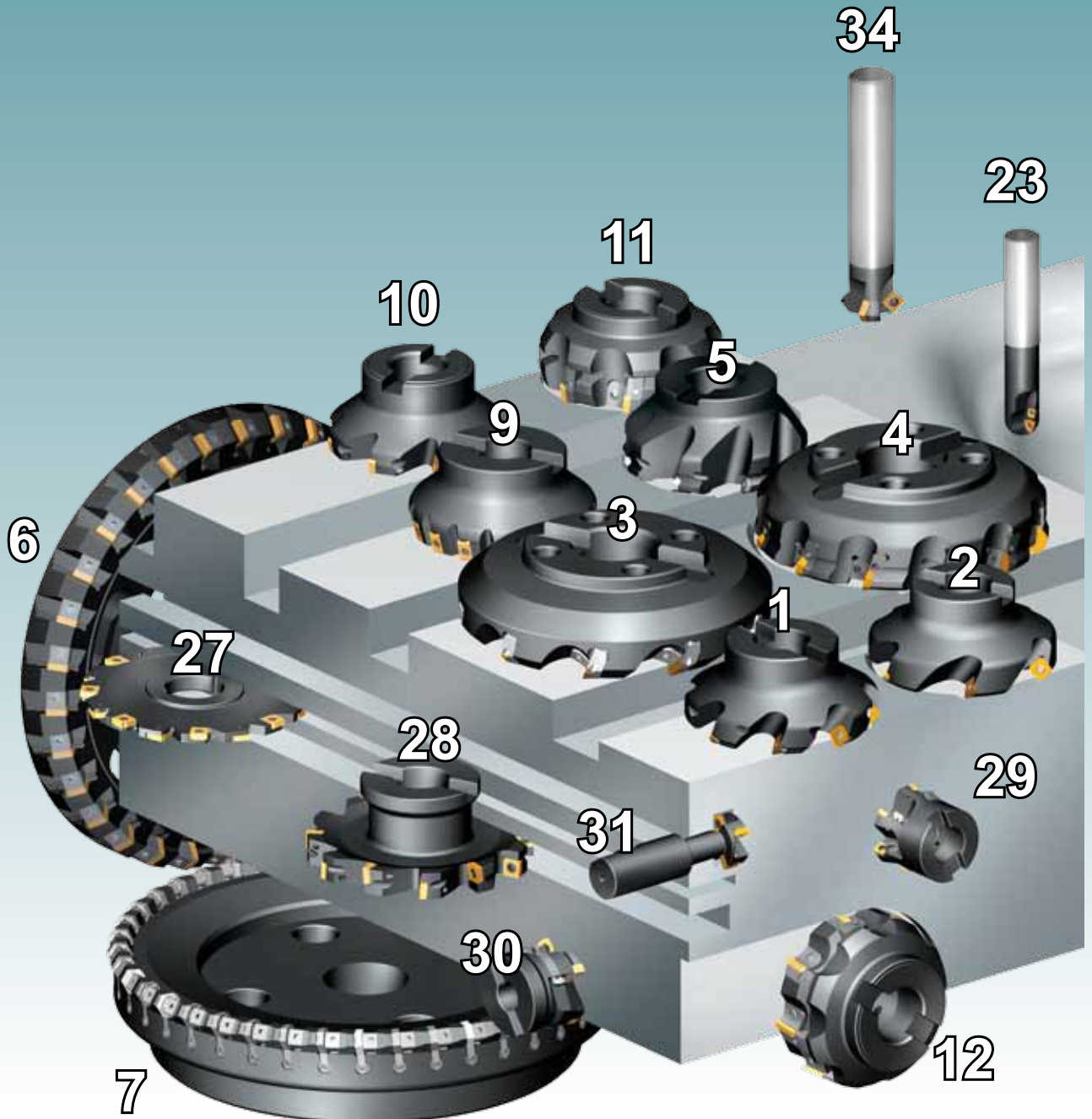


# Milling · Fräsen

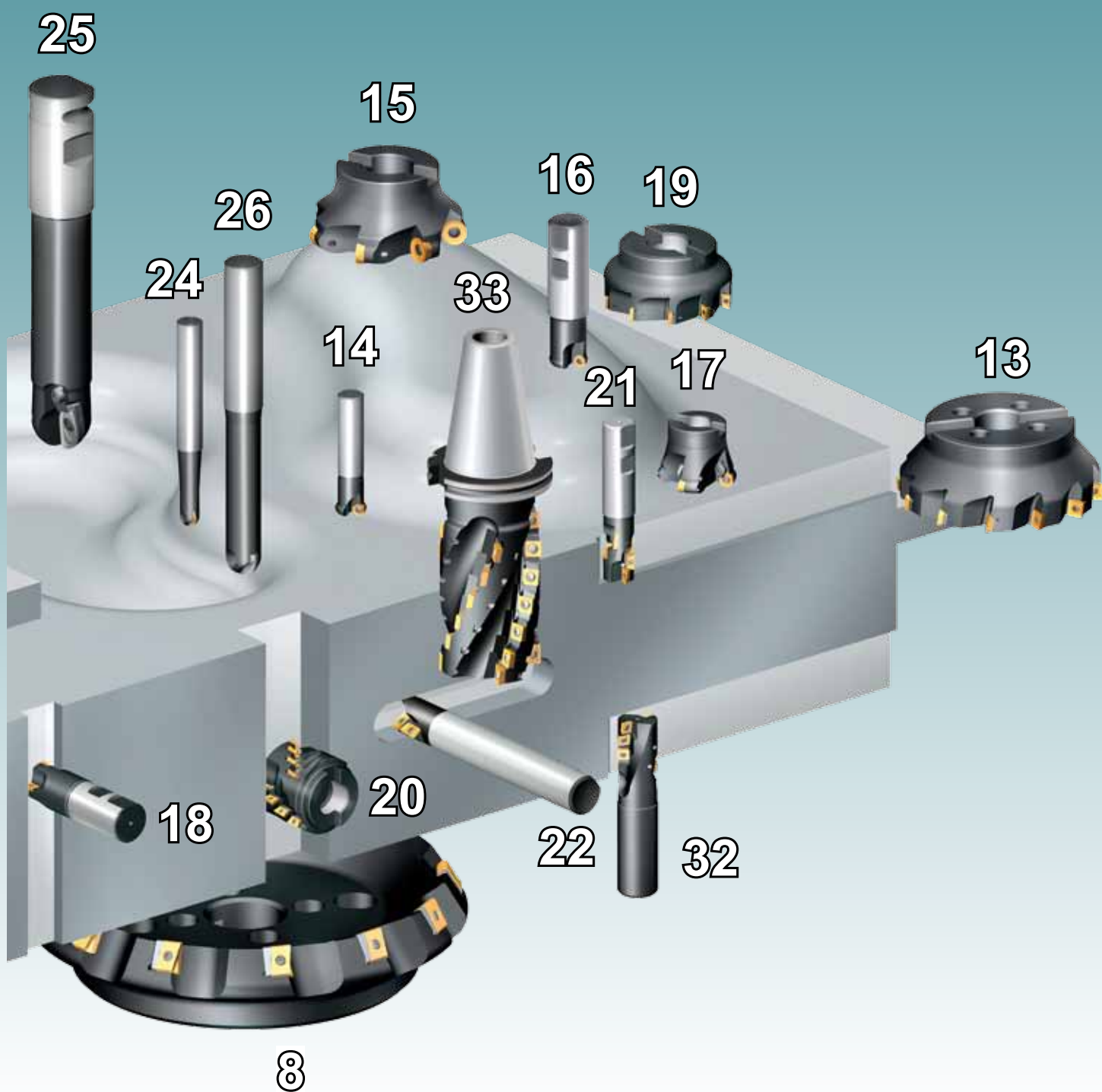
## Indexable Milling Tools · Wendeplattenfräser

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# Indexable milling tool Program Wendeplatten Fräsprogramm



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## General Technical Information · Allgemeine Technische Informationen

Serie	Approach Angle / max. depth of cut Einstellwinkel/ max. Schnitttiefe	Insert WSP	Application Anwendung	Features Merkmale
<b>FMA01</b>    B26	$K_r=45^\circ$ $a_{pmax}=6.0$	SEET12T3-DF/DM/DR SEET12T3-CF/CM/CR SEET12T3-EF/EM SEET12T3-LH SEET12T3-W	General face milling of: Steel, alloy steel, stainless steel, cast iron, aluminium alloy, high temperature alloy  Allgemeines Planfräsen von: Stahl, leg. Stahl, rostfr. Stahl, Grauguss, Alu.-legierungen, hochtemperaturbeständige Legierungen	<ul style="list-style-type: none"> <li>• Diameter range Ø50-Ø315</li> <li>• Large rake angle makes cutting more light and fast</li> <li>• Wide applications by using available inserts with different chipbreaker</li> <li>• Adopting wiper inserts improve surface quality</li> <li>• Durchmesserbereich: 50 – 315 mm weichschneidende Fräser mit großer, positiver Schneidengeometrie.</li> <li>• Großes Anwendungsgebiet durch unterschiedliche Spanbrecherausführung</li> <li>• Wiper-Wendeschneidplatten für beste Oberflächenqualität</li> </ul>
		SEET12T3-DF/DM/DR SEET12T3-CF/CM/CR SEET12T3-EF/EM SEET12T3-LH SEET12T3-W	General face milling of: Steel, alloy steel, stainless steel, cast iron, aluminum alloy, high temperature alloy  Allgemeines Planfräsen von: Stahl, leg. Stahl, rostfr. Stahl, Grauguss, Alu.-legierungen, hochtemperaturbeständige Legierungen	<ul style="list-style-type: none"> <li>• Diameter range Ø50-Ø125</li> <li>• Large rake angle makes cutting more light and fast</li> <li>• Wide applications by using available inserts with different chipbreaker</li> <li>• Coarse and differential pitch, reduce vibration.</li> <li>• Durchmesserbereich: 50 – 125 mm weichschneidende Fräser mit großer, positiver Schneidengeometrie.</li> <li>• Großes Anwendungsgebiet durch unterschiedliche Spanbrecherausführung</li> <li>• Weite und Differential Teilung zur Vermeidung von Vibrationen</li> </ul>
<b>FMA03</b>    B31	$K_r=45^\circ$ $a_{pmax}=5.5$	SE**N1203AF** SE**R1203AF**	General face milling of steel, stainless steel, cast iron  Allgemeine Planfräsbear. von Stahl, rostfr. Stahl und Grauguss	<ul style="list-style-type: none"> <li>• Diameter range Ø80-Ø315</li> <li>• Large rake angle makes cutting more light and fast</li> <li>• Top clamping reduces vibrations</li> <li>• Durchmesserbereich: 80 – 315 mm weichschneidende Fräser mit großer, positiver Schneidengeometrie.</li> <li>• Großes Anwendungsgebiet durch unterschiedliche Spanbrecherausführung stabile</li> <li>• Top Klemmung zur Vermeidung von Vibrationen</li> </ul>
	$K_r=45^\circ$ $a_{pmax}=7.5$	SE**N1504AF** SE**R1504AF**	Face milling of steel, alloy steel, cast iron, aluminum alloy  Planfräsen von Stahl, leg. Stahl und Grauguss	
<b>FMA04</b>    B34	$K_r=45^\circ$ $a_{pmax}=3.5$	OFKT05T3-DF/DM OFKT05T3-LH	Face milling of steel, alloy steel and cast iron  Planfräsen von Stahl, leg. Stahl und Grauguss	<ul style="list-style-type: none"> <li>• Diameter range Ø125-Ø315</li> <li>• High economy milling tool with 8 cutting edges</li> <li>• Top clamping is easy to assemble and disassemble</li> <li>• Durchmesserbereich: 125 – 315 mm</li> <li>• Hochwirtschaftlicher Fräser mit 8 Schneidkanten/Wendeschneidplatten</li> <li>• Schraubenklemmung mit hoher Präzision.</li> <li>• Top Klemmung zum leichteren Plattenwechsel</li> </ul>
		$K_r=45^\circ$ $a_{pmax}=5.0$	OFKR0704-DF/DM	
<b>FMA05</b>    B41	$K_r=45^\circ$ $a_{pmax}=5.0$	SNKN1204ENN	Face milling cast iron  Planfräsen von Grauguss	<ul style="list-style-type: none"> <li>• Diameter range Ø200-Ø450</li> <li>• Extra close pitch milling tool, rapid feed rate</li> <li>• Double negative rake angle, high cutting edge strength</li> <li>• High economy milling tool with 8 cutting edges</li> <li>• Durchmesserbereich: 200 – 450 mm</li> <li>• Extra enge Teilung für hohe Vorschübe. Doppelt neg. Winkel für hohe Schneidkanten-Stabilität</li> <li>• Hochwirtschaftlicher Fräser mit 8 Schneidkanten/Wendeschneidplatten</li> <li>• Schraubenklemmung mit hoher Präzision</li> <li>• Hochwirtschaftlicher Fräser mit 8 Schneidkanten/Wendeschneidplatten</li> </ul>
		$K_r=45^\circ$ $a_{pmax}=5.5$		

Face milling · Planfräsen

B

Milling Tools · Fräser

# Milling - Fräsen

General Technical Information - Allgemeine Technische Informationen

B

Milling Tools - Fräser

Face milling - Planfräser






Serie	Approach Angle / max. depth of cut Einstellwinkel/ max. Schnitttiefe	Insert WSP	Application Anwendung	Features
<b>FMD02</b>  B43	Kr=58° a <sub>pmax</sub> =4.0	HNEXT090512-DF/DM HNEXT090512-DR HNEXT090516-DR	Face milling of cast iron  Planfräsen von Grauguss	<ul style="list-style-type: none"> <li>Diameter range Ø80-Ø315</li> <li>New milling tool generation for higher feed rate</li> <li>High economy milling tool with 12 cutting edges</li> <li>Top clamping is easy to assemble and disassemble</li> </ul> <ul style="list-style-type: none"> <li>Durchmesserbereich: 80 – 315 mm</li> <li>Neue Fräsgeneration für hohe Vorschübe</li> <li>Hochwirtschaftliche Fräser mit 12 Schneidkanten/ Wendeschneidplatten</li> </ul>
<b>FMD02</b>  B45	Kr=67° a <sub>pmax</sub> =3.5	PNEG110512R-CF PNEG110512R-CR	Face milling of cast iron  Planfräsen von Grauguss	<ul style="list-style-type: none"> <li>Diameter range Ø50-Ø160</li> <li>Cutting edges for low cutting force</li> <li>With wiper for good surface quality</li> <li>High economy milling tool with 10 cutting edges</li> </ul> <ul style="list-style-type: none"> <li>Durchmesserbereich: 50 – 160 mm</li> <li>Spezielle Schneidkante für niedrige Schnittkräfte</li> <li>Mit Wiper-Fase für gute Oberflächengüten</li> <li>Hoch wirtschaftlich durch doppelte 10 Schneiden Platte</li> </ul>
<b>FMD03</b>  B47	Kr=60° a <sub>pmax</sub> =12.0	LNKT2007DN-ZR	Heavy-duty face milling of steel, alloy steel and cast iron	<ul style="list-style-type: none"> <li>Diameter range Ø125-Ø400</li> <li>Double positive rake angle reduces the cutting force</li> <li>Suitable for heavy machining with big cutting depth</li> <li>Easy to assemble and clamp inserts</li> </ul>
	Kr=60° a <sub>pmax</sub> =17.0	LNKT2510-ZR	Schwerzerspannungsfräsen von Stahl, leg. Stahl und Grauguss	<ul style="list-style-type: none"> <li>Durchmesserbereich: 125 – 400 mm</li> <li>Doppelt positive Schneidwinkel zur Reduzierung der Schnittkräfte</li> <li>Anwendung zur Schwerzerspannung bei hohen Schnitttiefen</li> <li>Einfache und stabile Wendeschneidplatten-Klemmung</li> </ul>
<b>FME01</b>  B50	Kr=75° a <sub>pmax</sub> =8.0	LNE32.534	Face milling of cast iron  Planfräsen von Grauguss	<ul style="list-style-type: none"> <li>Diameter range Ø125-Ø315</li> <li>Close pitch milling tools</li> <li>Suitable for face milling of cast iron parts on large-power machines.</li> </ul> <ul style="list-style-type: none"> <li>Durchmesserbereich: 125 – 315 mm</li> <li>Enge Teilung</li> <li>Einsatz: zum Planfräsen von Grauguss Werkstücken auf stabilen Maschinen</li> </ul>
<b>FME02</b>  B52	Kr=75° a <sub>pmax</sub> =6.0	SPKW1204EDFR SPKW1204EDSR SPKT1204EDR	Face milling of steel, alloy of steel and cast iron  Planfräsen von Stahl, leg. Stahl und Grauguss	<ul style="list-style-type: none"> <li>Diameter range Ø50-Ø125</li> <li>Kr 75°, general face milling</li> <li>Wide applications by using inserts with different chipbreakers</li> </ul> <ul style="list-style-type: none"> <li>Durchmesserbereich: 50 – 125 mm</li> <li>Anstellwinkel 75 Grad,</li> <li>allgemeines Planfräsen</li> <li>weites Anwendungsgebiet durch Einsatz von Wendeschneidplatten mit unterschiedlichen Spanbrechern</li> </ul>
<b>FME03</b>  B54	Kr=75° a <sub>pmax</sub> =6.0	SP*N1203(1504)ED** SP*R1203(1504)ED**	General face milling of steel, alloy steel and cast iron	<ul style="list-style-type: none"> <li>Diameter range Ø80-Ø315</li> <li>Kr 75°, general face milling</li> <li>Top clamping is easy to assemble and disassemble</li> </ul>
	Kr=75° a <sub>pmax</sub> =8.0	SP*N1504ED** SP*R1504ED**	Allgemeines Planfräsen von Stahl, leg. Stahl und Grauguss	<ul style="list-style-type: none"> <li>Durchmesserbereich: 80 – 315 mm</li> <li>Einstellwinkel 75 Grad zum allgemeinen Planfräsen</li> <li>Top Klemmsystem zum einfachen Wendeschneidplattenwechsel.</li> </ul>
<b>FME04</b>  B58	Kr=75° a <sub>pmax</sub> =8.0	LNKT1506EN-ZR	Heavy-duty face milling of steel and alloy steel  Schwerzerspannungsfräsen von Stahl und leg. Stahl	<ul style="list-style-type: none"> <li>Diameter range Ø125-Ø315</li> <li>Kr 75°, heavy face milling</li> <li>with 4 cutting edges</li> </ul> <ul style="list-style-type: none"> <li>Durchmesserbereich: 125 – 315 mm</li> <li>Kr 75°, Planfräsen mit hohen Abtragraten</li> <li>4 Schneidkanten</li> </ul>

# Milling · Fräsen

## General Technical Information · Allgemeine Technische Informationen

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Milling Tools · Fräser






Face milling · Planfräsen		Serie	Approach Angle / max. depth of cut Einstellwinkel/ max. Schnitttiefe	Insert WSP	Application Anwendung	Features Merkmale	
	B60	<b>FMP01</b>	Kr=90° a <sub>pmax</sub> =18.0	TP*N2204PD* TPKN2204PDF* TPKN2204PDT*	Face milling of steel, alloy steel and cast iron  Planfräsen von Stahl, leg. Stahl und Grauguss	<ul style="list-style-type: none"> <li>• Diameter range Ø80-Ø315</li> <li>• Kr 90°, square shoulder milling</li> <li>• Top clamping is easy to assemble and disassemble</li> </ul> <ul style="list-style-type: none"> <li>• Durchmesserbereich: 80 – 315 mm</li> <li>• Einstellwinkel 90 Grad zum allgemeinen Planfräser</li> <li>• Top Klemmsystem zum einfachen Wendeschneidplattenwechsel.</li> </ul>	
			Kr=90° a <sub>pmax</sub> =6.7	SEET09T308PER-PF/PM SEET09T308PER-PR	Face milling steel, alloy steel, stainless steel and cast iron	<ul style="list-style-type: none"> <li>• Diameter range Ø50-Ø315</li> <li>• Kr 90°, for square shoulder milling and face milling</li> <li>• Different pitch design: coarse pitch, close pitch and extra close pitch</li> <li>• High precision insert for, high surface quality</li> <li>• Optimized chipbreaker and grade, for finish machining, semi-finish machining and rough machining.</li> </ul>	
	B62	<b>FMP02</b>	Kr=90° a <sub>pmax</sub> =10.8	SEET120308PER-PF/PM SEET120308PER-PR	Plan- und Eckfräsen von Stahl, leg. Stahl, rostfr. Stahl und Grauguss	<ul style="list-style-type: none"> <li>• Durchmesserbereich: 50 – 315 mm</li> <li>• Einstellwinkel 90 Grad zum Eck- und Planfräsen</li> <li>• Unterschiedliche Teilung: weit, eng und extra eng</li> <li>• Präzisionsschneidplatten zur Erzielung hoher Oberflächenqualität</li> <li>• Optimale Spanbrecher und Hartmetallsorten zum Schlichten, mittlere Bearbeitung und Schruppen.</li> </ul>	
			Kr=90° a <sub>pmax</sub> =8	LNKT1506EN-ZR	Heavy Duty face milling steel, alloy steel, stainless steel and cast iron	<ul style="list-style-type: none"> <li>• Diameter range Ø125-Ø315</li> <li>• Kr 90°, for square shoulder milling and face milling with big cutting depth</li> <li>• positive rake reduces the cutting force</li> <li>• Durchmesserbereich: 125 – 315 mm</li> <li>• Einstellwinkel 90 Grad zum Schulter- und Planfräsen mit großer Schnitttiefe</li> <li>• Positiver Spanwinkel für weniger Schnittkräfte</li> </ul>	
			a <sub>pmax</sub> =12	LNKT2007DN-ZR	Schwerzerspannung von Stahl, leg. Stahl, rostfr. Stahl und Grauguss	<ul style="list-style-type: none"> <li>• Durchmesserbereich: 125 – 315 mm</li> <li>• Einstellwinkel 90 Grad zum Schulter- und Planfräsen mit großer Schnitttiefe</li> <li>• Positiver Spanwinkel für weniger Schnittkräfte</li> </ul>	
	B68	<b>FMP03</b>	a <sub>pmax</sub> =15	LNKT2510-ZR			
			<b>FMR01</b>	a <sub>pmax</sub> =5.0	RCKT10T3MO-DM	Cavity profile milling of steel, alloy steel, stainless steel and cast iron	<ul style="list-style-type: none"> <li>• Diameter range Ø25-Ø50</li> <li>• R-type inserts possess stronger cutting edges</li> <li>• Suitable for machining curved surface of mould</li> <li>• Economical milling cutters with screw clamping</li> </ul>
			a <sub>pmax</sub> =6.0	RCKT1204MO-DM/DR	Formfräsen von Stahl, leg. Stahl, rostfr. Stahl und Grauguss	<ul style="list-style-type: none"> <li>• Durchmesserbereich: 25 – 50 mm</li> <li>• Radiusfräser mit stabiler Schneidkante</li> <li>• Einsatz zur Bearbeitung von Formen und Gesenken</li> <li>• Wirtschaftliche Fräser mit Schraubenklemmung</li> </ul>	
	B73	<b>FMR02</b>	a <sub>pmax</sub> =6.0	RCKT1204MO-DM/DR	Face milling and cavity profile milling of steel, alloy steel, stainless steel and cast iron	<ul style="list-style-type: none"> <li>• Diameter range Ø63-Ø200</li> <li>• R-type inserts possess stronger cutting edges</li> <li>• Suitable for machining curved surface of mould</li> <li>• Economical milling tools with screw clamping</li> </ul>	
			a <sub>pmax</sub> =8.0	RCKT1606MO-DM/DR		<ul style="list-style-type: none"> <li>• Durchmesserbereich: 63 – 200 mm</li> <li>• Radiusfräser mit stabiler Schneidkante</li> <li>• Einsatz zur Bearbeitung von Formen und Gesenken</li> <li>• Wirtschaftliche Fräser mit Schraubenklemmung</li> </ul>	
			a <sub>pmax</sub> =10.0	RCKT2006MO-DR	Plan- und Formfräsen von Stahl, leg. Stahl, rostfreier Stahl und Grauguss		
	B75	<b>FMR03</b>	a <sub>pmax</sub> =3.5	RDKW0702MO	Cavity profile milling of steel, alloy steel, stainless steel and cast iron	<ul style="list-style-type: none"> <li>• Diameter range Ø25-Ø50</li> <li>• R-type inserts possess stronger cutting edges</li> <li>• Suitable for machining curved surface of mould</li> <li>• Economical milling tools with screw clamping</li> </ul>	
			a <sub>pmax</sub> =4.0	RDKW0803MO			
			a <sub>pmax</sub> =5.0	RDKW1003MO RDKW10T3MO	Formfräsen von Stahl, leg. Stahl, rostfreier Stahl und Grauguss	<ul style="list-style-type: none"> <li>• Durchmesserbereich: 25 – 50 mm Radiusfräser mit stabiler Schneidkante</li> <li>• Einsatz zur Bearbeitung von Formen und Gesenken</li> <li>• Wirtschaftliche Fräser mit Schraubenklemmung</li> </ul>	
			a <sub>pmax</sub> =6.0	RDKW12T3MO RDKW1204MO			

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	Serie	Approach Angle / max. depth of cut Einstellwinkel/ max. Schnitttiefe	Insert WSP	Application Anwendung	Features Merkmale
Face milling Planfräsen	<b>FMR04</b>  	$a_{pmax}=6.0$	RDKW1204MO RDKW12T3MO	Face milling and cavity profile milling of steel, alloy steel, stainless steel and cast iron	<ul style="list-style-type: none"> <li>• Diameter range Ø50-Ø160</li> <li>• R-type inserts possess stronger cutting edge</li> <li>• Suitable for machining curved surface of mould</li> </ul>
		$a_{pmax}=8.0$	RDKW1605MO RDKW1604MO		
		$a_{pmax}=10.0$	RDKW2006MO	Plan- und Formfräsen von Stahl, leg. Stahl, rostfreier Stahl und Grauguss	<ul style="list-style-type: none"> <li>• Durchmesserbereich: 50 – 160 mm</li> <li>• Radiusfräser mit stabiler Schneidkante</li> <li>• Einsatz zur Bearbeitung von Formen und Gesenken</li> <li>• Wirtschaftliche Fräser mit Schraubenklemmung</li> </ul>
Square shoulder milling · Eckfräsen	<b>EMP01</b>  	$K_r=90^\circ$ $a_{pmax}=10.5$	APKT11T3**-PF/PM/ PR APKT11T3**-LH	Multi-function milling of steel, alloy steel, stainless steel, cast iron and Al alloy	<ul style="list-style-type: none"> <li>• Two mounting modes: Straight shank and Weldon shank, Diameter range Ø12-Ø63</li> <li>• <math>K_r 90^\circ</math>, for square shoulder milling, slot milling, ramp milling etc.</li> <li>• Wiper inserts also suitable for face milling.</li> <li>• Inserts with 3D helical cutting edge, less cutting force</li> </ul>
		$K_r=90^\circ$ $a_{pmax}=15.5$	APKT160408- PF/PM/ PR APKT160408-LH		
	<b>EMP02</b>  	$K_r=90^\circ$ $a_{pmax}=10.5$	APKT11T3**- PF/PM/ PR APKT11T3**-LH	Face milling of steel, alloy steel, stainless steel, cast iron and Al alloy	<ul style="list-style-type: none"> <li>• Diameter range Ø50-Ø100</li> <li>• <math>K_r 90^\circ</math>, for square shoulder milling</li> <li>• Wiper inserts also suitable for face milling.</li> <li>• Inserts with 3D helical cutting edge, less cutting force</li> </ul>
		$K_r=90^\circ$ $a_{pmax}=15.5$	APKT160408- PF/PM/ PR APKT160408-LH		
	<b>EMP03</b>  	$K_r=90^\circ$ $a_{pmax}=39.0$	APKT11T3**-PF/PM/ PR APKT11T3**-LH	Adopting large cutting depth, for milling of steel, alloy steel, stainless steel, cast iron and Al alloy	<ul style="list-style-type: none"> <li>• End milling tools with positive helical angle, good chip removal</li> <li>• For side face milling and slot machining</li> <li>• Close pitch, high machining efficiency.</li> </ul>
<b>EMP04</b>  	$K_r=90^\circ$ $a_{pmax}=58.0$	APKT11T3**-PF/PM/ PR APKT11T3**-LH	Adopting large cutting depth, for milling steel, alloy steel, stainless steel, cast iron and Al alloy	<ul style="list-style-type: none"> <li>• End milling tools with positive helical angle, good chip removal</li> <li>• For side face milling and slot machining</li> <li>• Close pitch, high machining efficiency.</li> </ul>	
					Fräsen mit großen Schnitttiefen von Stahl, leg. Stahl, rostfr. Stahl, Grauguss und leg. Alu
					<ul style="list-style-type: none"> <li>• Durchmesserbereich: 20 – 40 mm</li> <li>• Schaftfräser mit pos. Zirkularwinkel und guter Spanabfuhr</li> <li>• Eck- und Nutenfräsen</li> <li>• Enge Teilung zur Erreichung hoher Bearbeitungswirtschaftlichkeit.</li> </ul>

# Milling · Fräsen

## General Technical Information · Allgemeine Technische Informationen











	Serie	Approach Angle / max. depth of cut Einstellwinkel/ max. Schnitttiefe	Insert WSP	Application Anwendung	Features Merkmale
Square shoulder milling Eckfräsen	<b>EMP05</b>  B98	Kr=90° a <sub>p</sub> max=40.0	APMT1135PDR APMT160408PDER	Multi-function drilling and milling steel alloy steel, stainless steel and cast iron  Multi- Funktionsbohren und Fräsen von Stahl, leg. Stahl, rostfr. Stahl und Grauguss	<ul style="list-style-type: none"> <li>• Diameter range Ø25-Ø40</li> <li>• End edge over center, for drilling directly</li> <li>• Durchmesserbereich: 25 – 40 mm</li> <li>• Zentrum-Schneide (über Mitte) zum Bohren.</li> </ul>
	<b>BMR01</b>  B100		ZDET**CYR** ZPNT2204CYR** SPMT060304 SDMT**	Profile machining of steel, stainless steel and cast iron  Formfräsen von Stahl, rostfreiem Stahl und Grauguss.	<ul style="list-style-type: none"> <li>• Diameter range Ø20-Ø63</li> <li>• Very suitable for rough machining large mold</li> <li>• Ball nose cutter with 3-cutting-edges inserts, perfect economical efficiency</li> <li>• Durchmesserbereich: 20 – 63 mm</li> <li>• Besonders geeignet für die Schruppbearbeitung von großen Formen</li> <li>• Radiusfräser mit 3 Schneidkanten pro Schneidplatte.</li> <li>• Hohe Wirtschaftlichkeit</li> </ul>
Profile milling · Formfräsen	<b>BMR02</b>  B103	Cutting depth: see the detailed information about tool specifications  Schnitttiefe: siehe detaillierte info: in der Werkzeug spezifikation.	ROHX**	Profile machining of steel, stainless steel and cast iron  Formfräsen von Stahl, rostfreiem Stahl und Grauguss.	<ul style="list-style-type: none"> <li>• Diameter range Ø12-Ø20</li> <li>• Applied for profile finish machining</li> <li>• Good assembly stability.</li> <li>• Insert with two cutting edges, perfect economical efficiency.</li> <li>• Durchmesserbereich: 12 – 20 mm</li> <li>• Schlichtbearbeitung von Formen</li> <li>• Hohe Fräserstabilität</li> <li>• Schneidplatte mit 2 Schneidkanten</li> <li>• Hohe Wirtschaftlichkeit</li> </ul>
	<b>BMR03</b>  B105 B106 B107 B108		XPHT**R** - GM	Profile machining of steel, stainless steel and cast iron  Formfräsen von Stahl, rostfreiem Stahl und Grauguss.	<ul style="list-style-type: none"> <li>• Diameter range Ø16-Ø50</li> <li>• Very suitable for rough machining moulds</li> <li>• Equipped with 3D chipbreaker inserts, high circular edge precision.</li> <li>• Tool body with high rigidity</li> <li>• Durchmesserbereich: 16 – 50 mm</li> <li>• Besonders geeignet für das Schruppfräsen von Formen.</li> <li>• 3-D Spanbrecher für hohe Rundlaufgenauigkeit</li> <li>• Werkzeugkörper mit hoher Stabilität</li> </ul>








# Milling - Fräsen

General Technical Information - Allgemeine Technische Informationen

B

Milling Tools - Fräser

	Serie	Approach Angle / max. depth of cut Einstellwinkel/ max. Schnitttiefe	Insert WSP	Application Anwendung	Features Merkmale	
Profile milling Formfräsen	<b>BMR04</b>  B117  B118		ZOHX**	Profile machining of steel, stainless steel and cast iron  Formfräsen von Stahl, rostfreiem Stahl und Grauguss.	<ul style="list-style-type: none"> <li>• Diameter range Ø10-Ø40</li> <li>• High precision, for finish profile machining.</li> <li>• Two types of chipbreaker, used at different machining condition</li> <li>• High assembling precision, good stability.</li> </ul> <ul style="list-style-type: none"> <li>• Durchmesserbereich: 10 – 40 mm</li> <li>• Hohe Präzision zur Fertigbearbeitung beim Formfräsen.</li> <li>• 2 Spanbrechergeometrien für unterschiedliche Anwendungen</li> <li>• Hohe Fräserstabilität und Präzision.</li> </ul>	
	<b>SMP01</b>  B125  B126	Cutting depth: see the detailed information about tool specifications  Schnitttiefe: siehe detaillierte info: in der Werkzeug spezifikation.		XSEQ12**	Slot milling of steel, stainless steel and cast iron.  Nutenfräsen von Stahl und Grauguss	<ul style="list-style-type: none"> <li>• Diameter range Ø100-Ø250</li> <li>• Two mounting types: mounting by keyway and Arbor</li> <li>• Groove width range : 4, 5, 6, 7, 8mm</li> </ul> <ul style="list-style-type: none"> <li>• Durchmesser Bereich Ø100-Ø250</li> <li>• Zwei Aufnahme Typen : Längsnut und Quernut</li> <li>• Nutenbreiten Bereich : 4, 5, 6, 7, 8mm</li> </ul>
<b>SMP03</b>  B129  B130	MPHT**			Slot milling of steel, stainless steel and cast iron.  Nutenfräsen von Stahl und Grauguss	<ul style="list-style-type: none"> <li>• Diameter range Ø80-Ø250</li> <li>• Two mounting types: mounting by keyway and Arbor</li> <li>• Groove width range : 4, 5, 6, 7, 8mm</li> </ul> <ul style="list-style-type: none"> <li>• Durchmesser Bereich Ø80-Ø250</li> <li>• Zwei Aufnahme Typen : Längsnut und Quernut</li> <li>• Nutenbreiten Bereich : 4, 5, 6, 7, 8mm</li> </ul>	
Special milling (high feed) Spezialfräsen für hohe Vorschube	<b>XMR01</b>  B132  B132  B135  B136	Cutting depth: see the detailed information about tool specifications  Schnitttiefe: siehe detaillierte info: in der Werkzeug spezifikation.		SDMT** -DM	Face and profile milling of steel, stainless steel and cast iron in cavity applications  Plan- und Formfräsen von Stahl, rostfreiem Stahl und Grauguss	<ul style="list-style-type: none"> <li>• Diameter range Ø25-Ø100</li> <li>• Two mounting types: Straight shank and Arbor</li> <li>• The cutting forces are decomposed effectively, realize cutting with high feed rate.</li> <li>• For plunge milling</li> <li>• Double clamping, firm and reliable.</li> </ul> <ul style="list-style-type: none"> <li>• Durchmesser Bereich Ø25-Ø100</li> <li>• als Schaft- und Aufsteckfräser</li> <li>• Die Schnittkräfte werden axial konzentriert. Der Fräser ist für hohe Vorschübe geeignet.</li> <li>• Tauchfräsen möglich.</li> <li>• Doppeltes Klemmsystem für WSP.</li> </ul>
				WPGT**ZSR	Face and profile milling of steel, stainless steel and cast iron in cavity applications  Plan- und Formfräsen von Stahl, rostfreiem Stahl und Grauguss	<ul style="list-style-type: none"> <li>• Diameter range Ø20-Ø100</li> <li>• Two mounting types: Straight shank and Arbor</li> <li>• The cutting forces are decomposed effectively, realize cutting with high feed rate.</li> <li>• Double clamping, firm and reliable.</li> </ul> <ul style="list-style-type: none"> <li>• Durchmesser Bereich Ø25-Ø100</li> <li>• als Schaft und Aufsteckfräser</li> <li>• Die Schnittkräfte werden axial konzentriert. Der Fräser ist für hohe Vorschübe geeignet.</li> <li>• Doppeltes Klemmsystem für WSP.</li> </ul>

	Serie	Approach Angle / max. depth of cut Einstellwinkel/ max. Schnitttiefe	Insert WSP	Application Anwendung	Features Merkmale
T-slot milling T-Nutenfräsen	<b>TMP01</b>  B140	Kr=90°	MPHT**	Machining T slot in cast iron  T-Nuten von Gusseisen	<ul style="list-style-type: none"> <li>• Diameter range Ø21-Ø60</li> <li>• Machining the T-slot with size range 12, 14, 18, 22, 28, 36 mm.</li> <li>• 86° rhombic inserts with positive angle.</li> <li>• Durchmesser Bereich Ø21-Ø60</li> <li>• T-Nutenfräsen im Bereich von 12, 14, 18, 22, 28, 36mm.</li> <li>• 86° rhombische WSP mit positivem Winkel.</li> </ul>
Helical end mills · Walzenstirnfräser	<b>HMP01</b>  B141	Kr=90° a <sub>pmax</sub> =55	APKT150412-** SPMT120408-**	Milling of steel, alloy steel and cast iron with large cutting depth.  Fräsen von Stahl, leg. Stahl und Grauguss. Bei großen Schnitttiefen.	<ul style="list-style-type: none"> <li>• Diameter range Ø40-Ø80</li> <li>• Coarse and differential pitch, less vibration</li> <li>• Holistic structure with good rigidity, interchangeable heads achieve high economical efficiency.</li> <li>• Durchmesser Bereich Ø40-Ø80</li> <li>• Weite und normale Teilung, weniger Vibrationen</li> <li>• Holistic Struktur mit hoher Stabilität, austauschbare Fräsköpfe für hohe Effizienz und Wirtschaftlichkeit.</li> </ul>
	 B142-143	Kr=90° a <sub>pmax</sub> =144			
	<b>HMP01 EC</b>  B144	Kr=90° a <sub>pmax</sub> =144			
Chamfer milling · Fasenfräser	<b>CMZ01</b>  B147	Kr=30°	SPMT120408	Chamfer machining of steel, alloy steel, stainless steel and cast iron  Fasenfräsen von Stahl, leg. Stahl, rostfreiem Stahl und Gusseisen	<ul style="list-style-type: none"> <li>• Diameter range Ø12, Ø25, Ø32, Ø36</li> <li>• With the function of milling small surface</li> <li>• Durchmesser Bereich Ø12, Ø25, Ø32, Ø36</li> <li>• Einsatz bei kleinen Flächen</li> </ul>
	<b>CMA01</b>  B148	Kr=45°			
	<b>CMD01</b>  B149	Kr=60°			





Comparison table for milling Insert - Grades  
Fräswendepplatten Übersichtstabelle - Sorten

Workpiece material	ISO	Coating · Beschichtung		Cermet	Cemented Carbide	PCBN & PCD PCBN & PKD
		CVD	PVD			
<b>P</b> Steel · Stahl	P01					
	P10		YBG202 YBG205 YBG252	YNG151 YNG151C		
	P20	YBC301 YBM251				
	P30	YBM351 YBC401			YC30S	
	P40		YBG302			
<b>M</b> Stainless Steel Rostfreier Stahl	M01					
	M10		YBG202 YBG205 YBG252	YNG151 YNG151C		
	M20	YBM251				
	M30	YBM351			YC30S	
	M40	YBM351	YBG302			
<b>K</b> Cast Iron · Grauguss	K01		YBG102			YCB011 YCB211
	K10	YBD152	YBG202	YNG151 YNG151C	YD051	
	K20	YBD252	YBG152		YD201	
	K30					
	K40					
<b>N</b> Hardened material Gehärtete Werkstoffe	N01					YCD011
	N10				YD101	
	N20				YD201	
	N30					
<b>S</b> Heat-resistant steel Warmfester Stahl	S01					
	S10		YBG202			
	S20					
	S30					
<b>H</b> Non-ferrite materials Ne Metalle	H01					YCB012 YCB211
	H10					
	H20					
	H30					

# Milling · Fräsen

General Technical Information · Allgemeine Technische Informationen

## Coated Cemented Carbide CVD Beschichtetes Hartmetall CVD

Grade · Sorte	Coating · Beschicht.	Micro-Structure	ISO	Application Anwendung
<b>YBC301</b>	Substrate with high strength, in combination with MT-Ti(CN), thin layer Al <sub>2</sub> O <sub>3</sub> and TiN Coating. Beschichtetes Hartmetall mit hoher Schneidkantensicherheit. In Kombination mit TiCN Al <sub>2</sub> O <sub>3</sub> , und TiN.		<b>P15~35</b>	Suitable for light and midium milling of low alloy steel and non alloy steel, even under unfavorable condition. Gut geeignet für leichte bis mittlere Fräsbearbeitung von niedriglegierten Stählen unter schwierigen Bedingungen.
<b>YBC401</b>	Substrate with excellent toughness, in combination with Ti(CN), thin layer Al <sub>2</sub> O <sub>3</sub> , TiN. CVD beschichtetes Hartmetall mit einer guten Wärmeleitfähigkeit.		<b>P25~50</b> <b>M20~40</b>	It is suitable for medium to heavy milling steels and stainless steel. Zum Fräsen von rostfreiem Stahl, warmfestem
<b>YBM251</b>	Substrate with good toughness and strength, in combination with Ti(CN), thin layer Al <sub>2</sub> O <sub>3</sub> , TiN. Universal einsetzbares CVD-beschichtete Hartmetallsorte aus TiN +MT-TiCN + dünner Al <sub>2</sub> O <sub>3</sub> + TiN mit guter Zähigkeit und Verschleißfestigkeit.		<b>P15~40</b> <b>M10~30</b>	Good performance in milling of alloy steel and stainless steel. Gute Eigenschaft zum Fräsen von legiertem und rostfreiem Stahl.
<b>YBM351</b>	MT-TiCN+Al <sub>2</sub> O <sub>3</sub> coated carbide grade with very good strength and impact resistance. Beschichtete Hartmetallsorte MT-TiCN+Al <sub>2</sub> O <sub>3</sub> mit ausgezeichneter Widerstandsfähigkeit und Schneidkantensicherheit.		<b>P25~40</b> <b>M20~40</b>	It is for milling of alloy steel and stainless steel. Zum Fräsen von legiertem und rostfreiem Stahl
<b>YBD152</b>	Hard medium fine corn Substrate in combination with TiCN, thick Al <sub>2</sub> O <sub>3</sub> coating. Hartes mittel-feinkörniges Subtrat mit TiCN, dicker Al <sub>2</sub> O <sub>3</sub> Beschichtung.		<b>K05~25</b>	It is suitable for machining of gray cast iron and nodular cast iron under normal cutting conditions from low to moderate cutting speeds. Bearbeitung von Guss und Kugelgraphitguss mit niedrigen bis mittleren Schnittgeschwindigkeiten.
<b>YBD252</b>	Tough substrate in combination with TiN, TiCN, thick Al <sub>2</sub> O <sub>3</sub> coating. For milling of cast iron and alloy steel. Zähes Subtrat mit TiCN, dicke Al <sub>2</sub> O <sub>3</sub> Beschichtung.		<b>K15~35</b>	For milling of cast iron and alloy steel. Zum Fräsen von Grauguss und legiertem Stahl.

B

# Milling - Fräsen

General Technical Information · Allgemeine Technische Informationen

**B**

Milling Tools · Fräser

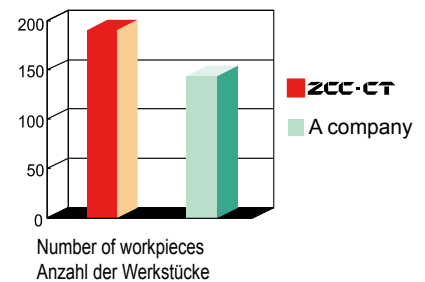
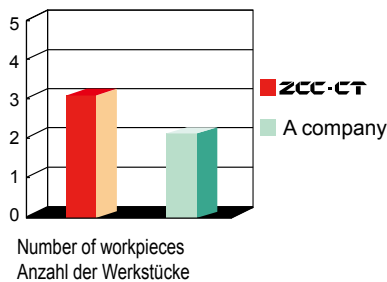
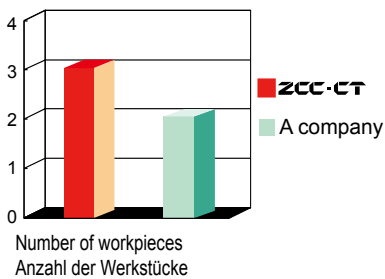
## Application Anwendung

Component  
Werkstück



Machine Maschine	NC milling machine, wet machining NC Fräsmaschine, Kühlung	Verti. machining center, dry machining Verticales Bearb.-center, trocken	Horizontal mach. center, dry mach. Horizontales Bearb.-center, trocken
Workp. material & hardness Werkstückstoff & Härte	Casting stainless steel HB220-260 rostfreier Stahlguss	45 Forged steel HB240-270 Kohlenstoffstahl	HT250* HB220
Type of machining Bearbeitung	Face milling Planfräser	Face milling Planfräser	Face milling Planfräser
Milling tool Fräswerkzeug	FMA04-200-C60-OF07-12	FMA01-125-B40-SE12-08	FMP02-100-B32-SE12-07
Applicable insert Fräsplatte	YBM251/OFKR0704-DM	YBM351/SEET12T3-DR	YBD252/SEET120308PER-PM
Cutting data Schnittdaten	Vc=120m/min, fz=0.15mm/z, ap=2mm	Vc=212m/min, fz=0.2mm/z, ap=3mm	Vc=160m/min, fz=0.2mm/z, ap=1.5mm

Application results  
Ergebnis



\* = Germany GG25 Materialvergleichstabelle in Kapitel E

# Milling · Fräsen

General Technical Information · Allgemeine Technische Informationen

## Coated Cemented Carbide **PVD** Beschichtetes Hartmetall **PVD**

Grade · Sorte	Coating · Beschicht.	ISO	Application Anwendung
<b>YBG102</b>	PVD nano-TiAlN coated fine grain hard carbide grade.	<b>K05~K20</b>	For light milling of cast iron, hard steel.
	Nano-TiAlN PVD-beschichtete, feinkörnige Hartmetallsorte.		Zum Schlichtfräsen von Guss und gehärtetem Stahl.
<b>YBG202</b>	PVD nano-TiAlN coated fine grain hard carbide grade. Good performance in combination of toughness and wear resistance.	<b>P10~30</b>	Milling of steel, finishing and semi-finishing of stainless steel, cast iron and hightemperature alloys .  Zum Fräsen von Stahl, rostfreiem Stahl, Guss und warmfesten Superlegierungen bei leichter und mittlerer Bearbeitung.
	Nano-TiAlN PVD-beschichtetes, feinkörnige Hartmetallsorte. Hervorragende Kombination von Zähigkeit und Verschleißfestigkeit.	<b>M10~30</b>	
		<b>S05~20</b>	
<b>YBG205</b>	Special PVD nano-TiAlN coated fine grain hard carbide grade. Good performance in combination of toughness and wear resistance.	<b>P10~30</b>	Milling of steel, finishing and semi-finishing of stainless steel, cast iron and hightemperature alloys .  Zum Fräsen von Stahl, rostfreiem Stahl, Guss und warmfesten Superlegierungen bei leichter und mittlere Bearbeitung
	Sonder Nano-TiAlN PVD-beschichtetes, feinkörnige Hartmetallsorte. Hervorragende Kombination von Zähigkeit und Verschleißfestigkeit.	<b>M10~30</b>	
		<b>S05~20</b>	
<b>YBG302</b>	Substrate with reasonable hardness and strength + Nano-TiAlN PVD coating	<b>M10~30</b>	For rough and semi-finish milling of steel stainless and cast iron.
	Substrate mit einer angemessenen Härte und Festigkeit + Nano-TiAlN PVD Beschichtung.	<b>S05~20</b>	Anwendung für mittlere- und Schruppbearbeitung von Stahl, rostfreiem Stahl und Guss.
<b>YBG152</b>	Substrate with medium hardness and strength + Nano-TiAlN PVD coating	<b>K 20~35</b>	Applicable for rough and semi-finish milling of steel stainless and cast iron.
	Substrate mit mittlerer Härte und Festigkeit + Nano-TiAlN PVD Beschichtung		Anwendung für Schrupp- und mittlerer Bearbeitung. von Stahl, rostfreiem Stahl und Guss.
<b>YBG252</b>	ultra fine carbide substrate plus nano-TiAlN PVD coating with high strength, toughness and wear resistance.	<b>P05~20</b>	special for finishing of alloy steel, stainless steel and cast iron.  sonder zum schlichten von legiertem Stahl, rostfreiem Stahl und Guss.
	Ultra-feinkorn-Hartmetall mit hoher Zugfestigkeit, Zähigkeit- und Verschleißfestigkeit, plus Nano-TiAlN PVD-Beschichtung.	<b>M05~20</b>	
		<b>K05~K20</b>	

**B**

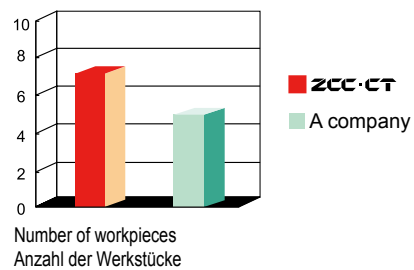
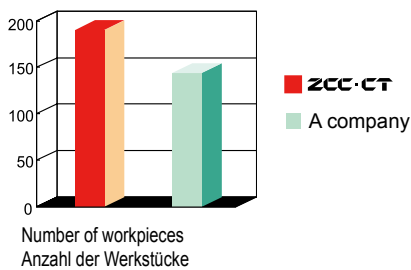
**Application  
Anwendung**

Component  
Werkstück



Machine Maschine	Machining center, dry cutting Bearbeitungscenter, trocken	Horizontal milling machine, dry cutting Horizontal Fräsmaschine, Trockenbearbeitung
Workp. material & hardness Werkstückstoff & Härte	Nodular cast iron HB 220 Guss	7CrSiMoV HRC25
Type of machining Bearbeitung	Face milling Planfräser	Profil milling Formfräsen
Milling tool Fräs Werkzeug	EMP02-050-A22-AP11-06	BMR03-050-MT5-M
Applicable insert Fräsplatte	YBG102/APKT11T308-PM	YBG302/XPHT50R2507- GM
Cutting data Schnittdaten	Vc=235m/min, fz=0.15mm/z, ap=1~3mm	Vc=120m/min, fz=0.25mm/z, ap=8mm

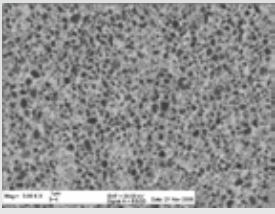

Application results  
Ergebnis



# Milling - Fräsen

General Technical Information · Allgemeine Technische Informationen

Cermet

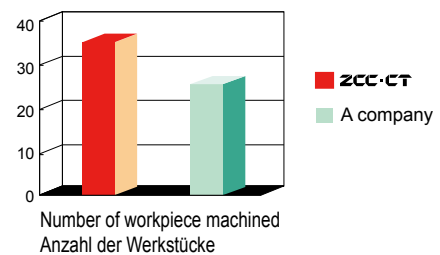
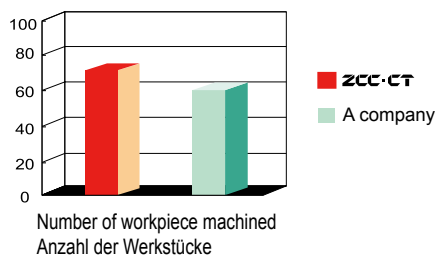
Grade · Sorte	Micro-Structure	ISO	Application Anwendung
<b>YNG151</b>		<b>P05~20</b>	Applicable for finishing P, M & K ISO Code  Anwendung für die Schlichtbearbeitung P,M und K ISO Anwendungsbereich
		<b>M05~20</b>	
		<b>K05~20</b>	
<b>YNG151C</b>		<b>P01~20</b>	Applicable for finish milling P, M and K ISO Code  Anwendung für die Schlichtbearbeitung P,M und K ISO Anwendungsbereich
		<b>M01~20</b>	
		<b>K01~20</b>	

## Application Anwendung



Machine Maschine	Machining center, dry cutting Bearbeitungscenter, Trockenbearbeitung	Machining center, dry cutting Bearbeitungscenter, Trockenbearbeitung
Workp. material & hardness Werkstückstoff & Härte	45 steel HB 170~220 Stahl	NAK80* HRC42~48
Type of machining Bearbeitung	Face milling finishing Schlichtfräsen	Face milling finishing Schlichtfräsen
Milling tool Fräswerkzeug	FMA03-160-B40-SE12-08	FME03-160-B40-SP12-10
Applicable insert Fräsplatte	YNG151/SEEN1203AFTN	YNG151C/SPEN1203EDER
Cutting data Schnittdaten	Vc=400m/min, fz=0.1mm/z, ap=0.3mm	Vc=420m/min, fz=0.12mm/z, ap=0.35mm

### Application results Ergebnis



# Milling · Fräsen

General Technical Information · Allgemeine Technische Informationen

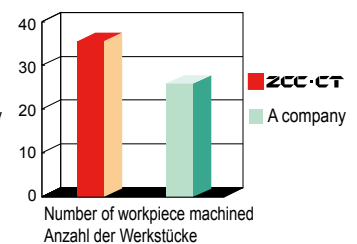
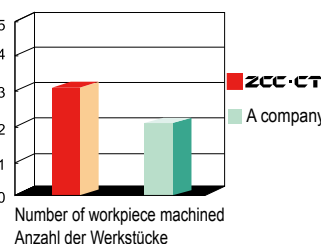
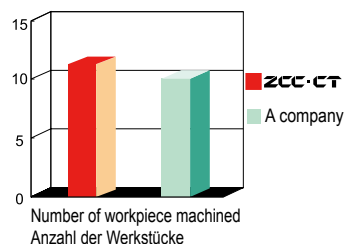
## Cemented Carbide

Grade · Sorte	Micro-Structure	ISO	Application Anwendung
<b>YC30S</b>		<b>P25-40</b>	Applicable for roughing ISO Code P, M Anwendung für die Schruppbearbeitung ISO Anwendungsbereich P & M.
		<b>M25-40</b>	
<b>YD051</b>		<b>K05-20</b>	Applicable for milling/ finishing type ISO Code K Anwendung für die Schlichtbearbeitung ISO Anwendungsbereich K.
<b>YD101</b>		<b>N05-25</b>	Applicable for semi-finish and finish milling type ISO Code N. Anwendung für die Mittlere bis Feinbearbeitung ISO Anwendungsbereich N.
<b>YD201</b>		<b>K15-35</b>	Applicable for rough and semi-finish ISO Code K, and for rough milling ISO Code N.
		<b>N15-30</b>	Anwendung für die schrupp - mittlerer Bearbeitung ISO Anwend. K und für die Schruppbearbeitung N ISO Anwendung.

### Application Anwendung

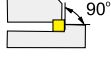
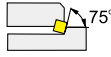


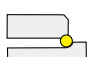
Component Werkstück			
Machine Maschine	Verti. machining center, wet machining Vertikales Bearbeitungscenter, Kühlmittel	Face milling machine, wet machining Planfräsmaschine, Kühlmittel	Face milling machine, dry cutting Planfräsmaschine, Trockenbearbeitung
Workp. material & hardn. Werkstückstoff & Härte	Aluminum alloy HB100	40CrMnMo HB240	HT250 HB220
Type of machining Bearbeitung	Face milling Planfräser	Face milling Planfräser	Face milling Planfräser
Milling tool Fräswerkzeug	FMA01-100-B32-SE12-07	FMP01-100-B32-TP22-06	FME03-160-B40-SP15-10
Applicable insert Fräsplatte	YD101/SEET12T3-LH	YC30S/TPKN2204PDR	YD201/SPKN1504EDTR
Cutting data Schnittdaten	Vc=300-350m/min, a <sub>p</sub> =1-2mm, fz=0.2mm/z	Vc=170m/min, a <sub>p</sub> =5-7mm, fz=0.3mm/z	Vc=100-130m/min, a <sub>p</sub> =7mm, fz=0.35mm/z

### Application results Ergebnis



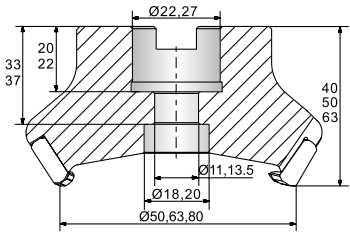
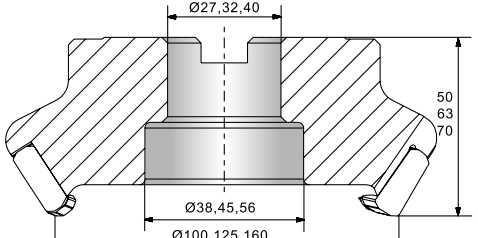
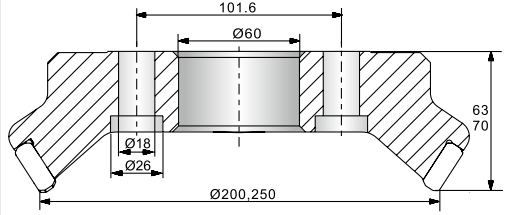
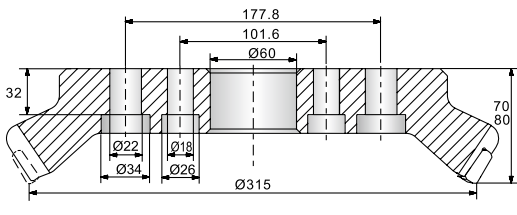
## Indexable milling tools code key · Kennzeichnung Fräsen ISO Code

Cutter style / Fräser Typ	
<b>FM</b>	Face milling tools Planfräser
<b>EM</b>	Shoulder face milling tools Eck-und Nutenfräser
<b>HM</b>	Helix end milling tools Walzenstirnfräser
<b>SM</b>	Side and face milling tools Scheibenfräser
<b>BM</b>	Profile milling tools Kopierfräser
<b>CM</b>	Chamfering end milling tools Fasfräser
<b>XM</b>	Special milling tools Sonderfräser
<b>TM</b>	

Lead angle Einstellwinkel der Platten		
<b>P</b>	90°	
<b>E</b>	75°	
<b>D</b>	60°	
<b>A</b>	45°	
<b>R</b>		

Serial number Serien Nr.
Tool diameter Werkzeug Durchmesser Side and face milling tool : diameter x cutting edge width Plan- und Eckfräser: Durchmesser x WSP-Breite
Coupling size (mm) (as follow figure) Aufnahmetyp









**FM E 03 100 - B 32**

Structure shape and size of positioning Ausführung und Größe von Werkzeugaufnahme			
<b>A</b>		<b>B</b>	
	Arbor Ø50-Ø80		Arbor Ø100-Ø160
<b>C</b>		<b>D</b>	
	Arbor Ø200-Ø250		Arbor Ø315
<b>G</b>	Cylindrical Shank / Zylinderschaft	<b>MW</b>	MW
<b>XP</b>	Weldon		

Regarding to the Weldon shank, straight shank and Morse taper shank etc coupling method, please refer to the technical data of tooling systems



Cutting edge length of insert  
Schneidenlänge

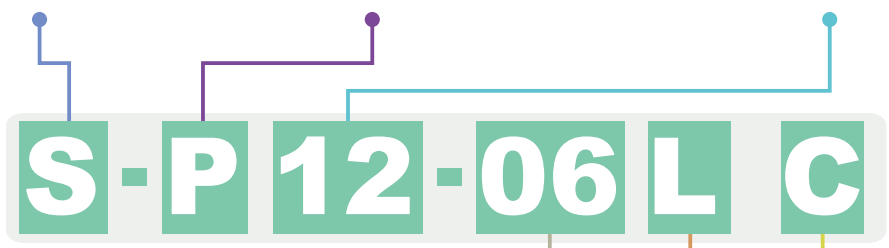
 80° <b>C</b>	 55° <b>D</b>
 <b>R</b>	 <b>S</b>
 60° <b>T</b>	 <b>L</b>
 <b>H</b>	 <b>O</b>

Insert clearance angle  
Freiwinkel der Platten

<b>N</b>	0°
<b>B</b>	5°
<b>C</b>	7°
<b>P</b>	11°
<b>D</b>	15°
<b>E</b>	20°
<b>F</b>	25°

Cutting edge length of insert  
Schneidenlänge

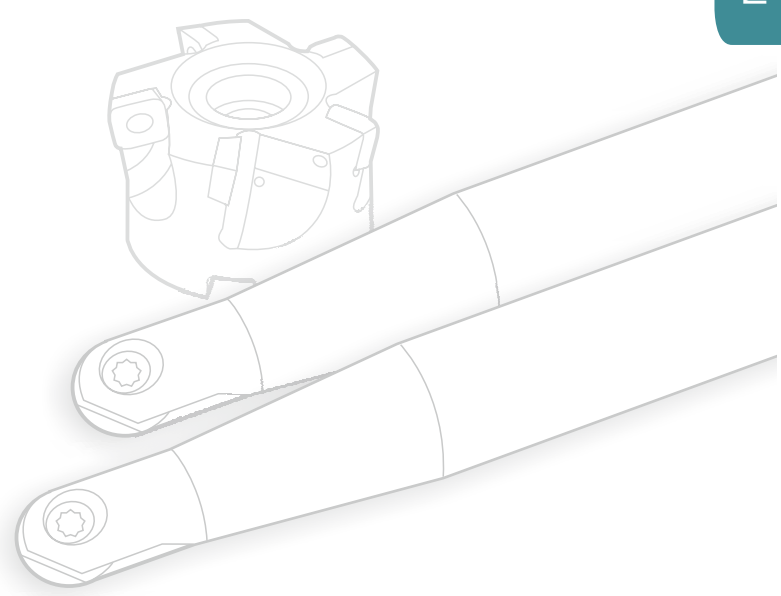
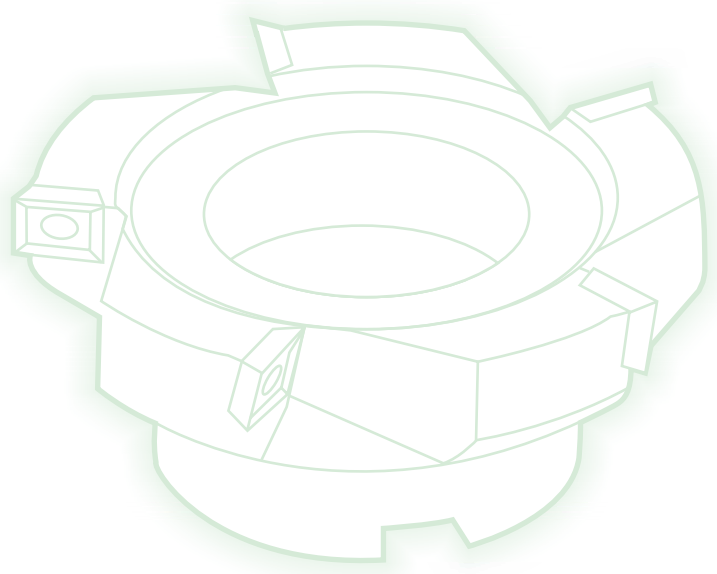
Diameter Durchmesser	Insert Shape / Plattenform					
	<b>C</b>	<b>D</b>	<b>R</b>	<b>S</b>	<b>T</b>	<b>L</b>
5.556	—	—	—	—	09	—
6.350	06	07	—	—	11	—
9.525	09	11	09	09	16	—
12.700	12	15	12	12	22	—
15.875	16	19	15	15	27	—
19.050	19	—	19	19	33	—
25.400	25	—	25	25	44	25



Number of teeth  
Anzahl Zähne

Cutting direction / Schnittrichtung  
R= right/rechts L=left/ links

With Internal cooling  
Mit Innenkühlung



# Milling · Fräsen

Indexable Milling Tools · Wendeplattenfräser

## Face Milling Tools · Planfräser

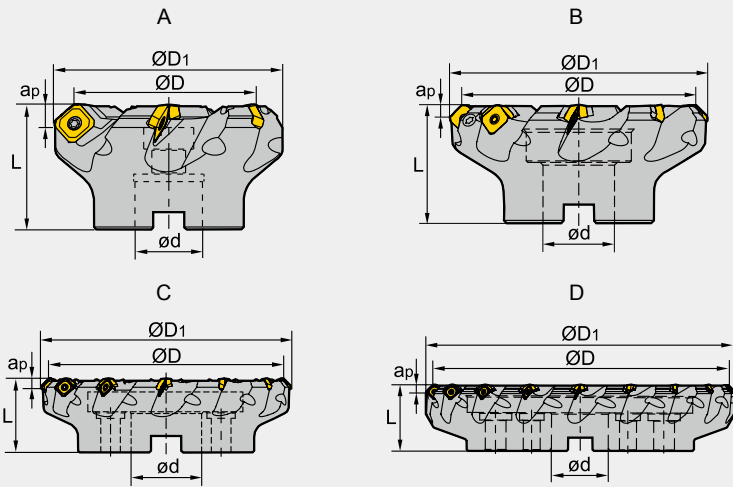
Kr:45°



**FMA01** P M K N S



Close pitch (D)  
Enge Teilung (D)



### Specification of tools · Werkzeug Beschreibung

Type · Typ	Stock Lager		Dimension (mm) Abmessung					No. of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)
	R	L	Ø D	Ø D <sub>1</sub>	Ø D	L	a <sub>pmax</sub>			
<b>FMA01</b> -050-A22-SE12-04	●	○	50	61	22	40	6	4	A	0.3
-050-A22-SE12-04C	○	○	50	61	22	40	6	4	A	0.3
-063-A22-SE12-05	●	○	63	74	22	40	6	5	A	0.5
-063-A22-SE12-05C	○	○	63	74	22	40	6	5	A	0.5
-080-A27-SE12-06	●	○	80	91	27	50	6	6	A	1.2
-080-A27-SE12-06C	○	○	80	91	27	50	6	6	A	1.2
-100-B32-SE12-07	●	○	100	107	32	50	6	7	B	1.2
-100-B32-SE12-07C	○	○	100	107	32	50	6	7	B	1.2
-125-B40-SE12-08	●	○	125	136	40	63	6	8	B	2.6
-125-B40-SE12-08C	○	○	125	136	40	63	6	8	B	2.6
-160-B40-SE12-10	●	○	160	170	40	63	6	10	B	4.3
-200-C60-SE12-12	●	○	200	210	60	63	6	12	C	7.6
-250-C60-SE12-14	●	○	250	260	60	63	6	14	C	13.5
-315-D60-SE12-18	●	○	315	325	60	70	6	18	D	20.8

### Spare Parts · Ersatzteile

Diameter Durchmesser Ø D	Screw Schraube	Shim Unterlage	Shim screw Unterlagenschraube	Wrench Schlüssel	Wrench Schlüssel
Ø50-Ø100	I60M3.5×10	--	--	WT15IS	--
Ø125-Ø315	I60M3.5×12	S13BS	SM5×7XA	WT15IS	WH35L

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

### Face Milling Tools · Planfräser

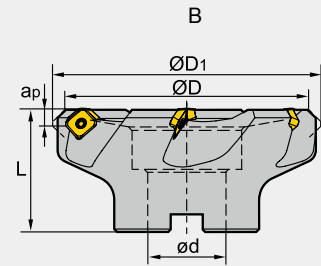
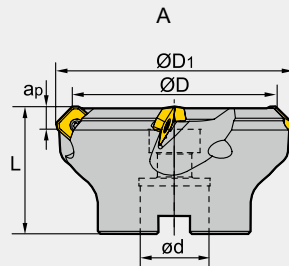
Kr:45°



**FMA02** P M K N S



Coarse and differential pitch  
normale und weite Teilung



### ■ Specification of tools · Werkzeug Beschreibung

Type · Typ	Stock Lager		Dimension (mm) Abmessung					No. of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)
	R	L	Ø D	Ø D <sub>1</sub>	Ø D	L	ap <sub>max</sub>			
<b>FMA02</b> -050-A22-SE12-03	●	○	50	61	22	40	6	3	A	0.4
-063-A22-SE12-04	●	○	63	74	22	40	6	4	A	0.6
-080-A27-SE12-04	●	○	80	91	27	50	6	4	A	1.3
-100-B32-SE12-05	●	○	100	107	32	50	6	5	B	1.3
-125-B40-SE12-06	●	○	125	131	40	63	6	6	B	2.6

### ■ Spare Parts · Ersatzteile

Diameter Durchmesser Ø D	Screw Schraube	Wrench Schlüssel	
Ø50-Ø125	I60M3.5×10	WT15IS	

Applicable tool **B9-B15**  
Werkzeug

Tools code key **B24-B25**  
Werkzeug ISO

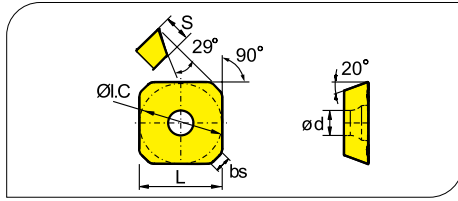
Grade selection guide **B17-23**  
Sortenauswahl

Technical data **B182-B188**  
Technische Daten

# Milling · Fräsen

## Indexable Milling · Fräswendeplatten

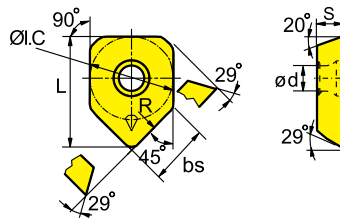
Applicable inserts · Wendeschneidplatten



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

Workpiece Material / Werkstoffe	P	M	K	N	S
Steel / Stahl	●	●	●	●	●
Stainless Steel / Rostfreier Stahl	●	●	●	●	●
Cast iron / Gusseisen	●	●	●	●	●
Non-ferrite material / Ne Metalle	●	●	●	●	●
Heat-resistant steel / Warmfester Stahl	●	●	●	●	●

Insert shape Plattenform	Type · Typ	Dimension (mm) Abmessung						CVD Coating CVD Beschicht.					PVD Coating PVD Beschicht.					Cermet		Carbide uncoat. unbe. Hartmetall						
		L	I.C	S	d	bs	R	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201	
	SEET12T3-DF	13.4	13.4	3.97	4.1	2.55		●	●	●				●												
	SEET12T3-CF	13.4	13.4	3.97	4.1	2.55								●												
	SEET12T3-EF	13.4	13.4	3.97	4.1	2.55									○		●									
	SEET12T3-DM	13.4	13.4	3.97	4.1	2.55		●	●	●	●															
	SEET12T3-CM	13.4	13.4	3.97	4.1	2.55								●												
	SEET12T3-EM	13.4	13.4	3.97	4.1	2.55				●							●									
	SEET12T3-DR	13.4	13.4	3.97	4.1	2.55		●	●		●			○		○										
	SEET12T3-CR	13.4	13.4	3.97	4.1	2.55											●	○								
	SEET12T3-LH	13.4	13.4	3.97	4.1	2.55																		●	●	
	SEET12T3-W	17.82	13.4	3.97	4.1	9.46	500		○		●			●		○										○



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

### Chipbreaker Selection for FMA01/02 · Spanbrecher Auswahl für FMA01/02

Application Anwendung		Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	Roughing Schruppen
<b>P</b>		-DF	-DM	-DR
<b>M</b>	<b>S</b>	-EF	-EM	
<b>K</b>		-CF	-CM	-CR
<b>N</b>		-LH		

### Recommended cutting data · Empfohlene Schnittdaten

Workpiece material Werkstückstoff	Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten				
			V (m/min)	f (mm/z)			
				-DF	-DM	-DR	
<b>P</b>	Low-carbon steel Soft steel Niedrig legierter Kohlenstoffstahl Baustahl	YBM251 YBC301	270(220-350)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)	
		YBG202 YBG205	270(200-360)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)	
		YBG302	230(170-350)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)	
	High-carbon steel Alloy steel Hoch Leg. Kohlenstoffstahl	YBM251 YBC301	240 (200-320)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)	
		YBG202 YBG205	240 (180-350)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)	
		YBG302	220 (150-330)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)	
	Alloy tool steel Leg. Werkzeugstahl	YBM251 YBC301	220 (180-300)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)	
		YBG202 YBG205	220 (170-340)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)	
		YBG302	190 (130-300)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)	
<b>M</b>	Stainless steel Rostfreier Stahl			-EF	-EM		
		YBM251	150 (120-240)	0.15(0.1-0.2)	0.2 (0.1-0.3)		
		YBG202 YBG205	160 (110-270)	0.15(0.1-0.2)	0.2 (0.1-0.3)		
		YBG302	140 (100-250)	0.15(0.1-0.2)	0.2 (0.1-0.3)		
<b>K</b>	Cast iron Gusseisen	YBG102	210 (120-300)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)	
		YBD152	240 (180-300)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)	
<b>N</b>	Al alloy NE-Metalle	YD101	300-	-LH 0.25 (0.1-0.4)			
		YD201	300-				
<b>S</b>	High temperature alloy Hoch warmfeste Leg.			-EF	-EM		
		YBG102	50(20-60)	0.1 (0.1-0.2)	0.15 (0.1-0.3)		
		YBG202 YBG205	40(20-50)	0.1 (0.1-0.2)	0.15 (0.1-0.3)		

# Milling · Fräsen

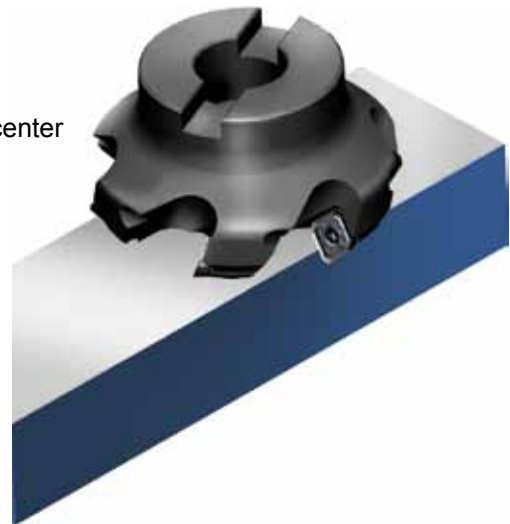
Indexable Milling Tools · Wendeplattenfräser

Case study for FMA 01  
 Bearbeitungsbeispiel für FMA 01

Workpiece material  
 Werkstückstoff: 1Cr18Ni9Ti (HB180)  
 Cooling system  
 Kühlsystem: dry cutting, trocken

Machine  
 Maschine: vertical  
 machining center  
 vertikales Mascinencenter

Cutting data  
 Schnittdaten:  
 $V_c=160\text{m/min}$   
 $a_p=1\text{mm}$   
 $f_z=0.2\text{mm/z}$   
 $a_e=60\text{mm}$



- Tool · Werkzeug: FMR01-080-A27-SE12-06
- Inserts · WSP: SEET12T3-DM/YBG202

Surface roughness of workpiece  
 Rauhtiefe des Material

**ZCC-CT: Ra1.2**

Other company product: Ra1.6

- Wear comparison of insert.
- Verschleißvergleich der WSP

**ZCC-CT**

Other company product

17'30"



29'30"



33'30"

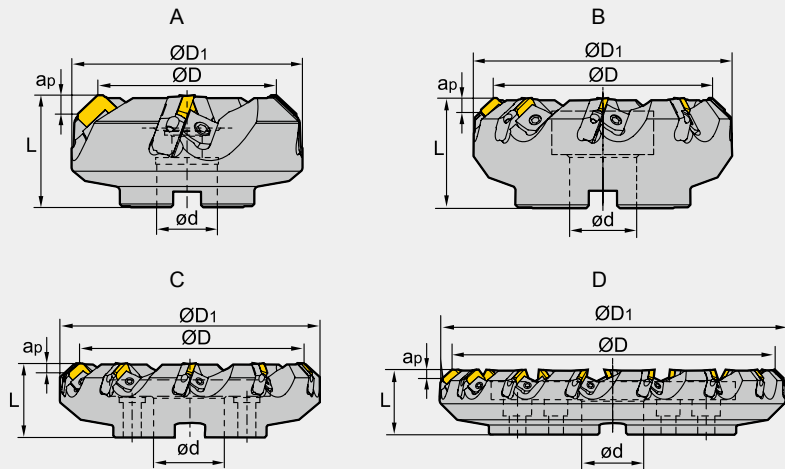


### Face Milling Tools · Planfräser

Kr:45°



**FMA03** P M K



### Specification of tools · Werkzeug Beschreibung

Type · Typ	Stock Lager	Dimension (mm) Abmessung						No. of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)	
		R	L	Ø D	Ø D <sub>1</sub>	Ø D	L				ap <sub>max</sub>
<b>FMA03</b> -080-A27-SE12-04	○ ○			80	103	27	50	5.5	4	A	1.8
-100-B32-SE12-05	○ ○			100	122	32	50	5.5	5	B	2.4
-125-B40-SE12-06	○ ○			125	147	40	63	5.5	6	B	4.4
-160-B40-SE12-08	○ ○			160	181	40	63	5.5	8	B	6.4
-200-C60-SE12-10	○ ○			200	221	60	63	5.5	10	C	8.5
-250-C60-SE12-12	○ ○			250	270	60	63	5.5	12	C	14.1
-315-D60-SE12-15	○ ○			315	353	60	63	5.5	15	D	22.2
-080-A27-SE15-04	○ ○			80	103	27	50	7.5	4	A	1.7
-100-B32-SE15-05	○ ○			100	122	32	50	7.5	5	B	2.3
-125-B40-SE15-06	○ ○			125	147	40	63	7.5	6	B	4.2
-160-B40-SE15-08	○ ○			160	181	40	63	7.5	8	B	6.1
-200-C60-SE15-10	○ ○			200	221	60	63	7.5	10	C	8.3
-250-C60-SE15-12	○ ○			250	270	60	63	7.5	12	C	13.6
-315-D60-SE15-15	○ ○			315	353	60	63	7.5	15	D	21.8

### Parts · Ersatzteile

Diameter Durchmesser Ø D	Insert Platte	Cassette Kassette	Wedge Keil	Wedge screw Keilschraube	Locator screw Schraube	Wrench Schlüssel
Ø80-Ø315	SE12	LSE12R/L	W01R/L	DM8×21X	LOM5×15.1	WT20T WH40T
Ø80-Ø315	SE15	LSE15R/L				

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

Applicable tool B9-B15  
Werkzeug

Tools code key B24-B25  
Werkzeug ISO

Grade selection guide B17-23  
Sortenauswahl

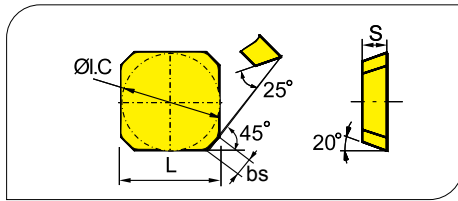
Technical data B182-B188  
Technische Daten

# Milling · Fräsen

## Indexable Milling · Fräswendeplatten

■ Applicable inserts · Wendeschneidplatten

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



Workpiece Material / Werkstoffe	P	M	K	N	S
Steel / Stahl	●	●	●	●	●
Stainless Steel / Rostfreier Stahl	●	●	●	●	●
Cast iron / Gusseisen			●	●	●
Non-ferrite material / Ne Metalle				●	●
Heat-resistant steel / Warmfester Stahl				●	●

Insert shape Plattenform	Type · Typ	Dimension (mm) Abmessung				CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.				Cermet	Carbide uncoat. unbe. Hartmetall							
		L	I.C	S	bs	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302		YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SEEN1203AFTN	12.7	12.7	3.18	1.8																			
	SEKN1203AFFN	12.7	12.7	3.18	1.8																			
	SEKN1203AFN	12.7	12.7	3.18	1.8	●															○		●	
	SEKN1203AFTN	12.7	12.7	3.18	1.8	●		●										●			●			●
	SEKR1203AFN	12.7	12.7	3.18	1.8	●	○					●												
	SEKN1504AFN	15.875	15.875	4.76	1.6	○																	○	○
	SEKN1504AFTN	15.875	15.875	4.76	1.6	●	●	●													●			
	SEKR1504AFN	15.875	15.875	4.76	1.6																			

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



### Recommended cutting data · Empfohlene Schnittdaten

	Workpiece material Werkstückstoff	Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten	
				V (m/min)	f (mm/z)
<b>P</b>	Low-carbon steel Soft steel Niedrig legierter Kohlenstoffstahl Baustahl	≤180	YNG151	430 (340-500)	0.2 (0.1-0.4)
			YBM251 YBC301	270 (220-350)	0.2 (0.1-0.4)
			YBM351	220 (180-300)	0.25 (0.15-0.3)
			YBG202 YBG205	270 (200-360)	0.2 (0.1-0.3)
			YC30S	140 (100-220)	0.27 (0.1-0.4)
	High-carbon steel Alloy steel Hoch Leg. Kohlenstoffstahl	180-280	YNG151	400 (320-480)	0.2 (0.1-0.4)
			YBM251 YBC301	240 (200-320)	0.2 (0.1-0.4)
			YBM351	200 (160-280)	0.25 (0.15-0.3)
			YBG202 YBG205	240 (180-350)	0.2 (0.1-0.3)
			YC30S	120 (80-200)	0.27 (0.1-0.4)
	Alloy tool steel Leg. Werkzeugstahl	280-350	YNG151	350 (300-450)	0.2 (0.1-0.4)
			YBM251 YBC301	220 (180-300)	0.2 (0.1-0.4)
			YBM351	180 (150-250)	0.25 (0.15-0.3)
			YBG202 YBG205	220 (170-340)	0.2 (0.1-0.3)
			YC30S	100 (60-180)	0.27 (0.1-0.4)
<b>M</b>	Stainless steel Rostfreier Stahl	≤270	YNG151	220 (160-280)	0.2 (0.1-0.4)
			YBM251	130 (100-220)	0.2 (0.1-0.4)
			YBM351	140 (100-240)	0.25 (0.15-0.3)
			YBG202 YBG205	140 (100-250)	0.2 (0.1-0.3)
<b>K</b>	Cast iron Gusseisen	180-250	YBG102	210 (120-300)	0.2 (0.1-0.3)
			YBD252	200 (150-250)	0.2 (0.1-0.4)
			YD201	100 (80-160)	0.25 (0.1-0.4)

# Milling · Fräsen

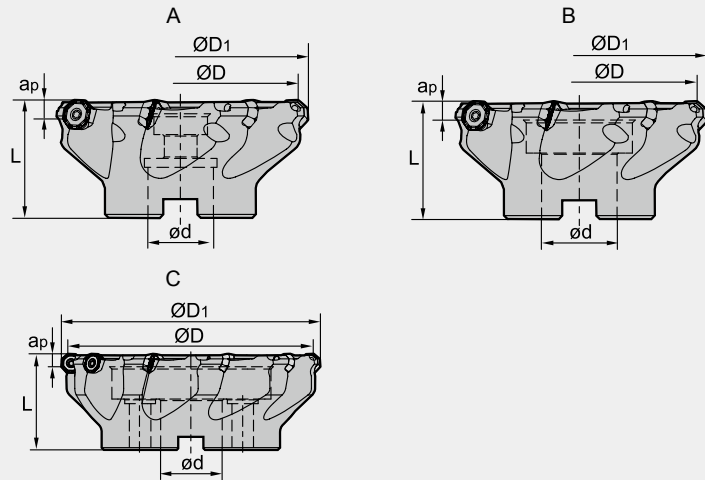
Indexable Milling Tools · Wendeplattenfräser

## Face Milling Tools · Planfräser

Kr:45°



**FMA04** P M K N




### Specification of tools · Werkzeug Beschreibung

Type · Typ	Stock Lager		Dimension (mm) Abmessung					No. of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)
	R	L	Ø D	Ø D <sub>1</sub>	Ø D	L	ap <sub>max</sub>			
<b>FMA04</b> -050-A22-OF05-04	●	○	50	56	22	40	3.5	4	A	0.3
-050-A22-OF05-05	○	○	50	56	22	40	3.5	5	A	0.4
-050-A22-OF05-05C	○	○	50	56	22	40	3.5	5	A	0.4
-063-A22-OF05-05	●	○	63	69	22	40	3.5	5	A	0.5
-063-A22-OF05-05C	○	○	63	69	22	40	3.5	5	A	0.5
-080-A27-OF05-06	●	○	80	86	27	50	3.5	6	A	0.8
-080-A27-OF05-06C	○	○	80	86	27	50	3.5	6	A	0.8
-100-B32-OF05-07	●	○	100	106	32	50	3.5	7	B	1.2
-100-B32-OF05-07C	○	○	100	106	32	50	3.5	7	B	1.2
-125-B40-OF05-08	●	○	125	130	40	63	3.5	8	B	2.7
-125-B40-OF05-08C	○	○	125	130	40	63	3.5	8	B	2.7
-160-B40-OF05-10	●	○	160	165	40	63	3.5	10	B	5.1
-160-C40-OF05-10			160	165	40	63	3.5	10	C	4.1

### Parts · Ersatzteile

Diameter Durchmesser Ø D	Screw Schraube	Wrench Schlüssel
Ø50- Ø63	I60M4×8.4	WT15IS
Ø80- Ø160	I60M4×10	

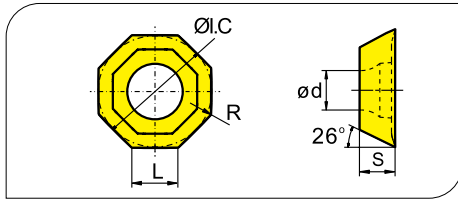


● Ex Stock / ab Lager ○ On demand / auf Anfrage

# Milling · Fräsen

## Indexable Milling Tools · Wendepplattenfräser

### Applicable inserts · Wendeschneidplatten



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

Workpiece Material / Werkstoffe	Machining Conditions														
	P	M	K	N	S	1	2	3	4	5	6	7	8	9	10
<b>P</b> Steel / Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
<b>M</b> Stainless Steel / Rostfreier Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
<b>K</b> Cast iron / Gusseisen										●	●	●	●	●	●
<b>N</b> Non-ferrite material / Ne Metalle															●
<b>S</b> Heat-resistant steel / Warmfester Stahl										●	●	●	●	●	●

Insert shape Plattenform	Type · Typ	Dimension (mm) Abmessung					CVD Coating CVD Beschicht.					PVD Coating PVD Beschicht.					Cermet		Carbide uncoat. unbe. Hartmetall						
		L	I.C	S	d	R	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201	
	<b>OFKT05T3-DF</b>	5.26	12.7	3.97	4.4	0.5		○	○				●	●	●										
	<b>OFKT05T3-DM</b>	5.26	12.7	3.97	4.4	0.5							●	●	●										
	<b>OFKT05T3-LH</b>	5.26	12.7	3.97	4.4	0.5																		●	

### Chipbreaker Selektion FMA04 · Spanbrecher Auswahl FMA04

Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung
<b>P</b>		
<b>M</b>	-DF	-DM
<b>K</b>		
<b>AL</b>	-LH	

Applicable tool **B9-B15**  
Werkzeug

Tools code key **B24-B25**  
Werkzeug ISO

Grade selection guide **B17-23**  
Sortenauswahl

Technical data **B182-B188**  
Technische Daten

# Milling · Fräsen

Face Milling Tools · Planfräsen

## Recommended cutting data · Empfohlene Schnittdaten

Workpiece material Werkstückstoff	Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten			
			V (m/min)	f (mm/z)		
				-DF	-DM	
<b>P</b> Low-carbon steel Soft steel Niedrig legierter Kohlenstoffstahl Baustahl	≤180	YBM251	270 (220-350)	0.2 (0.1-0.3)	0.25 (0.1-0.4)	
		YBG202 YBG205	270 (200-360)	0.2 (0.1-0.3)	0.25 (0.1-0.4)	
		YBM351	220 (180-300)	0.2 (0.1-0.3)	0.25 (0.1-0.4)	
		YBG302	230 (170-350)	0.2 (0.1-0.3)	0.25 (0.1-0.4)	
	High-carbon steel Alloy steel Hoch Leg. Kohlenstoffstahl	180-280	YBM251	240 (200-320)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
			YBG202 YBG205	240 (180-350)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
			YBM351	200 (160-280)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
			YBG302	220 (150-330)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
	Alloy tool steel Leg. Werkzeugstahl	280-350	YBM251	220 (180-300)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
			YBG202 YBG205	220 (170-340)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
			YBM351	180 (150-250)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
			YBG302	190 (130-300)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
<b>M</b> Stainless steel Rostfreier Stahl	≤270	YBG202 YBG205	160 (110-270)	0.15 (0.1-0.3)	0.2 (0.1-0.4)	
		YBG302	140 (100-250)	0.15 (0.1-0.3)	0.2 (0.1-0.4)	
		YBM251	150 (120-250)	0.15 (0.1-0.3)	0.2 (0.1-0.4)	
<b>K</b> Cast iron Gusseisen	180-250	YBG102	210 (120-300)	0.2 (0.1-0.3)	0.25 (0.1-0.4)	
				-LH		
<b>N</b> Al alloy leg. Alu	-	YD101	300-	0.15 (0.05-0.3)		

**B**

Milling Tools · Fräser

### Case study for FMA04 Bearbeitungsbeispiel für FMA04

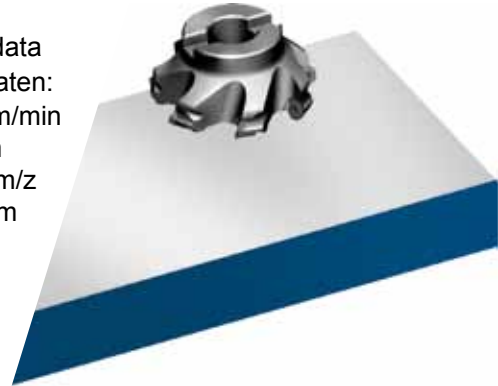


- Tool · Werkzeug: FMA04-100-B32-OF05-07
- Inserts · WSP: OFKT05T3-DM/YBG202

Workpiece material  
Werkstückstoff: 42CrMo (HB200)  
Cooling system  
Kühlsystem: dry cutting, trocken

Machine: vertical machining center  
Maschine: vertikales Maschinencenter

Cutting data  
Schnittdaten:  
Vc=180m/min  
ap=1mm  
fz=0.2mm/z  
ae=60mm

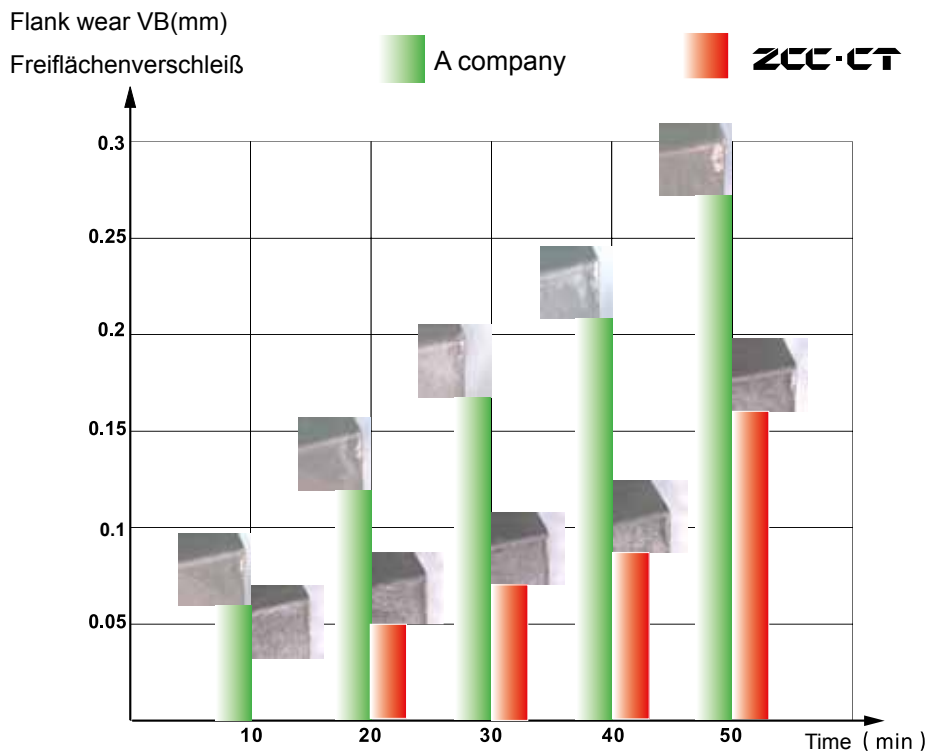


Surface roughness  
Rauhtiefe

**ZCC-CT: Ra1.2**

Other company product Ra1.6

- Wear comparison of insert
- Verschleißvergleich der WSP



# Milling · Fräsen

Indexable Milling Tools · Wendepplattenfräser

## Face Milling Tools · Planfräser

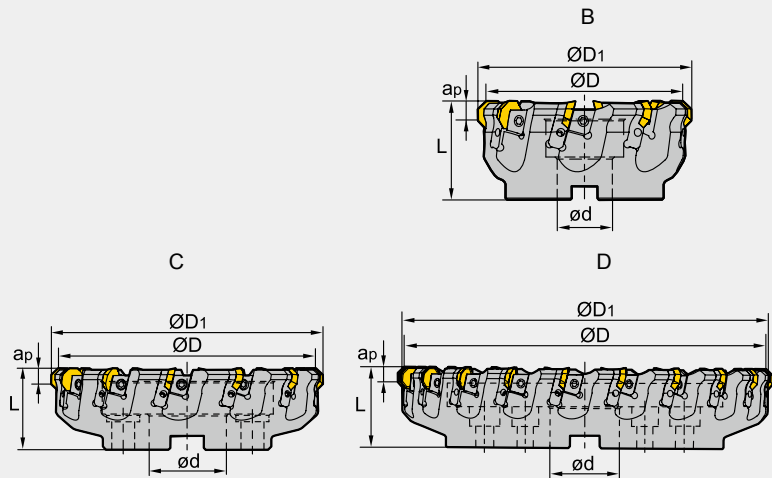
Kr:45°



**FMA04** P M K



Wedge Keil



### Specification of tools · Werkzeug Beschreibung

Type · Typ	Stock Lager	Dimension (mm) Abmessung							No. of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)
		R	L	Ø D	Ø D <sub>1</sub>	Ø D	L	ap <sub>max</sub>			
<b>FMA04</b>	-125-B40-OF07-08	●	○	125	136	40	63	5	8	B	3.9
	-160-B40-OF07-10	●	○	160	171	40	63	5	10	B	5.9
	-200-C60-OF07-12	●	○	200	211	60	63	5	12	C	7.6
	-250-C60-OF07-16	●	○	250	261	60	63	5	16	C	13.3
	-315-D60-OF07-20	●	○	315	321	60	63	5	20	D	20.3

### Parts · Ersatzteile

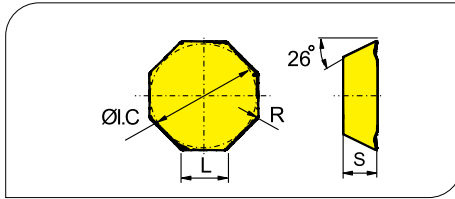
Diameter Durchmesser Ø D	Cassette Kassette	Wedge Keil	Wedge screw Keilschraube	Locator screw Einstellschraube	Wrench Schlüssel	
Ø125-Ø315	LOF07R/L	W02R/L	DM8×21X	LOM5×15.1	WT20T WH40T	

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

# Milling · Fräsen

## Indexable Milling Tools · Wendepplattenfräser

### Applicable inserts · Wendeschneidplatten



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

Workpiece Material / Werkstoffe	P	M	K	N	S
Steel / Stahl	●	●	●	●	●
Stainless Steel / Rostfreier Stahl	●	●	●	●	●
Cast iron / Gusseisen	●	●	●	●	●
Non-ferrous material / Ne Metalle	●	●	●	●	●
Heat-resistant steel / Warmfester Stahl	●	●	●	●	●

Insert shape Plattenform	Type · Typ	Dimension (mm) Abmessung				CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.				Cermets		Carbide uncoat. unbe. Hartmetall						
		L	I.C.	S	R	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201	
	OFKR0704-DF	7.45	17.94	4.76	0.8			●					●											
	OFKR0704-DM	7.45	17.94	4.76	0.8	●	●	●	●	●	●	●	●	○										
	OFKR0704W-DM	7.45	17.94	4.76		●					●		○	●										

### Chipbreaker Selection FMA04 · Spanbrecher Auswahl FMA04

Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung
<b>P</b>		
<b>M</b>	-DF	-DM
<b>K</b>		

Applicable tool **B9-B15**  
Werkzeug

Tools code key **B24-B25**  
Werkzeug ISO

Grade selection guide **B17-23**  
Sortenauswahl

Technical data **B182-B188**  
Technische Daten

# Milling · Fräsen

Indexable Milling Tools · Wendeplattenfräser

## Recommended cutting data · Empfohlene Schnittdaten

Workpiece material Werkstückstoff	Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten			
			V (m/min)	f (mm/z)		
				-DF	-DM	
<b>P</b> Low-carbon steel Soft steel Niedrig legierter Kohlenstoffstahl Baustahl	≤180	YBM251	270 (220-350)	0.2 (0.1-0.3)	0.25 (0.1-0.4)	
		YBC301				
		YBG202	270 (200-360)	0.2 (0.1-0.3)	0.25 (0.1-0.4)	
		YBG205				
	YBM351	220 (180-300)	0.2 (0.1-0.3)	0.25 (0.1-0.4)		
	YBG302	230 (170-350)	0.2 (0.1-0.3)	0.25 (0.1-0.4)		
	High-carbon steel Alloy steel Hoch Leg. Kohlenstoffstahl	180-280	YBM251	240 (200-320)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
			YBC301			
			YBG202	240 (180-350)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
			YBG205			
	YBM351	200 (160-280)	0.2 (0.1-0.3)	0.25 (0.1-0.4)		
	YBG302	220 (150-330)	0.2 (0.1-0.3)	0.25 (0.1-0.4)		
Alloy tool steel Leg. Werkzeugstahl	280-350	YBM251	220 (180-300)	0.15 (0.1-0.3)	0.2 (0.1-0.4)	
		YBC301	220 (170-340)	0.15 (0.1-0.3)	0.2 (0.1-0.4)	
		YBG202				
		YBG205	180 (150-250)	0.2 (0.1-0.3)	0.25 (0.1-0.4)	
YBM351	180 (150-250)	0.2 (0.1-0.3)	0.25 (0.1-0.4)			
YBG302	190 (130-300)	0.2 (0.1-0.3)	0.25 (0.1-0.4)			
<b>M</b> Stainless steel Rostfreier Stahl	≤270	YBG202	160 (110-270)	0.15 (0.1-0.3)	0.2 (0.1-0.4)	
		YBG205				
		YBG302	140 (100-250)	0.15 (0.1-0.3)	0.2 (0.1-0.4)	
YBM251	150 (120-250)	0.15 (0.1-0.3)	0.2 (0.1-0.4)			
<b>K</b> Cast iron Gusseisen	180-250	YBG102	210 (120-300)	0.2 (0.1-0.3)	0.25 (0.1-0.4)	
		YBD252	200 (150-250)	0.2 (0.1-0.3)	0.25 (0.1-0.4)	

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

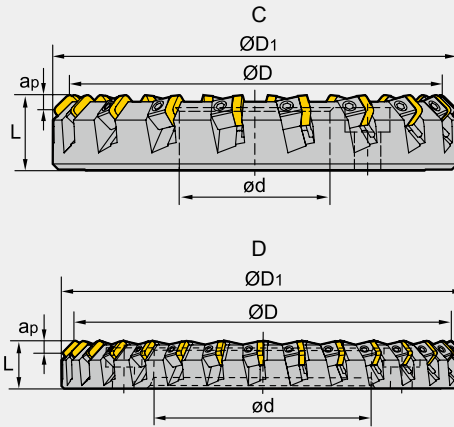


### Face Milling Tools · Planfräser

Kr:45°



**FMA05** P K



### Specification of tools · Werkzeug Beschreibung

Type · Typ	Stock Lager		Dimension (mm) Abmessung					No. of teeth Zähne	Adapter	Weight Gewicht (kg)	
	R	L	Ø D	Ø D <sub>1</sub>	Ø D	L	apmax				
<b>FMA05</b>	-200-C60-SN12-18	○	○	200	215	80	40	5	18	Adapter1	6.9
	-250-C60-SN12-24	○	○	250	265	120	40	5	24	Adapter2	9.4
	-315-D60-SN12-30	○	○	315	330	180	40	5	30	Adapter3	12.5
	-355-D60-SN12-34	○	○	355	370	220	40	5	34	Adapter4	15.1
	-400-D60-SN12-38	○	○	400	415	250	40	5	38	Adapter5	18.4
	-450-D60-SN12-44	○	○	450	465	300	40	5	44	Adapter6	21.7
	-200-C60-SN15-18	○	○	200	220	80	40	5.5	18	Adapter1	6.9
	-250-C60-SN15-24	○	○	250	270	120	40	5.5	24	Adapter2	9.4
	-315-D60-SN15-30	○	○	315	335	180	40	5.5	30	Adapter3	12.6
	-355-D60-SN15-34	○	○	355	375	220	40	5.5	34	Adapter4	15.2
	-400-D60-SN15-38	○	○	400	420	250	40	5.5	38	Adapter5	18.4
	-450-D60-SN15-44	○	○	450	470	300	40	5.5	44	Adapter6	21.8

### Parts · Ersatzteile

Diameter Durchmesser Ø D	Insert Platte	Wedge Keil	Wedge screw Keilschraube	Wrench Schlüssel	
Ø200-Ø450	SN12	W04N	DM8×21X	WH40T	
	SN15	W05N			

Applicable tool **B9-B15**  
Werkzeug

Tools code key **B24-B25**  
Werkzeug ISO

Grade selection guide **B17-23**  
Sortenauswahl

Technical data **B182-B188**  
Technische Daten

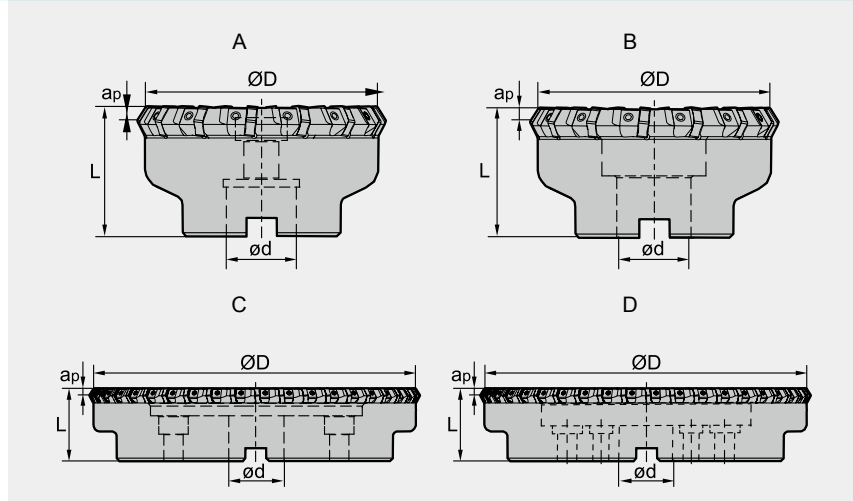


### Face Milling Tools · Planfräser

Kr:58°






### FMD02 **K**



### ■ Specification of tools · Werkzeug Beschreibung

Type · Typ	Stock Lager		Dimension (mm) Abmessung				No. of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)
	R	L	Ø D	Ø D	L	apmax			
<b>FMD02</b> -080-A27-HN09-08	○	○	80	27	50	4	8	A	1.1
-100-B32-HN09-10	○	○	100	32	63	4	10	B	2.6
-125-B40-HN09-14	○	○	125	40	70	4	14	B	3.7
-160-B40-HN09-18	○	○	160	40	63	4	18	B	5.6
-200-C60-HN09-22	○	○	200	60	63	4	22	C	6.3
-250-C60-HN09-28	○	○	250	60	63	4	28	C	10.3
-315-D60-HN09-32	○	○	315	60	63	4	32	D	21.7

### ■ Parts · Ersatzteile

Diameter Durchmesser Ø D	Wedge Keil	Wedge screw Keilschraube	Wrench Schlüssel
Ø80-Ø315	 W06T	 DM6×25	 WH30T



Applicable tool **B9-B15**  
Werkzeug

Tools code key **B24-B25**  
Werkzeug ISO

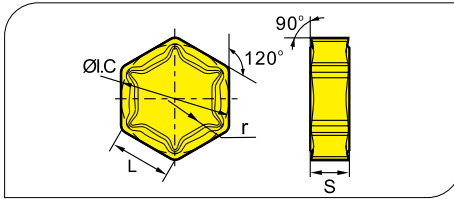
Grade selection guide **B17-23**  
Sortenauswahl

Technical data **B182-B188**  
Technische Daten

# Milling · Fräsen

## Indexable Milling · Fräswendeplatten

### Applicable inserts · Wendeschneidplatten



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

Workpiece Material / Werkstoffe	P	M	K	N	S
Steel / Stahl	●	●	●	●	●
Stainless Steel / Rostfreier Stahl	●	●	●	●	●
Cast iron / Gusseisen			●	●	●
Non-ferrous material / Ne Metalle				●	●
Heat-resistant steel / Warmfester Stahl				●	●

Insert shape / Plattenform	Type · Typ	Dimension (mm) / Abmessung				CVD Coating / CVD Beschicht.						PVD Coating / PVD Beschicht.						Cermet	Carbide uncoat. / unbe. Hartmetall					
		L	I.C.	S	r	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252		YNG151	YNG151C	YC30S	YD051	YD101	YD201
	<b>HNEX090512-DF</b>	9.16	15.875	5.56	1.2					●	●													
	<b>HNEX090512-DM</b>	9.16	15.875	5.56	1.2					●	●													
	<b>HNEX090512-DR</b>	9.16	15.875	5.56	1.2					●	●													

### Chipbreaker Selection FMD02 · Spanbrecher Auswahl FMD02

application / Anwendung	Finishing / Schlichten	Semi-Finishing / Mittlere Bearbeitung	Roughing / Schruppen
<b>K</b>	-DF	-DM	-DR

### Recommended cutting data · Empfohlene Schnittdaten

Workpiece material / Werkstückstoff	Hardness HB / Härte	Grade / Sorte	Cutting data · Schnittdaten			
			V (m/min)	f (mm/z)		
				-DF	-DM	-DR
<b>K</b> Cast iron / Gusseisen	180-250	YBD152	180 (110-250)	0.15 (0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.5)
		YBD252	130 (110-200)	0.2 (0.1-0.2)	0.25 (0.1-0.3)	0.3 (0.2-0.5)

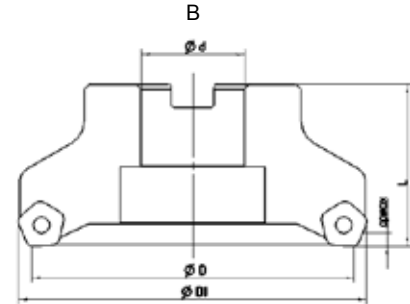
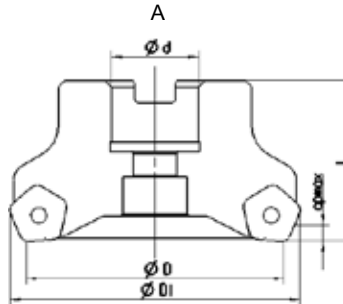
● Ex Stock / ab Lager ○ On demand / auf Anfrage

### Face Milling Tools · Planfräser

Kr:67°




### FMD02



### ■ Specification of tools · Werkzeug Beschreibung

Type · Typ	Stock Lager	Dimension (mm) Abmessung						No. of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)
		R	L	$\varnothing D$	$\varnothing d$	L	$ap_{max}$			
<b>FMD02</b>	-050-A22-PN11-05	●	○	50	22	50	3.5	5	A	0.6
	-063-A22-PN11-06	●	○	63	22	50	3.5	6	A	0.85
	-080-A27-PN11-08	●	○	80	27	50	3.5	8	A	1.2
	-100-B32-PN11-10	●	○	100	32	50	3.5	10	B	1.9
	-125-B40-PN11-12	●	○	125	40	63	3.5	12	B	3.2
	-160-B40-PN11-14	●	○	160	40	63	3.5	14	B	6.4

### ■ Parts · Ersatzteile

Diameter Durchmesser $\varnothing D$	Screw Schraube	Wrench Schlüssel	
	$\varnothing 50$ - $\varnothing 160$	 I60M4×10	

Applicable tool [B9-B15](#)  
Werkzeug

Tools code key [B24-B25](#)  
Werkzeug ISO

Grade selection guide [B17-23](#)  
Sortenauswahl

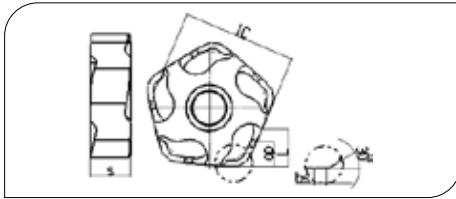
Technical data [B182-B188](#)  
Technische Daten

# Milling · Fräsen

## Indexable Milling · Fräswendeplatten

■ Applicable inserts · Wendeschneidplatten

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



Workpiece Material / Werkstoffe	P	M	K	N	S
Steel / Stahl	●	●	●	●	●
Stainless Steel / Rostfreier Stahl	●	●	●	●	●
Cast iron / Gusseisen			●		
Non-ferrous material / Ne Metalle				●	
Heat-resistant steel / Warmfester Stahl					●

Insert shape Plattenform	Type · Typ	Dimension (mm) Abmessung					CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet	Carbide uncoat. unbe. Hartmetall					
		L	I.C	S	bs	ap	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252		YNG151	YNG151C	YC30S	YD051	YD101	YD201
	PNEG110512R-CR	5	15.875	5.56	1.6	4.0					●	●													
	PNEG110512R-CF	5	15.875	5.56	1.6	4.0					○	○													

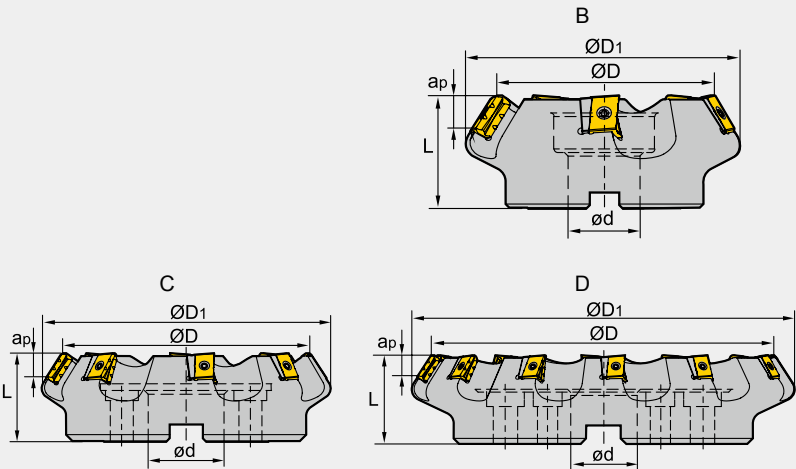
● Ex Stock / ab Lager ○ On demand / auf Anfrage

Kr:60°



### Face Milling Tools · Planfräser






**FMD03** **P** **M**



### Specification of tools · Werkzeug Beschreibung

Type · Typ	Stock Lager	Dimension (mm) Abmessung					inserts WSP	No. of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)
		Ø D	Ø D <sub>1</sub>	Ø D	L	apmax				
<b>FMD03</b>	● ○	125	153	40	63	12	LNKT2007DN-ZR	6	B	4.5
	● ○	160	187	40	63	12		8	C	6.9
	● ○	200	227	60	70	12		10	C	10.5
	● ○	250	276	60	70	12		12	C	13.4
	○ ○	315	339	60	80	12		15	D	26.2
	● ○	125	154	40	63	17	LNKT2510-ZR	5	B	4.5
	● ○	160	189	40	63	17		6	C	6.9
	● ○	200	229	60	70	17		8	C	10.5
	● ○	250	278	60	70	17		10	C	16.7
	○ ○	315	346	60	80	17		12	D	27.3
○ ○	400	427	60	80	17	16		D	47.1	

### Parts · Ersatzteile

Diameter Durchmesser Ø D	Inserts Platten	Screw Schraube	Shim Unterlage	Shim Screw Unterlagen Schraube	Wrench Schlüssel	
						
Ø125-Ø315	LNKT2007DN-ZR	I60M4×15	LLN20R-ZR	I60M3×7	WT15IS	WT10IT
Ø125-Ø400	LNKT2510-ZR	I60M5×17	LLN25R-ZR	I60M3.5×10.4	WT20IS	WT15IT

Applicable tool **B9-B15**  
Werkzeug

Tools code key **B24-B25**  
Werkzeug ISO

Grade selection guide **B17-23**  
Sortenauswahl

Technical data **B182-B188**  
Technische Daten

# Milling · Fräsen

## Indexable Milling · Fräswendeplatten

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

■ Applicable inserts · Wendeschneidplatten

Workpiece Material / Werkstoffe	P	M	K	N	S
Steel / Stahl	●●●●●●●●●●	●●●●●●●●●●	●●●●●●●●●●	●●●●●●●●●●	●●●●●●●●●●
Stainless Steel / Rostfreier Stahl	●●●●●●●●●●	●●●●●●●●●●	●●●●●●●●●●	●●●●●●●●●●	●●●●●●●●●●
Cast iron / Gusseisen	●●●●●●●●●●	●●●●●●●●●●	●●●●●●●●●●	●●●●●●●●●●	●●●●●●●●●●
Non-ferrous material / Ne Metalle	●●●●●●●●●●	●●●●●●●●●●	●●●●●●●●●●	●●●●●●●●●●	●●●●●●●●●●
Heat-resistant steel / Warmfester Stahl	●●●●●●●●●●	●●●●●●●●●●	●●●●●●●●●●	●●●●●●●●●●	●●●●●●●●●●

Insert shape Plattenform	Type · Typ	Dimension (mm) Abmessung				CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.				Cermets		Carbide uncoat. unbe. Hartmetall						
		L	I.W	S	d	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201	
	LNKT2007DN-ZR	20	14	6.35	4,6				●		●				●									
	LNKT2510-ZR	25	18	9.525	5.5				●		●				●									

### Recommended cutting data · Empfohlene Schnittdaten

Workpiece material Werkstückstoff	Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten	
			V (m/min)	f (mm/z)
<b>P</b> Low-carbon steel / Soft steel Niedrig legierte Kohlenstoffstahl Baustahl High-carbon steel / Alloy steel Hoch legierte Kohlenstoffstahl Leg. Stahl	≤180	YBG302	180 (150-300)	0.5 (0.2-0.8)
		YBM351	180 (150-300)	0.5 (0.2-0.8)
	180-280	YBG302	150 (120-280)	0.5 (0.2-0.8)
		YBM351	140 (120-280)	0.5 (0.2-0.8)
280-350	280-350	YBG302	120 (80-250)	0.45 (0.2-0.6)
		YBM351	100 (80-250)	0.45 (0.2-0.6)
<b>M</b> Stainless steel / Rostfreier Stahl	≤270	YBG302	120 (80-200)	0.45 (0.2-0.6)
		YBM351	100 (80-200)	0.45 (0.2-0.6)

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



### Case study for FMD03 Bearbeitungsbeispiel für FMD03



- Tool · Werkzeug: FMD03-315-D60-LN25-12
- Inserts · WSP: LNKT2510-ZR/YBG302

Workpiece material  
Werkstückstoff: ASTMA743 CA-6NM class(HB200)

Cooling system  
Kühlsystem: dry cutting, trocken

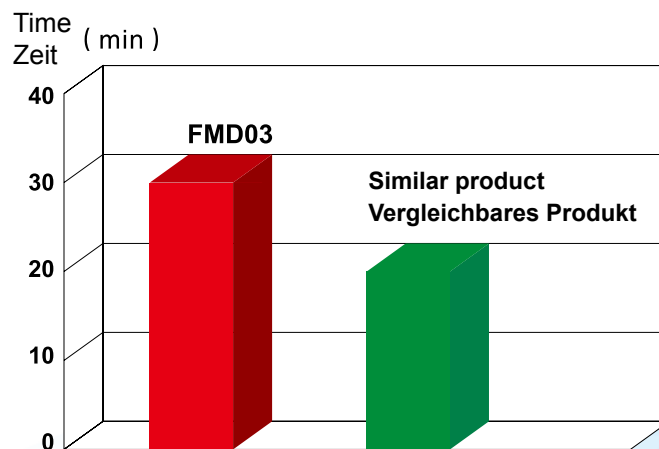
Machine  
Maschine:  
NC floor Type · Typ boring and milling machine,  
spindle power  $\geq 30$  KW  
Bohr-Fräszentrum Spindelkraft 230 KW

Cutting data  
Schnittdaten:

$V_c = 200$  m/min  
 $f_z = 0.3$  mm/z  
 $a_p = 3$  mm



- Wear comparison of insert
- Verschleißvergleich der WSP



\* = Germany 1.4008 Materialvergleichstabelle in Kapitel E

# Milling · Fräsen

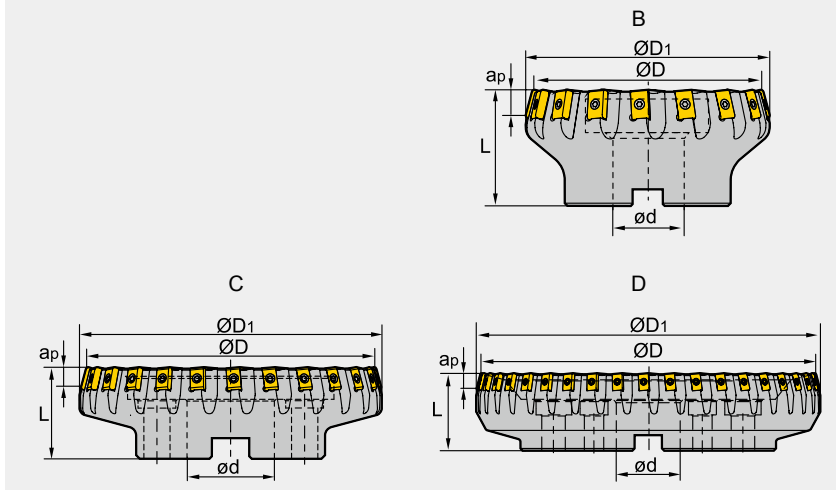
Indexable Milling Tools · Wendepplattenfräser

Kr:75°



## Face Milling Tools · Planfräser

**FME01** **K**



### ■ Specification of tools · Werkzeug Beschreibung

Type · Typ	Stock Lager		Dimension (mm) Abmessung					No. of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)
	R	L	Ø D	Ø D <sub>1</sub>	Ø D	L	ap <sub>max</sub>			
<b>FME01</b> -125-B40-LN15-16	○	○	125	132	40	63	8	16	B	3.5
-160-B40-LN15-20	○	○	160	168	40	63	8	20	B	6.1
-200-C60-LN15-25	○	○	200	208	60	63	8	25	C	7.4
-250-C60-LN15-32	○	○	250	257	60	63	8	32	C	13.1
-315-D60-LN15-40	○	○	315	323	60	70	8	40	D	25.5

### ■ Parts · Ersatzteile

Diameter Durchmesser Ø D	Screw Schraube	Wrench Schlüssel
Ø125-Ø315	I90M4×11	WT09S

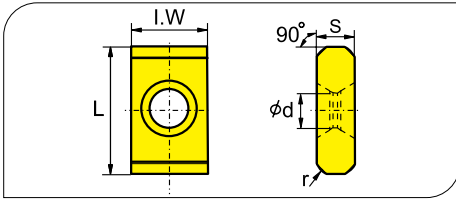


● Ex Stock / ab Lager ○ On demand / auf Anfrage

# Milling · Fräsen

## Indexable Milling · Fräswendeplatten

### Applicable inserts · Wendeschneidplatten



Workpiece Material Werkstoff	Grade	Ideal Machining Condition Gute Bearbeitungsbedingungen		Normal Machining Condition Normale Bearbeitungsbedingungen		Unfavorable Machining Condition Ungünstige Bearbeitungsbedingungen	
		Blue	Yellow	Yellow	Red	Red	Green
<b>P</b> Steel / Stahl		Blue	Blue	Blue	Blue	Blue	Blue
<b>M</b> Stainless Steel / Rostfreier Stahl		Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
<b>K</b> Cast iron / Gusseisen					Red	Red	Red
<b>N</b> Non-ferite material / Ne Metalle							Green
<b>S</b> Heat-resistant steel / Warmfester Stahl					Orange	Orange	Orange

Insert shape Plattenform	Type · Typ	Dimension (mm) Abmessung					CVD Coating CVD Beschicht.					PVD Coating PVD Beschicht.					Cermet	Carbide uncoat. unbe. Hartmetall							
		L	I.W	S	d	r	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302		YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	<b>LNE32.534</b>	15.875	9.525	4.76	4.4	1.6				○	○														
	<b>LNE32.302</b>	15.875	9.525	4.76	4.2	45 Fase			○		○														

### Recommended cutting data · Empfohlene Schnittdaten

Workpiece material Werkstückstoff	Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten	
			V (m/min)	f (mm/z)
<b>K</b> Cast iron Gusseisen	180-250	YBD152	150 (110-190)	0.2 (0.1-0.4)

# Milling · Fräsen

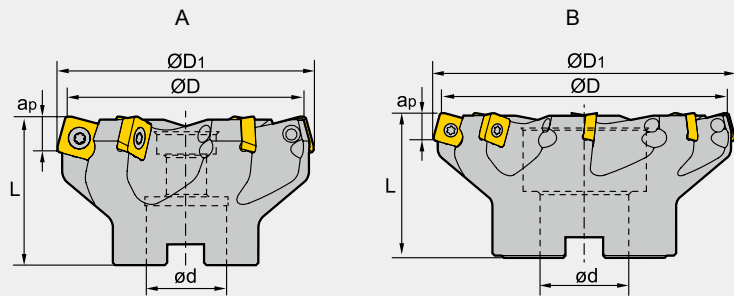
Indexable Milling Tools · Wendepplattenfräser

## Face Milling Tools · Planfräser

Kr:75°





### FME02



### Specification of tools · Werkzeug Beschreibung

Type · Typ	Stock Lager	Dimension (mm) Abmessung					No. of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)
		Ø D	Ø D1	Ø D	L	apmax			
<b>FME02</b> -050-A22-SP12-04	○	50	54	22	40	6	4	A	0.3
-063-A22-SP12-05	○	63	66	22	50	6	5	A	0.6
-080-A27-SP12-06	○	80	83	27	50	6	6	A	0.9
-100-B32-SP12-07	○	100	103	32	50	6	7	B	1.4
-125-B40-SP12-08	○	125	128	40	63	6	8	B	2.5

### Spare Parts · Ersatzteile

Diameter Durchmesser Ø D	Screw Schraube	Wrench Schlüssel
Ø50-Ø125	 I60M5×13.2	 WT20IS

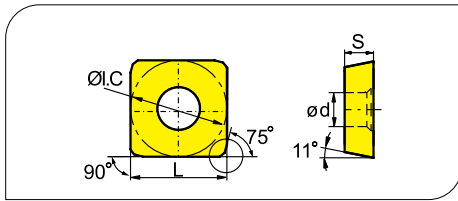


● Ex Stock / ab Lager ○ On demand / auf Anfrage

# Milling · Fräsen

## Indexable Milling · Fräswendepplatten

### Applicable inserts · Wendeschneidplatten



Workpiece Material Werkstoff	Material	Ideal Machining Condition Gute Bearbeitungsbedingungen			Normal Machining Condition Normale Bearbeitungsbedingungen			Unfavorable Machining Condition Ungünstige Bearbeitungsbedingungen		
		●	●	●	●	●	●	●	●	●
P	Steel / Stahl	●	●	●	●	●	●	●	●	●
M	Stainless Steel / Rostfreier Stahl	●	●	●	●	●	●	●	●	●
K	Cast iron / Gusseisen	●	●	●	●	●	●	●	●	●
N	Non-ferrous material / Ne Metalle	●	●	●	●	●	●	●	●	●
S	Heat-resistant steel / Warmfester Stahl	●	●	●	●	●	●	●	●	●

Insert shape Plattenform	Type · Typ	Dimension (mm) Abmessung				CVD Coating CVD Beschicht.					PVD Coating PVD Beschicht.					Cermet	Carbide uncoat. unbe. Hartmetall						
		L	I.C	S	d	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302		YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101
	SPKW1204EDFR	12.7	12.7	4.76	5.56							●											
	SPKW1204EDSR	12.7	12.7	4.76	5.56							●											
	SPKT1204EDR	12.7	12.7	4.76	5.56							●											

### Chipbreaker Selection FME02 · Spanbrecher Auswahl FME02

Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	Roughing Schruppen
<b>P</b>	EDFR	EDR	EDSR
<b>M</b>	EDFR	EDR	
<b>K</b>	EDFR	EDR	

### Recommended cutting data · Empfohlene Schnittdaten

Workpiece material Werkstückstoff	Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten	
			V (m/min)	f (mm/z)
<b>P</b> Low-carbon steel Soft steel	≤180	YBG202	270(200-360)	0.2 (0.1-0.3)
	180-280	YBG202	240 (180-350)	0.2 (0.1-0.3)
	280-350	YBG202	220 (170-340)	0.2 (0.1-0.3)
<b>M</b> Stainless steel Rostfreier Stahl	≤270	YBG202	160 (110-270)	0.2 (0.1-0.3)
<b>K</b> Cast iron Gusseisen	180-250	YBG202	160 (120-200)	0.2 (0.1-0.3)

Applicable tool [D14-D18](#)

Tools code key [B20-B21](#) Grade selection guide [B15-B19](#)

Technical data [B164-B170](#)

# Milling · Fräsen

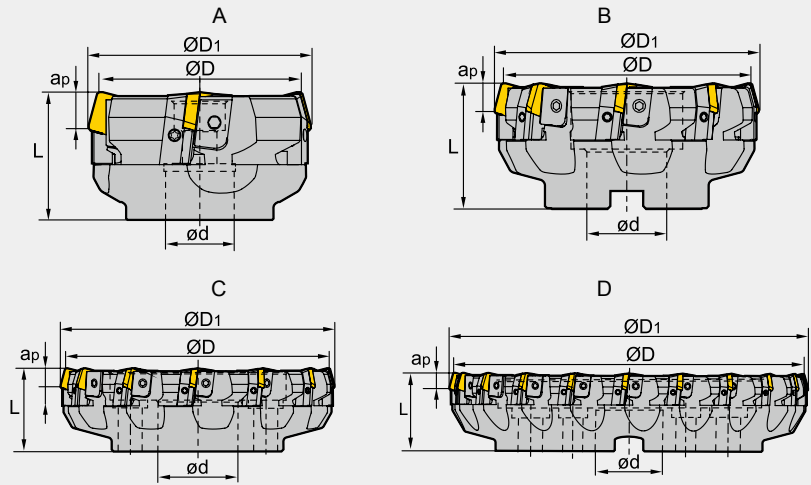
Indexable Milling Tools · Wendeplattenfräser

## Face Milling Tools · Planfräser

Kr:75°



**FME03** P M K



### Specification of tools · Werkzeug Beschreibung

Type · Typ	Stock Lager		Dimension (mm) Abmessung					No. of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)
	R	L	Ø D	Ø D <sub>1</sub>	Ø D	L	ap <sub>max</sub>			
<b>FME03</b> -080-A27-SP12-04	○	○	80	84	27	50	6	4	A	1.1
-100-B32-SP12-06	○	○	100	104	32	50	6	6	B	1.9
-125-B40-SP12-08	○	○	125	129	40	63	6	8	B	3.5
-160-B40-SP12-10	○	○	160	164	40	63	6	10	B	5.7
-200-C60-SP12-12	○	○	200	203	60	63	6	12	C	8.2
-250-C60-SP12-16	○	○	250	253	60	63	6	16	C	13.8
-315-D60-SP12-20	○	○	315	318	60	70	6	20	D	23.5
-080-A27-SP15-04	○	○	80	84	27	50	8	4	A	1.0
-100-B27-SP15-06	○	○	100	104	27	50	8	6	B	1.8
-125-B40-SP15-08	○	○	125	129	40	63	8	8	B	3.3
-160-B40-SP15-10	○	○	160	164	40	63	8	10	B	5.4
-200-C60-SP15-12	○	○	200	204	60	63	8	12	C	7.9
-250-C60-SP15-16	○	○	250	253	60	63	8	16	C	13.6
-315-D60-SP15-20	○	○	315	318	60	70	8	20	D	23.1

### Spare Parts · Ersatzteile

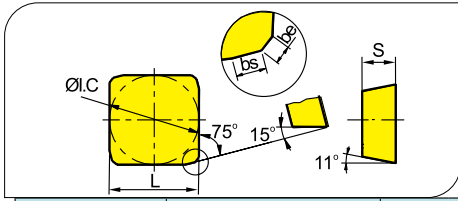
Diameter Durchmesser Ø D	Insert Platte	Cassette Kassette	Wedge Keil	Screw Schraube	Locator screw Schraube	Wrench Schlüssel	
Ø80-Ø100	SP12	LSP12R/L	W04R/L	WM8×17	LOM5×15.1	WT20T WT25T	
Ø125-Ø315				WM8×22			
Ø80-Ø315	SP15	LSP15R/L	W04R/L	WM8×22			

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

# Milling · Fräsen

## Indexable Milling · Fräswendeplatten

■ Applicable inserts · Wendeschneidplatten



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

Workpiece Material / Werkstoffe	P	M	K	N	S
Steel / Stahl	●	●	●	●	●
Stainless Steel / Rostfreier Stahl	●	●	●	●	●
Cast iron / Gusseisen	●	●	●	●	●
Non-ferrous material / Ne Metalle	●	●	●	●	●
Heat-resistant steel / Warmfester Stahl	●	●	●	●	●

Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating / CVD Beschicht.					PVD Coating / PVD Beschicht.					Cermet	Carbide uncoat. / unbe. Hartmetall							
		L	I.C	S	be	bs	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302		YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SPKN1203EDER	12.7	12.7	3.18	1	1.4																			
	SPKN1203EDEL	12.7	12.7	3.18	1	1.4																			
	SPKN1203EDFR (SPKN1203EDR)	12.7	12.7	3.18	1	1.4																	○	●	
	SPKN1203EDFL (SPKN1203EDL)	12.7	12.7	3.18	1	1.4																			●
	SPKN1203EDSKR (SPKN1203EDR)	12.7	12.7	3.18	1	1.4	●						●	●	●							●			
	SPKN1203EDSKL (SPKN1203EDL)	12.7	12.7	3.18	1	1.4									●							●			
	SPKN1203EDTKR (SPKN1203EDTR)	12.7	12.7	3.18	1	1.4																			
	SPKN1203EDTKL	12.7	12.7	3.18	1	1.4																			
	SPKN1203EDS31PR (SPKN1203EDT31R)	12.7	12.7	3.18	1	1.4									○										
	SPKN1203EDS31PL (SPKN1203EDT31L)	12.7	12.7	3.18	1	1.4																			
	SPKN1204EDFL (SPKN1204EDL)	12.7	12.7	4.76	1	1.4																		○	
	SPKN1204EDER (SPKN1204EDR)	12.7	12.7	4.76	1	1.4	●	●														○			
	SPKN1204EDFR	12.7	12.7	4.76	1	1.4																		○	
	SPKN1504EDER	15.875	15.875	4.76	1	1.4																			
	SPKN1504EDEL	15.875	15.875	4.76	1	1.4																			
	SPKN1504EDFR (SPKN1504EDR)	15.875	15.875	4.76	1	1.4																		●	
	SPKN1504EDFL (SPKN1504EDL)	15.875	15.875	4.76	1	1.4																		●	
	SPKN1504EDSKR (SPKN1504EDR)	15.875	15.875	4.76	1	1.4	●						●									●			
	SPKN1504EDSKL (SPKN1504EDL)	15.875	15.875	4.76	1	1.4																●			
	SPKN1504EDTKR (SPKN1504EDR)	15.875	15.875	4.76	1	1.4							●												
	SPKN1504EDTKL	15.875	15.875	4.76	1	1.4																			
	SPKN1504EDS32PR (SPKN1504EDT32R)	15.875	15.875	4.76	1	1.4									●										
	SPKN1504EDS32PL (SPKN1504EDTL)	15.875	15.875	4.76	1	1.4																			
SPKN1504EDT32PR (SPKN1504EDTR)	15.875	15.875	4.76	1	1.4	●																			
SPKN1504EDT32PL (SPKN1504EDTL)	15.875	15.875	4.76	1	1.4																				
	SPKN1904EDFL (SPKN1904EDL)	19.05	19.05	4.76	1	1.4																			
	SPKN1904EDFR (SPKN1904EDR)	19.05	19.05	4.76	1	1.4																			

Applicable tool [D14-D18](#)

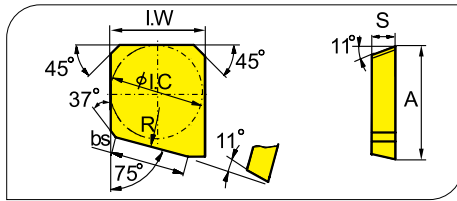
Tools code key [B20-B21](#) Grade selection guide [B15-B19](#)

Technical data [B164-B170](#)

# Milling · Fräsen

## Indexable Milling · Fräswendeplatten

### Applicable inserts · Wendeschneidplatten



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

Workpiece Material / Werkstoffe	P	M	K	N	S
Steel / Stahl	●	●	●	●	●
Stainless Steel / Rostfreier Stahl	●	●	●	●	●
Cast iron / Gusseisen			●	●	●
Non-ferrite material / Ne Metalle				●	●
Heat-resistant steel / Warmfester Stahl				●	●

Insert shape / Plattenform	Type · Typ	Dimension (mm) / Abmessung						CVD Coating / CVD Beschicht.						PVD Coating / PVD Beschicht.		Cermet	Carbide uncoat. / unbe. Hartmetall									
		A	I.C	I.W	S	bs	R	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201	
	<b>SPEX1203EDL-1</b>	15	12.7	12.7	3.18	10	500																			○
	<b>SPEX1203EDR-1</b>	15	12.7	12.7	3.18	10	500																			○
	<b>SPEX1504EDL-1</b>	18.2	15.875	15.875	4.76	10	500																			○
	<b>SPEX1504EDR-1</b>	18.2	15.875	15.875	4.76	10	500																			○

### Edge preparation for FME03 / Schneidkantenausführung für FME03

Edge preparation / Schneidkantenausführung	Recommended selection · Beschreibung
<b>SP**EDER/L</b>	Honing edge is suitable for semi-finish and finish machining steel and stainless steel. Verrundete Schneidkante für mittlere bis Schlichtbearbeitung von Stahl und rostfreiem Stahl.
<b>SP**EDFR/L</b>	Sharp cutting edge is suitable for finish machining cast iron materials. Scharfe Schneidkante für die Schlichtbearbeitung von Gussmaterial.
<b>SP**EDSKR/L</b> <b>SP**EDS**R/L</b>	After chamfering and honing, the edge has strong capability of anti-breakage, suitable for rough machining steel parts in poor conditions. Gefaste Schneidkante mit Verrundung und guter Stabilität. Für Schruppbearbeitung von Stahl auch bei ungünstigen Verhältnissen.
<b>SP**EDTKR/L</b> <b>SP**EDT**R/L</b>	Chamfering edge is suitable for semi-finish and finish machining steel, stainless steel and cast iron materials. Gefaste Schneide für mittlere bis Schlichtbearbeitung von Stahl und rostfreiem Stahl sowie Guss.
<b>SP**EDR/L-GM</b>	3D chipbreaker to reduce cutting force, reinforce the capability of chip control, improve insert life. Widely applied for semi-finish machining steel, stainless steel and cast iron materials. 3-D Spanbrecher für weniger Schnittkräfte, für gute Spankontrolle und höhere Standzeiten. Großer Anwendungsbereich bei der mittlere Bearbeitung von Stahl, rostfreiem Stahl und Guss.

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



### Recommended cutting data · Empfohlene Schnittdaten

Workpiece material Werkstückstoff	Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten		
			V (m/min)	f (mm/z)	
<b>P</b> Low-carbon steel Soft steel Niedrig legierter Kohlenstoffstahl Baustahl	≤180	YBG202 YBG205	270(200-360)	0.2 (0.1-0.4)	
		YBG302	230 (170-350)	0.24 (0.1-0.3)	
		YBM251 YBC301	270(220-350)	0.2 (0.1-0.4)	
		YBM351	220 (180-300)	0.25 (0.15-0.3)	
		YC30S	140 (100-220)	0.22 (0.1-0.3)	
	High-carbon steel Alloy steel Hoch Leg. Kohlenstoffstahl	180-280	YBG202 YBG205	240 (180-350)	0.2 (0.1-0.3)
			YBG302	220 (150-330)	0.24 (0.1-0.3)
			YBM251 YBC301	240 (200-320)	0.2 (0.1-0.4)
			YBM351	200 (160-280)	0.25 (0.15-0.3)
			YC30S	120 (80-200)	0.22 (0.1-0.3)
	Alloy tool steel Leg. Werkzeugstahl	280-350	YBG202 YBG205	220 (170-340)	0.2 (0.1-0.3)
			YBG302	190 (130-300)	0.24 (0.1-0.3)
			YBM251 YBC301	220 (180-300)	0.2 (0.1-0.4)
			YBM351	180 (150-250)	0.25 (0.15-0.3)
			YC30S	100 (60-180)	0.22 (0.1-0.3)
<b>M</b> Stainless steel Rostfreier Stahl	≤270	YBG202 YBG205	160 (110-270)	0.2 (0.1-0.3)	
		YBG302	140 (100-250)	0.24 (0.1-0.3)	
		YBM251	150 (120-240)	0.2 (0.1-0.4)	
		YBM351	140 (100-240)	0.25 (0.15-0.3)	
		YD201	100 (80-160)	0.24 (0.15-0.4)	
<b>K</b> Cast iron Gusseisen	180-250	YBG102	210 (120-300)	0.12 (0.08-0.3)	
		YBG302	160 (120-200)	0.2 (0.1-0.3)	
		YD201	100 (80-160)	0.24 (0.15-0.4)	

# Milling · Fräsen

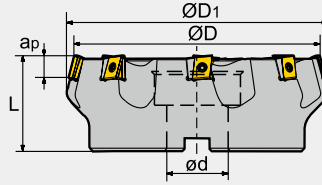
Indexable Milling Tools · Wendeplattenfräser

## Face Milling Tools · Planfräser

Kr:75°



**FME04** P M K



**NEW  
NEU**

### Specification of tools · Werkzeug Beschreibung

Type · Typ	Stock Lager		Dimension (mm) Abmessung					No. of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)	
	R	L	Ø D	Ø D <sub>1</sub>	Ø D	L	a <sub>pmax</sub>				
<b>FME04</b>	-125-B40-LN15-06	●	○	125	137	40	63	8	6	B	3.8
	-160-B40-LN15-08	●	○	160	170	40	63	8	8	C	6.6
	-200-C60-LN15-10	●	○	200	208	60	70	8	10	C	9.6
	-250-C60-LN15-12	●	○	250	257	60	70	8	12	C	13.4
	-315-D60-LN15-16	○	○	315	328	60	80	8	16	D	25.2

### Spare Parts · Ersatzteile

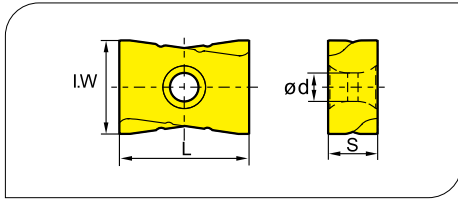
Diameter Durchmesser Ø D	Shim Unterlage	Wedge Keil	Screw Schraube	Wrench Schlüssel
Ø80 Ø100				
Ø125 ~ Ø315	LLN15-ZR	I60M3×7	I60M4×15	WT15IS WT10IS

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

# Milling · Fräsen

## Indexable Milling · Fräswendplatten

### Applicable inserts · Wendeschneidplatten



Workpiece Material Werkstoffe	Material	Ideal Machining Condition Gute Bearbeitungsbedingungen			Normal Machining Condition Normale Bearbeitungsbedingungen			Unfavorable Machining Condition Ungünstige Bearbeitungsbedingungen		
		Blue	Yellow	Red	Blue	Yellow	Red	Blue	Yellow	Red
P	Steel / Stahl	●	●	●	●	●	●	●	●	●
M	Stainless Steel / Rostfreier Stahl	●	●	●	●	●	●	●	●	●
K	Cast iron / Gusseisen	●	●	●	●	●	●	●	●	●
N	Non-ferrite material / Ne Metalle	●	●	●	●	●	●	●	●	●
S	Heat-resistant steel / Warmfester Stahl	●	●	●	●	●	●	●	●	●

Insert shape Plattenform	Type · Typ	Dimension (mm) Abmessung				CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.					Cermet		Carbide uncoat. unbe. Hartmetall					
		L	I.W	S	d	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201	
	<b>LNKT1506EN-ZR</b>	15.875	14	6.35	4.6	●	●	●	●	●				●										

### Recommended cutting data · Empfohlene Schnittdaten

Workpiece material	Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten	
			V (m/min)	f (mm/z)
<b>P</b> Low-carbon steel Soft steel	≤180	YBG302	180 (150-300)	0.5 (0.2-0.8)
		YBM351	180 (150-300)	0.5 (0.2-0.8)
	180-280	YBG302	150 (120-280)	0.5 (0.2-0.8)
		YBM351	140 (120-280)	0.5 (0.2-0.8)
Alloy tool steel Leg. Werkzeugstahl	280-350	YBG302	120 (80-250)	0.45 (0.2-0.6)
		YBM351	100 (80-250)	0.45 (0.2-0.6)
<b>M</b> Stainless steel Rostfreier Stahl	≤270	YBG302	120 (80-200)	0.45 (0.2-0.6)
		YBM351	100 (80-200)	0.45 (0.2-0.6)

# Milling · Fräsen

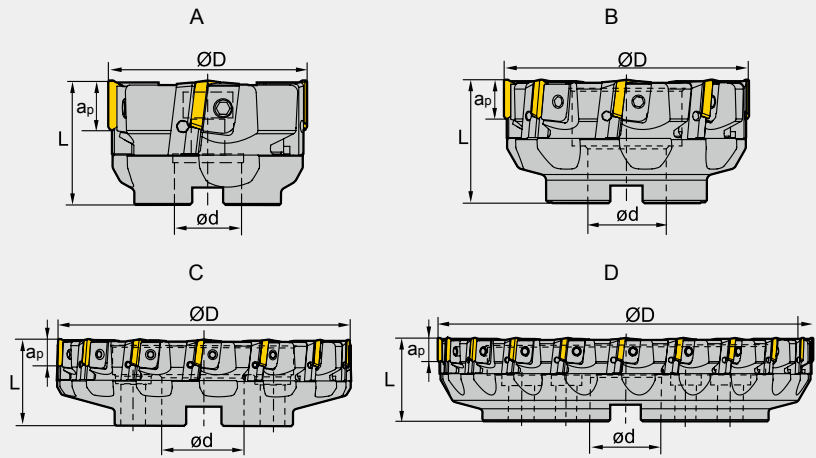
Indexable Milling Tools · Wendeplattenfräser

## Face Milling Tools · Planfräser

Kr:90°



**FMP01** P M K



### Specification of tools · Werkzeug Beschreibung

Type · Typ	Stock Lager	Dimension (mm) Abmessung						No. of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)
		R	L	Ø D	Ø D	L	apmax			
<b>FMP01</b> -080-A27-TP22-04	● ○	●	○	80	27	50	18	4	A	1.2
-100-B32-TP22-06	● ○	●	○	100	32	50	18	6	B	1.7
-125-B40-TP22-08	● ○	●	○	125	40	63	18	8	B	3.2
-160-B40-TP22-10	● ○	●	○	160	40	63	18	10	B	5.1
-200-C60-TP22-12	● ○	●	○	200	60	63	18	12	C	7.4
-250-C60-TP22-16	○ ○	○	○	250	60	63	18	16	C	12.3
-315-D60-TP22-20	○ ○	○	○	315	60	70	18	20	D	21.9

### Spare Parts · Ersatzteile

Diameter Durchmesser Ø D	Cassette Kassette	Wedge Keil	Screw Schraube	Locator screw Schraube	Wrench Schlüssel
Ø80 Ø100	LTP4R1/L1	W04R/L	WM8×17	LOM5×15.1	WT20T
Ø125 ~ Ø315	LTP4R/L		WM8×22		WT25T



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



# Milling · Fräsen

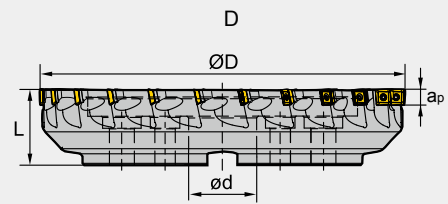
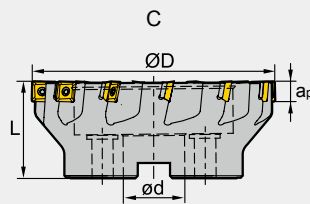
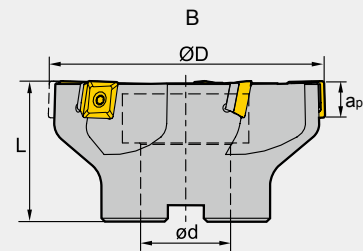
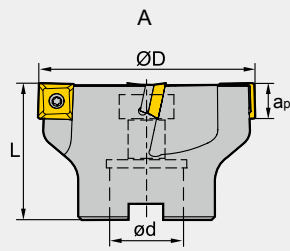
Indexable Milling Tools · Wendeplattenfräser

Kr:90°



## Face Milling Tools · Planfräser

**FMP02** P M K



### ■ Specification of tools · Werkzeug Beschreibung







Type · Typ	Stock Lager	Dimension (mm) Abmessung				No. of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)
		Ø D	Ø D	L	apmax			
<b>FMP02</b> -050-A22-SE09-05	●	50	22	40	6.7	5	A	0.3
-063-A22-SE09-06	●	63	22	40	6.7	6	A	0.5
-080-A27-SE09-08	●	80	27	50	6.7	8	A	0.9
-100-B32-SE09-08	○	100	32	50	6.7	8	B	1.7
-100-B32-SE09-10	○	100	32	50	6.7	10	B	1.7
-125-B40-SE09-12	○	125	40	63	6.7	12	B	2.6

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

### ■ Specification of tools · Werkzeug Beschreibung

Type · Typ	Stock Lager	Dimension (mm) Abmessung				No. of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)	
		Ø D	Ø D	L	a <sub>pmax</sub>				
<b>FMP02</b>	-050-A22-SE12-03	○	50	22	40	10.8	3	A	0.3
	-063-A22-SE12-04	○	63	22	40	10.8	4	A	0.4
	-080-A27-SE12-04	○	80	27	50	10.8	4	A	0.9
	-100-B32-SE12-05	○	100	32	50	10.8	5	B	1.2
	-125-B40-SE12-06	○	125	40	63	10.8	6	B	3.1
	-160-C40-SE12-08	○	160	40	63	10.8	8	C	4.1
	-250-C60-SE12-12	○	250	60	63	10.8	12	C	11.1
	-050-A22-SE12-04	●	50	22	40	10.8	4	A	0.3
	-063-A22-SE12-05	●	63	22	40	10.8	5	A	0.4
	-080-A27-SE12-06	●	80	27	50	10.8	6	A	0.8
	-100-B32-SE12-07	●	100	32	50	10.8	7	B	1.2
	-125-B40-SE12-08	●	125	40	63	10.8	8	B	3.0
	-160-C40-SE12-12	●	160	40	63	10.8	12	C	3.9
	-050-A22-SE12-05	●	50	22	40	10.8	5	A	0.2
	-063-A22-SE12-06	●	63	22	40	10.8	6	A	0.4
	-080-A27-SE12-08	●	80	27	50	10.8	8	A	0.8
	-100-B32-SE12-10	●	100	32	50	10.8	10	B	1.2
	-125-B40-SE12-12	●	125	40	63	10.8	12	B	2.9
	-200-C60-SE12-16	●	200	60	63	10.8	16	C	6.1
	-250-C60-SE12-18	●	250	60	63	10.8	18	C	10.9
-315-D60-SE12-24	○	315	60	63	10.8	24	D	21.6	

### ■ Spare Parts · Ersatzteile

Diameter Durchmesser Ø D	Insert Platte	shim Unterlage	Screw Schraube	shim UnterlageScrew Schraube	Wrench Schlüssel	Wrench Schlüssel	
							
Ø50 ~ Ø125	SE09	--	I60M3×7	--	WT09IS	--	
Ø50	SE12	--	I60M3.5×10	--	WT15IS	--	
Ø63 ~ Ø315		S12BSX	I60M3.5×12	SM5×7XA		WH35L	

Applicable tool **B9-B15**  
Werkzeug

Tools code key **B24-B25**  
Werkzeug ISO

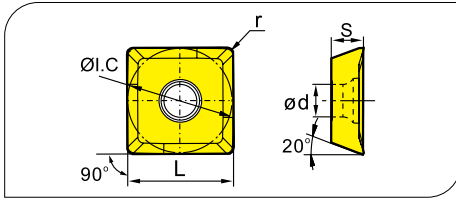
Grade selection guide **B17-23**  
Sortenauswahl

Technical data **B182-B188**  
Technische Daten

# Milling · Fräsen

## Indexable Milling · Fräswendeplatten

### Applicable inserts · Wendeschneidplatten



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

Workpiece Material / Werkstoffe	P	M	K	N	S
Steel / Stahl	●	●	●	●	●
Stainless Steel / Rostfreier Stahl	●	●	●	●	●
Cast iron / Gusseisen			●		
Non-ferrite material / Ne Metalle				●	
Heat-resistant steel / Warmfester Stahl					●

Insert shape Plattenform	Type · Typ	Dimension (mm) Abmessung					CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.					Cermet	Carbide uncoat. unbe. Hartmetall									
		L	I.C.	S	d	r	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152		YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201			
	SEET09T308PER-PF	9.525	9.525	4.01	3.3	0.8											●											
	SEET09T308PER-PM	9.525	9.525	4.01	3.3	0.8											●											
	SEET09T308PER-PR	9.525	9.525	4.01	3.3	0.8									●													
	SEET120308PER-PF	13.308	13.308	4.04	4.1	0.8	●			●							●											
	SEET120308PER-PM	13.308	13.308	4.04	4.1	0.8				●	●	●	●				●	●		●								
	SEET120308PER-PR	13.308	13.308	4.04	4.1	0.8				●	●						○	○										
	SEET120308-LH	13.308	13.308	4.04	4.1	0.8											●											●

### Chipbreaker Selektion FMP02 · Spanbrecher Auswahl FMP02

Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	Roughing Schruppen
<b>P</b>	<b>PF</b> 	<b>PM</b> 	<b>PR</b> 
<b>M</b>			
<b>K</b>			
<b>N</b>		<b>LH</b>	

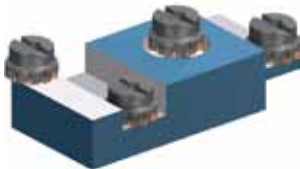
● Ex Stock / ab Lager ○ On demand / auf Anfrage



# Features of **FMP02** series milling cutters Merkmale des Frässystems

## High economical efficiency

### Hohe wirtschaftliche Effizienz



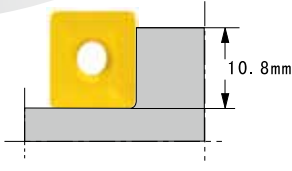
FMP02 series square shoulder mills can carry out a variety of cutting operations including face, vertical square shoulder, slot etc. Coarse pitch, close pitch and extra close pitch, each has a unique merit. Inserts' chipbreakers and grades are applied and optimized for a long tool life, they can achieve high efficiency machining in different condition. Each insert has 4 cutting edge, high economical efficiency.

Das universelle Frässystem FMP02 wird für unterschiedliche Fräsoperationen eingesetzt, z.B. Planfräsen, Eckfräsen, Nutenfräsen etc.

Fräser mit weiter, enger und extraenger Teilung, Wendeschneidplatten in verschiedenen Sorten und Spanbrechern ermöglichen eine optimale Bearbeitung mit hoher Wirtschaftlichkeit; jede Wendeschneidplatte hat 4 Schneidkanten.

## High productivity

### Hohe Produktivität



The major cutting edge is a  $\alpha$ -curve, therefore the S Type inserts makes the tool obtain a ideal  $90^\circ$  approach angle while the minor cutting edge angle is enough. It ensures stable cutting operation. The maximum cutting depth can reach 10.8 mm, and the maximum feed rate can reach 0.3mm/z

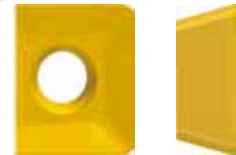
Die Hauptschneide ist wellenförmig ausgebildet, erzielt einen idealen  $90^\circ$  Einstellwinkel und eine stabile Bearbeitung. Die maximale Schnitttiefe beträgt 10,8 mm bei einem maximalen Vorschub von 0,3 mm/z.

Large positive rake angle design makes cutting light and fast.

Großer positiver Spanwinkel für leichte und schnelle Bearbeitung.

## Less cutting force

### Geringe Schnittkräfte



Simple screw clamping, inserts displacement is convenient. The chip pocket of rake face is big enough for smooth chip removal.

Durch die Schraubenklemmung ist einfacher Schneiden- bzw. Schneidplattenwechsel gegeben.

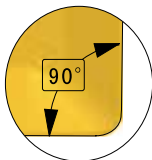


## Easy & convenient to apply

### Einfacher & schneller Schneidenwechsel

## High precision

### Hohe Präzision



Special structure design and fine manufacture make the tools possess very high precision, greatly improve the workpiece precision and surface quality.

Die spezielle Konstruktion und die

präzise Herstellung der Schneidplatte garantieren eine verbesserte Genauigkeit und Oberfläche des Werkstückes.

Adopting the carbide shim machined precisely to protect tool body, enable tool durable and long life.

Die präzise Hartmetall-Zwischenlage schützt den Fräskörper und bringt eine hohe Werkzeuglebensdauer.

## High reliability

### Hohe Werkzeugstabilität & Sicherheit



# Milling · Fräsen

Indexable Milling Tools · Wendepplattenfräser

## Recommended cutting data · Empfohlene Schnittdaten

Workpiece material Werkstückstoff	Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten				
			V (m/min)	f (mm/z)			
				-PF	-PM	-PR	
<b>P</b> Low-carbon steel Soft steel Niedrig legierter Kohlenstoffstahl Baustahl  High-carbon steel Alloy steel Hoch Leg. Kohlenstoffstahl Leg. Stahl	≤180	YBM251	270(220-350)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)	
		YBG202	270(200-360)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)	
		YBG302	230 (170-350)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)	
	180—280	YBM251	240 (200-320)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)	
		YBG202	240 (180-350)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)	
		YBG302	220 (150-330)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)	
	280—350	YBM251	220 (180-300)	0.1(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)	
		YBG202	220 (170-340)	0.1(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)	
		YBG302	190 (130-300)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)	
<b>M</b> Stainless steel Rostfreier Stahl	≤270	YBM251	150 (120-240)	0.1(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)	
		YBG202	160 (110-270)	0.1(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)	
		YBG302	140 (100-250)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)	
<b>K</b> Cast iron Gusseisen	180—250	YBG102	210 (120-300)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)	
		YBG202	160 (120-200)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)	
		YBD252	200 (150-250)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)	
				-LH			
<b>N</b>	Al alloy leg. Alu	-	YD101	300-	0.15 (0.05-0.3)		

**B**

Milling Tools · Fräser



### Case study for FMP02 Bearbeitungsbeispiel für FMP02



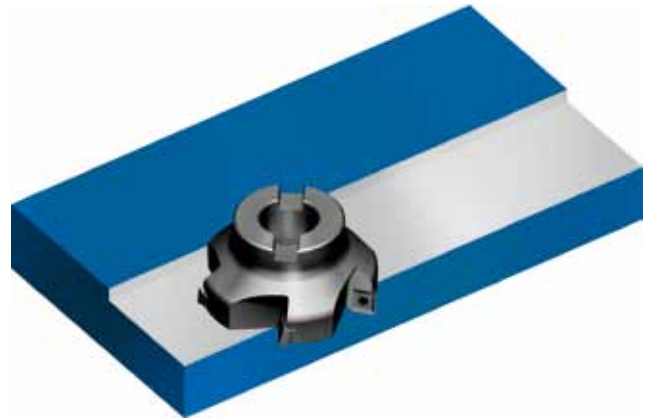
- Tool · Werkzeug: FMP02-100-B32-SE12-054
- Inserts · WSP: SEET120308PER-PM/YBD252

Workpiece material  
Werkstückstoff: HT300/ GG30 (HB150)  
Cooling system  
Kühlsystem: dry cutting, trocken

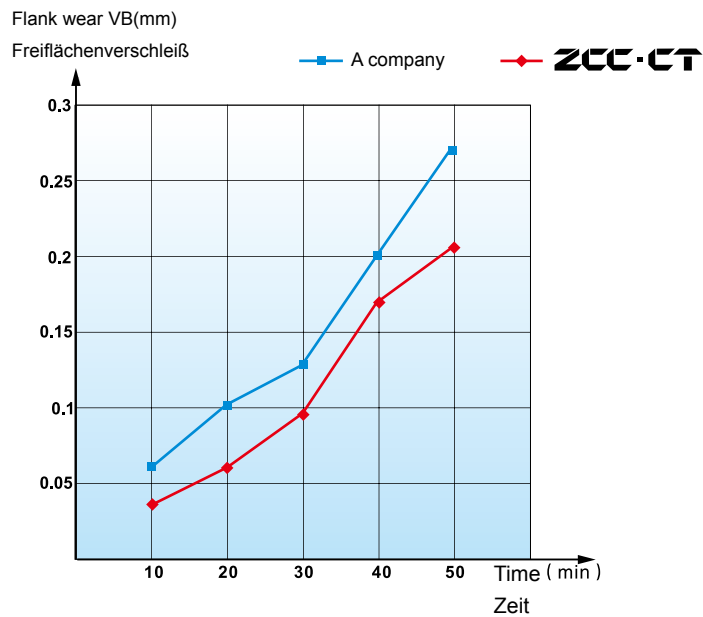
Machine: vertical machining center  
Maschine: vertikales Maschinencenter

Cutting data  
Schnittdaten:  
 $V_c=200\text{m/min}$   
 $a_p=3\text{mm}$   
 $f_z=0.2\text{mm/z}$

$a_e=80\text{mm}$



- Wear comparison of insert.
- Verschleißvergleich der WSP.



# Milling · Fräsen

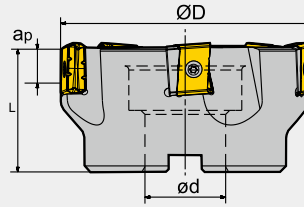
Indexable Milling Tools · Wendepplattenfräser

## Face Milling Tools · Planfräser

Kr:90°

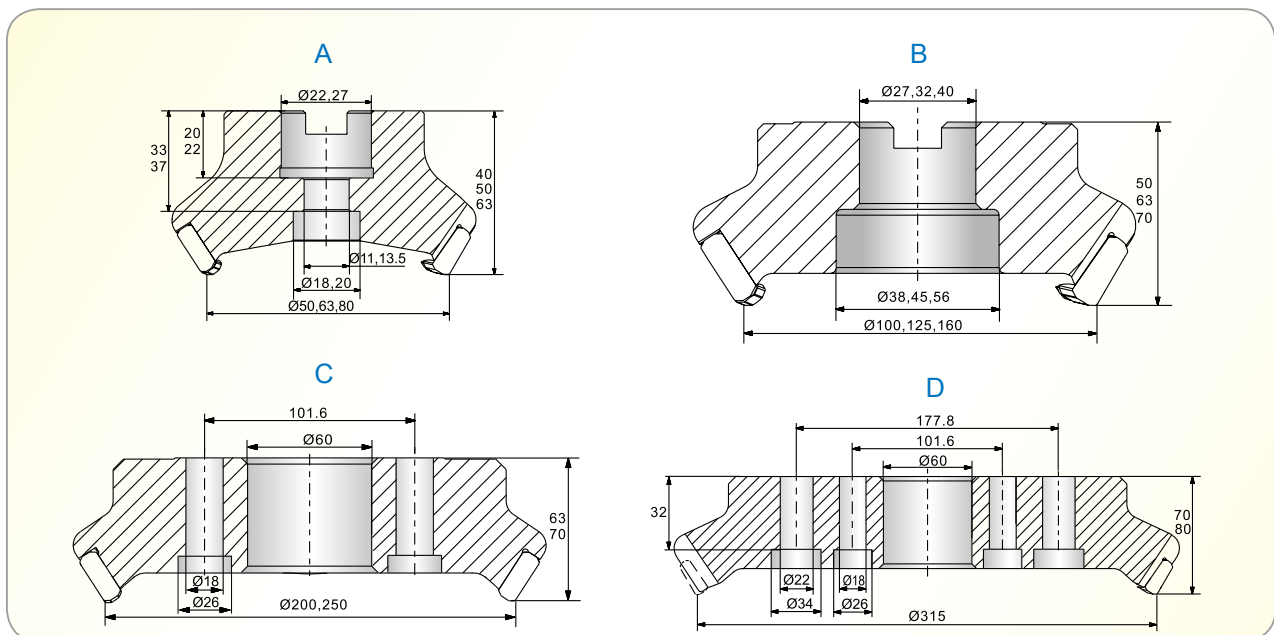


**FMP03 P M K**



**NEW  
NEU**

Type · Typ	Stock Lager		Ø D	Ø D	L	a <sub>pmax</sub>	No. of teeth Zähne	Insert · WSP	Coupling Aufnahme	Weight Gewicht (kg)	
	R	L									
<b>FMP03</b>	-125-B40-LN15-06	●	○	125	40	63	8	6	LNKT1506EN-ZR	B	3.2
	-160-C40-LN15-08	●	○	160	40	63	8	8		C	5.1
	-200-C60-LN15-10	●	○	200	60	70	8	10		C	7.5
	-250-C60-LN15-12	●	○	250	60	70	8	12		C	12.2
	-315-D60-LN15-16	●	○	315	60	80	8	16		D	23.7
	-125-B40-LN20-06	○	○	125	40	63	12	6	LNKT2007DN-ZR	B	3.3
	-160-C40-LN20-08	●	○	160	40	63	12	8		C	5.3
	-200-C60-LN20-10	●	○	200	60	70	12	10		C	8.8
	-250-C60-LN20-12	●	○	250	60	70	12	12		C	14.0
	-315-D60-LN20-15	○	○	315	60	80	12	15		D	23.9
	-125-B40-LN25-05	●	○	125	40	63	15	5	LNKT2510-ZR	B	3.3
	-160-C40-LN25-06	●	○	160	40	63	15	6		C	5.1
-200-C60-LN25-08	●	○	200	60	70	15	8	C		8.9	
-250-C60-LN25-10	●	○	250	60	70	15	10	C		12.0	
-315-D60-LN25-12	●	○	315	60	80	15	12	D		21.9	



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



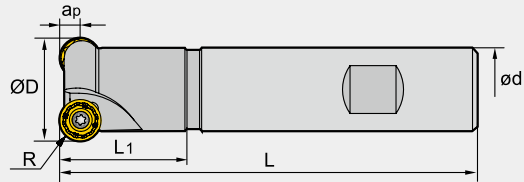
# Milling · Fräsen

Indexable Milling Tools · Wendeplattenfräser

## Face Milling Tools · Planfräser






**FMR01** **P** **M** **K**



### Specification of tools · Werkzeug Beschreibung

Type · Typ	Stock Lager	Dimension (mm) Abmessung						No. of teeth Zähne	Weight Gewicht (kg)
		Ø D	Ø D	L	L <sub>1</sub>	R	apmax		
<b>FMR01</b> -025-XP20-RC10-02	●	25	20	100	30	5	5	2	0.2
-032-XP25-RC10-02	●	32	25	120	35	5	5	2	0.5
-040-XP32-RC12-03	●	40	32	120	40	6	6	3	0.7
-050-XP32-RC12-03	●	50	32	120	40	6	6	3	0.8

### Spare Parts · Ersatzteile

Diameter Durchmesser Ø D	Wrench Schlüssel	Wrench Schlüssel
Ø25 - Ø32	 I60M4×8.4	 WT15S
Ø40 - Ø50	 I60M3.5×10	

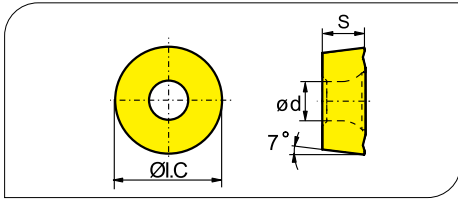


● Ex Stock / ab Lager ○ On demand / auf Anfrage

# Milling · Fräsen

## Indexable Milling · Fräswendeplatten

### Applicable inserts · Wendeschneidplatten



Workpiece Material Werkstoff	Material	Ideal Machining Condition Gute Bearbeitungsbedingungen			Normal Machining Condition Normale Bearbeitungsbedingungen			Unfavorable Machining Condition Ungünstige Bearbeitungsbedingungen		
		●	●	●	●	●	●	●	●	●
<b>P</b>	Steel / Stahl	●	●	●	●	●	●	●	●	●
<b>M</b>	Stainless Steel / Rostfreier Stahl	●	●	●	●	●	●	●	●	●
<b>K</b>	Cast iron / Gusseisen	●	●	●	●	●	●	●	●	●
<b>N</b>	Non-ferrous material / Ne Metalle	●	●	●	●	●	●	●	●	●
<b>S</b>	Heat-resistant steel / Warmfester Stahl	●	●	●	●	●	●	●	●	●

Insert shape Plattenform	Type · Typ	Dimension (mm) Abmessung				CVD Coating CVD Beschicht.					PVD Coating PVD Beschicht.					Cermets YNG151 YNG151C	Carbide uncoat. unbe. Hartmetall				
		R	I.C	S	d	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302		YBG152	YBG252	YC30S	YD051	YD101
	<b>RCKT10T3MO-DM</b>	5	10.0	3.97	4.4	●	●							○							
	<b>RCKT1204MO-DM</b>	6	12.0	4.76	4.0	●	●	●	●	○				○							
	<b>RCKT1204MO-DR</b>	6	12.0	4.76	4.0	●	●	●	●												

### Recommended cutting data · Empfohlene Schnittdaten

Workpiece material Werkstückstoff	Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten			
			V (m/min)	f (mm/z)		
				-DM	-DR	
<b>P</b> Low-carbon steel Soft steel Niedrig legierter Kohlenstoffstahl Baustahl	≤180	YBM251	270 (220-350)	0.2(0.1-0.5)	0.3 (0.2-0.8)	
		YBC301				
		YBM351	220 (180-300)	0.25(0.1-0.5)	0.3 (0.2-0.8)	
	High-carbon steel Alloy steel Hoch Leg. Kohlenstoffstahl Leg. Stahl	180-280	YBC301	240 (200-320)	0.2(0.1-0.5)	0.3 (0.2-0.8)
			YBM351	200 (160-280)	0.25(0.1-0.5)	0.3 (0.2-0.8)
			YBG302			
Alloy tool steel Leg. Werkzeugstahl	280-350	YBG202	270 (200-360)	0.2(0.1-0.5)	0.3 (0.2-0.8)	
		YBM251	220 (180-300)	0.2(0.1-0.4)	0.3 (0.2-0.6)	
		YBC301				
<b>M</b> Stainless steel Rostfreier Stahl	≤270	YBM351	150 (100-220)	0.2(0.1-0.5)	0.3 (0.2-0.8)	
		YBM251	150 (120-240)	0.2(0.1-0.4)	0.3 (0.2-0.6)	
		YBG202	160 (110-270)	0.2(0.1-0.4)	0.3 (0.2-0.6)	
<b>K</b> Cast iron Gusseisen	180-250	YBG302	210 (120-300)	0.2(0.1-0.5)	0.3 (0.2-0.8)	

# Milling · Fräsen

Indexable Milling Tools · Wendeplattenfräser

## Case study for FMR01 Bearbeitungsbeispiel für FMR01

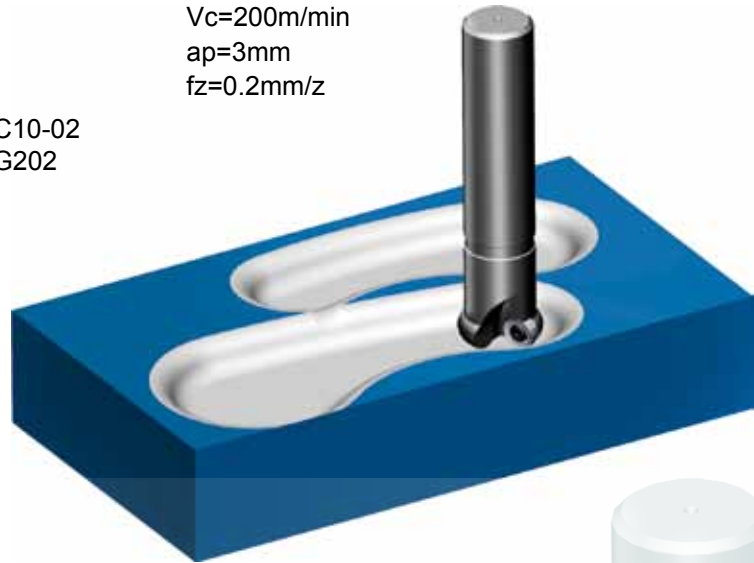


- Tool · Werkzeug: FMR01-025-XP20-RC10-02
- Inserts · WSP: RCKT10T3MO-DM/YBG202

Workpiece material  
Werkstückstoff: 42CrMo (HRC35)  
Cooling system  
Kühlsystem: dry cutting, trocken

Machine: vertical machining center  
Maschine: vertikales Maschinencenter

Cutting data  
Schnittdaten:  
 $V_c=200\text{m/min}$   
 $a_p=3\text{mm}$   
 $f_z=0.2\text{mm/z}$



- Wear comparison of insert.
- Verschleißvergleich der WSP.

**ZCC-CT**



22 minutes later

Other company product

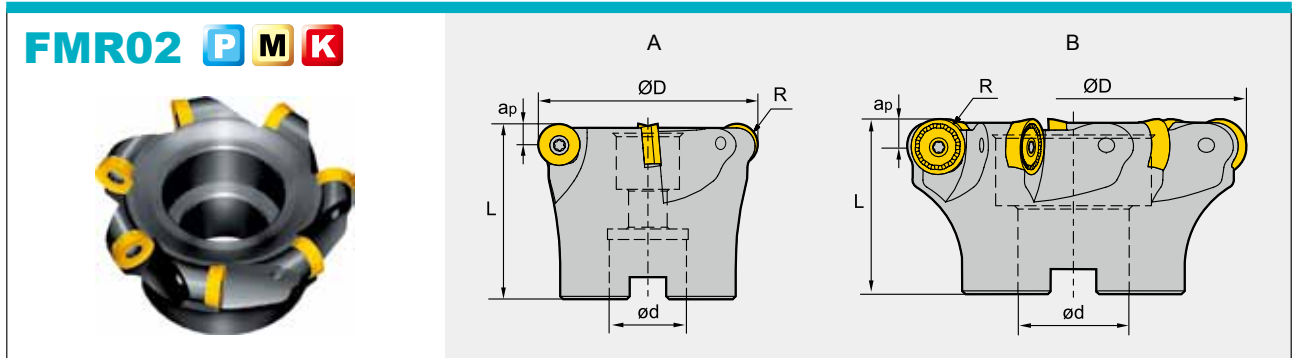


22 minutes later








### Face Milling Tools · Planfräser




#### ■ Specification of tools · Werkzeug Beschreibung

Type · Typ	Stock Lager	Dimension (mm) Abmessung					No. of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)	
		Ø D	Ø D	L	R	apmax				
<b>FMR02</b>	063-A22-RC12-04	●	63	22	50	6	6	4	A	0.7
	063-A22-RC12-04C	○	63	22	50	6	6	4	A	
	063-A22-RC12-06	●	63	22	50	6	6	6		
	063-A22-RC16-04	●	63	22	50	8	8	4		
	080-B27-RC16-05	●	80	27	50	8	8	5	B	0.7
	080-B27-RC16-05C	○	80	27	50	8	8	5	B	
	080-B27-RC20-04	○	80	27	50	10	10	4		
	100-B32-RC16-06	●	100	32	63	8	8	6	B	1.2
	100-B32-RC20-05	●	100	32	63	10	10	5		
	100-B32-RC20-06	○	100	32	63	10	10	6		
	125-B40-RC20-06	●	125	40	63	10	10	6		
	125-B40-RC20-07	●	125	40	63	10	10	7	B	2.2
160-B40-RC20-08	●	160	40	63	10	10	8	B	4.2	
250-B40-RC20-10	○	250	40	63	10	10	10			

#### ■ Spare Parts · Ersatzteile

Diameter Durchmesser Ø D	Insert WSP	Screw Schraube	Wrench Schlüssel	
				
Ø63	RC12	I60M3.5×10	WT15IS	--
Ø80 - Ø100	RC16	I60M5×13	--	WT20IT
Ø125 - Ø160	RC20	I43M6×16	--	WT25IT



Applicable tool **B9-B15**  
Werkzeug

Tools code key **B24-B25**  
Werkzeug ISO

Grade selection guide **B17-23**  
Sortenauswahl

Technical data **B182-B188**  
Technische Daten

# Milling · Fräsen

## Indexable Milling · Fräswendeplatten

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

P Steel / Stahl  
M Stainless Steel / Rostfreier Stahl  
K Cast iron / Gusseisen  
N Non-ferrite material / Ne Metalle  
S Heat-resistant steel / Warmfester Stahl

Insert shape Plattenform	Type · Typ	Dimension (mm) Abmessung				CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.					Cermet	Carbide uncoat. unbe. Hartmetall							
		R	I.C	S	d	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152		YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201	
	RCKT10T3MO-DM	5	10.0	3.97	4.4	●	●							○											
	RCKT1204MO-DM	6	12.0	4.76	4.0	●	●	●	●				○												
	RCKT1204MO-DR	6	12.0	4.76	4.0	●	●	●	●																
	RCKT1606MO-DM	8	16	6.35	5.56	●	●	○						○											
	RCKT1606MO-DR	8	16	6.35	5.56	●	●		●		●														
	RCKT2006MO-DM	10	20	6.35	6.55	●	●																		
	RCKT2006MO-DR	10	20	6.35	6.55	●	●		●		●														

### Recommended cutting data · Empfohlene Schnittdaten

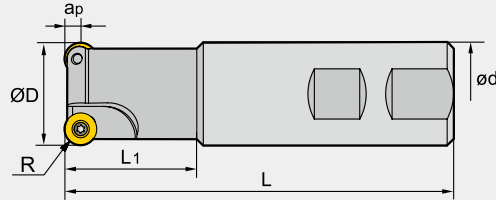
Workpiece material Werkstückstoff	Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten			
			V (m/min)	f (mm/z)		
				-DM	-DR	
<b>P</b> Low-carbon steel / Soft steel Niedrig legierter Kohlenstoffstahl Baustahl  High-carbon steel / Alloy steel Hoch Leg. Kohlenstoffstahl  Alloy tool steel / Leg. Werkzeugstahl	≤180	YBM251	270 (220-350)	0.2(0.1-0.5)	0.3 (0.2-0.8)	
		YBC301	220 (180-300)	0.25(0.1-0.5)	0.3 (0.2-0.8)	
		YBG302	270 (200-360)	0.2(0.1-0.5)	0.3 (0.2-0.8)	
	180-280	YBM251	240 (200-320)	0.2(0.1-0.5)	0.3 (0.2-0.8)	
		YBM351	200 (160-280)	0.25(0.1-0.5)	0.3 (0.2-0.8)	
		YBG302	240 (180-350)	0.2(0.1-0.5)	0.3 (0.2-0.8)	
	280-350	YBG202	220 (180-300)	0.2(0.1-0.4)	0.3 (0.2-0.6)	
		YBM251	180 (150-250)	0.2(0.1-0.5)	0.3 (0.2-0.8)	
		YBG302	220 (170-340)	0.2(0.1-0.4)	0.3 (0.2-0.6)	
<b>M</b> Stainless steel / Rostfreier Stahl	≤270	YBM251	150 (120-240)	0.2(0.1-0.4)	0.3 (0.2-0.6)	
		YBM351	150 (100-220)	0.2(0.1-0.4)	0.3 (0.2-0.6)	
		YBG202	160 (110-270)	0.2(0.1-0.4)	0.3 (0.2-0.6)	
<b>K</b> Cast iron / Gusseisen	180-250	YBG302	210 (120-300)	0.2(0.1-0.5)	0.3 (0.2-0.8)	

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



### Face Milling Tools · Planfräser


**FMR03** P M K



### ■ Specification of tools · Werkzeug Beschreibung

Type · Typ	Stock Lager	Dimension (mm) Abmessung							No. of teeth Zähne	Weight Gewicht (kg)
		Ø D	Ø d	L	L <sub>1</sub>	R	ap <sub>max</sub>			
<b>FMR03</b> -016-XP16-RD08-02	○	16	16	100	25	4	4	2	0.1	
-025-XP25-RD08-02	●	25	25	100	30	4	4	2	0.3	
-032-XP32-RD10-02	●	32	32	120	40	5	5	2	0.7	
-040-XP32-RD12-03	●	40	32	120	40	6	6	3	0.7	
-050-XP32-RD12-04	●	50	32	120	40	6	6	4	0.8	

### ■ Spare Parts · Ersatzteile

Diameter Durchmesser Ø D	Screw Schraube	Wrench Schlüssel	
Ø25	I60M3×7	WT09IP	
Ø32-Ø50	I60M4×10	WT15IP	

Applicable tool B9-B15  
Werkzeug

Tools code key B24-B25  
Werkzeug ISO

Grade selection guide B17-23  
Sortenauswahl

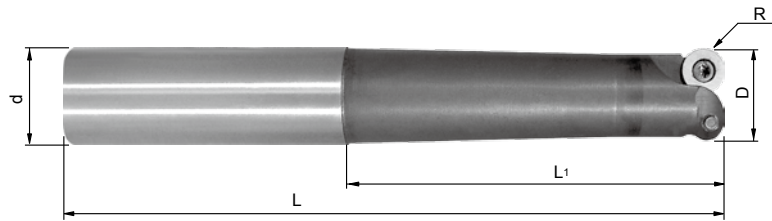
Technical data B182-B188  
Technische Daten

# Milling · Fräsen

Indexable Milling Tools · Wendepplattenfräser

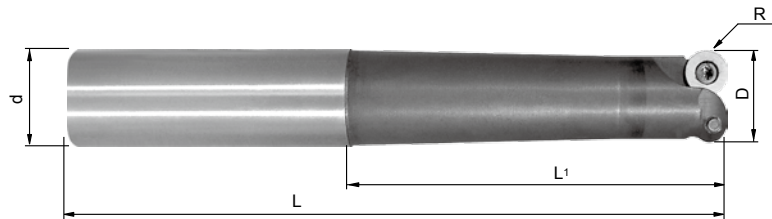
## Face Milling Tools · Planfräser

**FMR03** **P** **M** **K**



Type · Typ	Stock Lager	Dimension (mm) Abmessung						No. of teeth Zähne
		Ø D	Ø d	L	L <sub>1</sub>	R	a <sub>pmax</sub>	
<b>FMR03</b> -015-G16-XS RD0702-02	○	15	16	88	40	3.5	3.5	2
-015-G16-S RD0702-02	○	15	16	108	60	3.5	3.5	2
-015-G20-M RD0702-02	○	15	20	130	80	3.5	3.5	2
-015-G20-L RD0702-02	○	15	20	150	100	3.5	3.5	2
-015-G25-XL RD0702-02	○	15	25	120	176	3.5	3.5	2

Inserts · WSP: RDKW0702MO\*\* / RDKW1003MO\*\*



Type · Typ	Stock Lager	Dimension (mm) Abmessung						No. of teeth Zähne
		Ø D	Ø d	L	L <sub>1</sub>	R	a <sub>pmax</sub>	
<b>FMR03</b> -020-G20-XS RD1003-02	○	20	20	90	40	5	5	2
-020-G20-S RD1003-02	○	20	20	110	60	5	5	2
-020-G25-M RD1003-02	○	20	25	136	80	5	5	2
-020-G25-L RD1003-02	○	20	25	156	100	5	5	2
-020-G25-XL RD1003-02	○	20	25	176	120	5	5	2

Inserts · WSP: RDKW0702MO\*\* / RDKW1003MO\*\*

### ■ Spare Parts · Ersatzteile

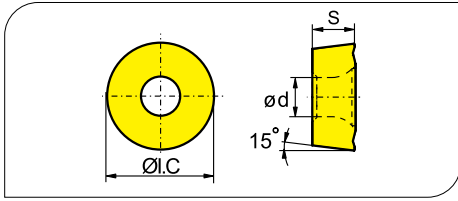
Type Typ	Screw Schraube	Wrench Schlüssel
FMR03**RD0702	I60M2,0 x 5,0	WT07P
FMR03**RD1003	I60M3,5 x 7,4	WT15P

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

# Milling · Fräsen

## Indexable Milling · Fräswendepplatten

### Applicable inserts · Wendeschneidplatten



Workpiece Material Werkstoff	Material Grade	Ideal Machining Condition Gute Bearbeitungsbedingungen			Normal Machining Condition Normale Bearbeitungsbedingungen			Unfavorable Machining Condition Ungünstige Bearbeitungsbedingungen		
		Blue	Light Blue	Yellow	Light Green	Yellow	Light Green	Red	Light Green	Red
<b>P</b>	Steel / Stahl	●	●	●	●	●	●	●	●	●
<b>M</b>	Stainless Steel / Rostfreier Stahl	●	●	●	●	●	●	●	●	●
<b>K</b>	Cast iron / Gusseisen	●	●	●	●	●	●	●	●	●
<b>N</b>	Non-ferrous material / Ne Metalle	●	●	●	●	●	●	●	●	●
<b>S</b>	Heat-resistant steel / Warmfester Stahl	●	●	●	●	●	●	●	●	●

Insert shape Plattenform	Type · Typ	Dimension (mm) Abmessung				CVD Coating CVD Beschicht.				PVD Coating PVD Beschicht.				Cermets		Carbide uncoat. unbe. Hartmetall								
		R	I.C	S	d	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201	
	<b>RDKW0702MO</b>	3.5	7.0	2.38	2.7			●				●	●											
	<b>RDKW0803MO</b>	4	8.0	3.18	3.4			●				●												
	<b>RDKW1003MO</b>	5	10.0	3.18	3.9			●	●			●	●											
	<b>RDKW10T3MO</b>	5	10.0	3.97	4.4	○		●				●	●											
	<b>RDKW1204MO</b>	6	12.0	4.76	4.4		○	●				●	●											
	<b>RDKW12T3MO</b>	6	12.0	3.97	3.9		○	●	●			●	●										○	
	<b>RDKW1604MO</b>	8	16.0	4.76	5.2			●				●	●											
	<b>RDKW1605MO</b>	8	16.0	5.56	5.5			●				●	●	○										
	<b>RDKW2006MO</b>	10	20.0	6.35	6.5			●		○														

### Recommended cutting data · Empfohlene Schnittdaten

Workpiece material Werkstückstoff	Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten	
			V (m/min)	f (mm/z)
<b>P</b> Low-carbon steel Soft steel Niedrig legierter Kohlenstoffstahl Baustahl	≤180	YBM251	270 (220-350)	0.2 (0.08-0.45)
		YBC301		
		YBM351	220 (180-300)	0.25 (0.15-0.45)
	YBG302			
	180-280	YBG202	270 (200-360)	0.2 (0.1-0.45)
		YBM251	240 (200-320)	0.2 (0.08-0.45)
		YBC301		
	YBM351	200 (160-280)	0.25 (0.15-0.45)	
	YBG302			
280-350	YBG202	240 (180-350)	0.2 (0.1-0.45)	
	YBM251	220 (180-300)	0.2 (0.08-0.45)	
	YBC301			
YBM351	180 (150-250)	0.25 (0.15-0.45)		
YBG302				
<b>M</b> Stainless steel Rostfreier Stahl	≤270	YBG202	220 (170-340)	0.2 (0.1-0.45)
		YBM251	150 (120-240)	0.2 (0.08-0.45)
		YBM351	150 (100-220)	0.25 (0.1-0.45)
<b>K</b> Cast iron Gusseisen	180-250	YBG202	160 (110-270)	0.2 (0.1-0.45)
		YBG302	210 (120-300)	0.2 (0.1-0.45)

Applicable tool [D14-D18](#)

Tools code key [B20-B21](#) Grade selection guide [B15-B19](#)

Technical data [B164-B170](#)

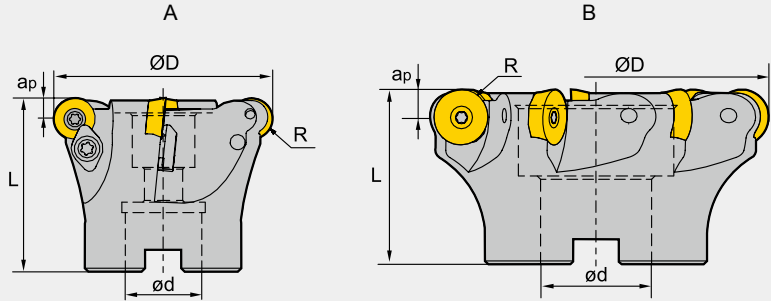
# Milling · Fräsen

Indexable Milling Tools · Wendeplattenfräser

## Face Milling Tools · Planfräser



**FMR04** P M K



### Specification of tools · Werkzeug Beschreibung

Type · Typ	Stock Lager	Dimension (mm) Abmessung					No. of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)
		Ø D	Ø D	L	R	apmax			
<b>FMR04</b>	050-A22-RD12-03	●	50	22	40	6	6	A	0.3
	063-A22-RD12-04	●	63	22	50	6	6	A	0.5
	080-B27-RD16-05	●	80	27	50	8	8	B	1.2
	100-B32-RD16-06	●	100	32	50	8	8	B	1.0
	125-B40-RD20-06	○	125	40	63	10	10	B	1.9
	160-B40-RD20-07	○	160	40	63	10	10	B	3.7

Inserts · WSP: RDKW1204MO\*\*/ RDKW1605MO\*\*/ RDKW2006MO

### Spare Parts · Ersatzteile

Diameter Durchmesser Ø D	Screw Schraube	Clamp Pratze	Clamp Screw Schraube (Pratze)	Wrench Schlüssel	
	Ø50-Ø63	I60M3.5×10	WD-204	I60M4×10	WT15IP
Ø80 -Ø100	I60M5×13	--	--	--	WT20IT
Ø125 -Ø160	I43M6×16	--	--	--	WT25IT

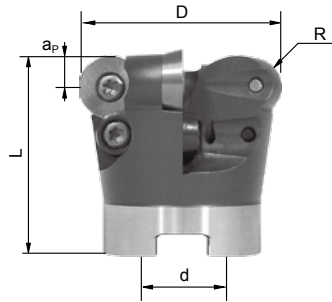


● Ex Stock / ab Lager ○ On demand / auf Anfrage

### Face Milling Tools · Planfräser



**FMR04** P M K



Type · Typ		Stock Lager	Dimension (mm) Abmessung					No. of teeth Zähne
			Ø D	Ø d	L	R	a <sub>pr</sub> max	
<b>FMR04</b>	042-A16-RD1003-06	●	42	16	44	5	5	6
	052-A22-RD1003-07	●	52	22	50	5	5	7

Inserts · WSP: RDKW1003MO\*\*

Type · Typ		Stock Lager	Dimension (mm) Abmessung					No. of teeth Zähne
			Ø D	Ø d	L	R	a <sub>pr</sub> max	
<b>FMR04</b>	042-A16-RD12T3-05	●	42	16	42	6	6	5
	052-A22-RD12T3-05	●	52	22	50	6	6	5
	066-A27-RD12T3-06	●	66	27	50	6	6	6
	080-A27-RD12T3-07	●	80	27	50	6	6	7

Inserts · WSP: RDKW12T3MO\*\*

Type · Typ		Stock Lager	Dimension (mm) Abmessung					No. of teeth Zähne
			Ø D	Ø d	L	R	a <sub>pr</sub> max	
<b>FMR04</b>	*052-A22-RD1604-04	●	52	22	50	8	8	4
	*052-A22-RD1604-05	●	52	22	50	8	8	5
	066-A27-RD1604-05	●	66	27	50	8	8	5
	080-A27-RD1604-06	●	80	27	52	8	8	6
	100-B32-RD1604-07	○	100	32	52	8	8	7
	125-B40-RD1604-08	○	125	40	52	8	8	8
	160-B40-RD1604-09	○	160	40	52	8	8	9

Inserts · WSP: RDKW1604MO\*\*

### ■ Spare Parts · Ersatzteile

\*= WX16N (außer für FMP04-052) (except for FMP04-052)

\*\*= nur ab (Ø 052) from (Ø 052)

Type Typ	Screw Schraube	Clamp Klemmscheibe	Clamp Screw Klemmschraube	Wrench Schlüssel
FMR04**RD1003	I60M3,5 x 7,4	-	-	WT15P
FMR04**RD12T3	I60M3,5 x 7,4	-	**LOM 3,5 x 7,1	WT15P
FMR04**RD1604	I60M4,5 x 9,8	*WX16N	-	WT20T

Applicable tool B9-B15  
Werkzeug

Tools code key B24-B25  
Werkzeug ISO

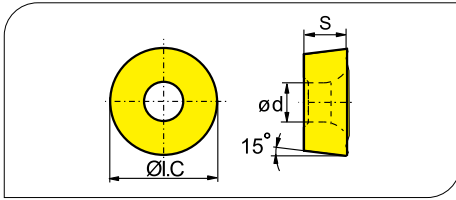
Grade selection guide B17-23  
Sortenauswahl

Technical data B182-B188  
Technische Daten

# Milling · Fräsen

## Indexable Milling · Fräswendeplatten

### Applicable inserts · Wendeschneidplatten



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

Workpiece Material / Werkstoffe	P	M	K	N	S
Steel / Stahl	●	●	●	●	●
Stainless Steel / Rostfreier Stahl	●	●	●	●	●
Cast iron / Gusseisen			●	●	●
Non-ferrous material / Ne Metalle				●	●
Heat-resistant steel / Warmfester Stahl				●	●

Insert shape Plattenform	Type · Typ	Dimension (mm) Abmessung				CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.					Cermets		Carbide uncoat. unbe. Hartmetall					
		R	I.C	S	d	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201	
	<b>RDKW0702MO</b>	3.5	7.0	2.38	2.7			●				●	●											
	<b>RDKW0803MO</b>	4	8.0	3.18	3.4			●				●												
	<b>RDKW1003MO</b>	5	10.0	3.18	3.9			●	●			●	●											
	<b>RDKW10T3MO</b>	5	10.0	3.97	4.4	○		●				●	●											
	<b>RDKW1204MO</b>	6	12.0	4.76	4.4		○	●				●	●											
	<b>RDKW12T3MO</b>	6	12.0	3.97	3.9		○	●	●			●	●										○	
	<b>RDKW1604MO</b>	8	16.0	4.76	5.2			●				●	●											
	<b>RDKW1605MO</b>	8	16.0	5.56	5.5			●				●	●	○										
	<b>RDKW2006MO</b>	10	20.0	6.35	6.5			●			○													

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



### Recommended cutting data · Empfohlene Schnittdaten

Workpiece material Werkstückstoff	Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten	
			V (m/min)	f (mm/z)
<b>P</b> Low-carbon steel Soft steel Niedrig legierter Kohlenstoffstahl Baustahl  High-carbon steel Alloy steel Hoch Leg. Kohlenstoffstahl  Alloy tool steel Leg. Werkzeugstahl	≤180	YBM251 YBC301	270 (220-350)	0.2 (0.08-0.45)
		YBM351 YBG302	220 (180-300)	0.25 (0.15-0.45)
		YBG202	270 (200-360)	0.2 (0.1-0.45)
	180-280	YBM251 YBC301	240 (200-320)	0.2 (0.08-0.45)
		YBM351 YBG302	200 (160-280)	0.25 (0.15-0.45)
		YBG202	240 (180-350)	0.2 (0.1-0.45)
	280-350	YBM251 YBC301	220 (180-300)	0.2 (0.08-0.45)
		YBM351 YBG302	180 (150-250)	0.25 (0.15-0.45)
		YBG202	220 (170-340)	0.2 (0.1-0.45)
<b>M</b> Stainless steel Rostfreier Stahl	≤270	YBM251	150 (120-240)	0.2 (0.08-0.45)
		YBM351 YBG302	150 (100-220)	0.25 (0.1-0.45)
		YBG202	160 (110-270)	0.2 (0.1-0.45)
<b>K</b> Cast iron Gusseisen	180-250	YBG302	210 (120-300)	0.2 (0.1-0.45)

# Milling · Fräsen

Indexable Milling Tools · Wendeplattenfräser

Case study for FMR04  
Bearbeitungsbeispiel für FMA04



- Tool · Werkzeug: FMR04-063-A22-RD12-04
- Inserts · WSP: RDKW1204MO/YBG202

Workpiece material  
Werkstückstoff: 42CrMo (HRC35)  
Cooling system  
Kühlsystem: dry cutting, trocken

Machine  
Maschine: vertical machining center

Cutting data  
Schnittdaten:  
 $V_c=200\text{m/min}$   
 $a_p=3\text{mm}$   
 $f_z=0.3\text{mm/z}$



- Wear comparison after 90 min.
- Verschleißvergleich nach 90 min.

ZCC-CT



A company

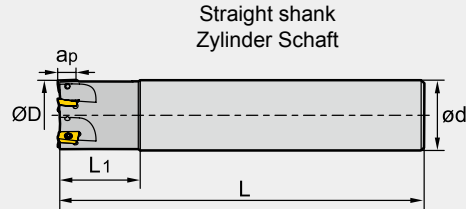


### Square shoulder milling tools · Eckfräser

**Kr:90°**






**EMP01** **P** **M** **K** **N**



### Specification of tools · Werkzeug Beschreibung

Type · Typ	Stock Lager	Dimensions (mm) · Abmessungen					No. of teeth Zähne	Weight Gewicht (kg)	
		$\varnothing D$	$\varnothing d$	L	L <sub>1</sub>	a <sub>pmax</sub>			
<b>EMP01</b>	012-G16-AP11-01	●	12	16	85	25	10.5	1	0.1
	016-G16-AP11-02	●	16	16	90	25	10.5	2	0.1
Straight shank	020-G20-AP11-02	●	20	20	100	30	10.5	2	0.2
	020-G20-AP11-03-M	●	20	20	100	30	10.5	3	0.2
Zylinder Schaft	025-G25-AP11-03	●	25	25	115	35	10.5	3	0.4
	025-G25-AP11-03C	●	25	25	115	35	10.5	3	0.4
	025-G25-AP11-04	●	25	25	115	35	10.5	4	0.4
	032-G32-AP11-04	●	32	32	125	40	10.5	4	0.7
	032-G32-AP11-04C	●	32	32	125	40	10.5	4	0.7
	025-G25-AP16-02	●	25	25	115	35	15.5	2	0.4
	025-G25-AP16-02C	●	25	25	115	35	15.5	2	0.4
	032-G32-AP16-03	●	32	32	125	40	15.5	3	0.7
	032-G32-AP16-03C	●	32	32	125	40	15.5	3	0.7
	040-G32-AP16-03	●	40	32	130	42	15.5	3	0.7
	040-G32-AP16-04	●	40	32	130	42	15.5	4	0.8
	040-G32-AP16-04C	○	40	32	130	42	15.5	4	0.8
	050-G32-AP16-05	●	50	32	135	45	15.5	5	1.0
	050-G32-AP16-05C	○	50	32	135	45	15.5	5	1.0
	063-G32-AP16-06	●	63	32	135	45	15.5	6	1.4
	063-G32-AP16-06C	○	63	32	135	45	15.5	6	1.4

### Spare Parts · Ersatzteile

Diameter Durchmesser $\varnothing D$	Insert WSP	Screw Schraube	Wrench Schlüssel	
				
$\varnothing 12$ - $\varnothing 32$	AP11	I60M2.5×6.5T	WT08IP	--
$\varnothing 25$ - $\varnothing 63$	AP16	I60M4×8.4	--	WT15IS



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

Applicable tool **B9-B15**  
Werkzeug

Tools code key **B24-B25**  
Werkzeug ISO

Grade selection guide **B15-B19**  
Sortenauswahl

Technical data **B293-B374**  
Technische Daten

# Milling · Fräsen

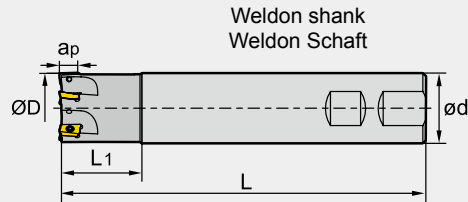
Indexable Milling Tools · Wendepplattenfräser

## Square shoulder milling tools · Eckfräser

Kr:90°






EMP01 P M K N



### Specification of tools · Werkzeug Beschreibung

Type · Typ	Stock Lager	Dimensions (mm) · Abmessungen					No. of teeth Zähne	Weight Gewicht (kg)
		Ø D	Ø D	L	L1	apmax		
<b>EMP01</b>	●	12	16	85	25	10.5	1	0.1
Weldon shank	●	16	16	90	25	10.5	2	0.1
	●	20	20	100	30	10.5	2	0.2
	●	20	20	100	30	10.5	3	0.2
Weldon Schaft	●	25	25	115	35	10.5	3	0.4
	●	25	25	115	35	10.5	4	0.4
	●	32	32	125	40	10.5	4	0.7
	●	25	25	115	35	15.5	2	0.4
	●	32	32	125	40	15.5	3	0.7
	●	40	32	130	42	15.5	4	0.8
	●	50	32	135	45	15.5	5	1.0
	○	63	32	135	45	15.5	6	1.4

### Spare Parts · Ersatzteile

Diameter Durchmesser Ø D	Insert WSP	Screw Schraube	Wrench Schlüssel	
				
Ø12-Ø32	AP11	I60M2.5×6.5T	WT08IP	--
Ø25-Ø63	AP16	I60M4×8.4	--	WT15IS

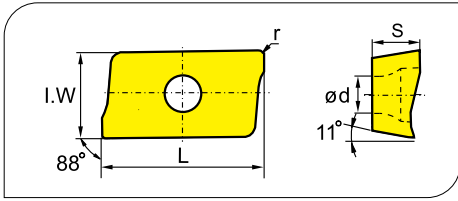


● Ex Stock / ab Lager ○ On demand / auf Anfrage

# Milling · Fräsen

## Indexable Milling Tools · Wendepplattenfräser

Applicable inserts · Wendeschneidplatten



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

Workpiece Material / Werkstoffe	P	M	K	N	S	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
<b>P</b> Steel / Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
<b>M</b> Stainless Steel / Rostfreier Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
<b>K</b> Cast iron / Gusseisen	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
<b>N</b> Non-ferrite material / Ne Metalle	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
<b>S</b> Heat-resistant steel / Warmfester Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Insert shape Plattenform	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating CVD Beschicht.					PVD Coating PVD Beschicht.					Cermets		Carbide uncoat. unbe. Hartmetall						
		L	I.W	S	d	r	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201	
	APKT11T304-PF	12.24	6.5	3.6	2.8	0.4	○	●	●				●	●											
	APKT11T308-PF	12.24	6.5	3.6	2.8	0.8		●					●												
	APKT11T312-PF	12.24	6.5	3.6	2.8	1.2								○											
	APKT11T316-PF	12.24	6.5	3.6	2.8	1.6								●											
	APKT160408-PF	17.877	9.33	5.76	4.4	0.8	●	●	●				●	●											
	APKT11T304-PM	12.24	6.5	3.6	2.8	0.4	●	●	●	●		●	●	●											
	APKT11T308-PM	12.24	6.5	3.6	2.8	0.8	●	●	●	●		●	●	●											
	APKT11T312-PM	12.24	6.5	3.6	2.8	1.2			●					●											
	APKT11T316-PM	12.24	6.5	3.6	2.8	1.6			●					●											
	APKT160408-PM	17.877	9.33	5.76	4.4	0.8	●	●	●	●	●	●	●	●	●	●	●	●							
	APKT11T304-PR	12.24	6.5	3.6	2.8	0.4		●		●					●										
	APKT11T304-LH	12.24	6.5	3.6	2.8	0.4																	●	●	
	APKT11T308-LH	12.24	6.5	3.6	2.8	0.8																	●	●	
	APKT160408-LH	17.877	9.33	5.76	4.4	0.8																	●	●	

Applicable tool **B9-B15**  
Werkzeug

Tools code key **B24-B25**  
Werkzeug ISO

Grade selection guide **B17-B23**  
Sortenauswahl

Technical data **B182-B188**  
Technische Daten

# Milling · Fräsen

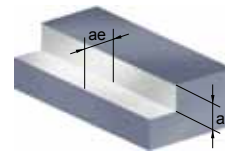
Indexable Milling Tools · Wendepplattenfräser

## Chipbreaker Selektion EMP01 · Spanbrecher Auswahl EMP01

Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	Roughing Schruppen
<b>P</b>	-PF	-PM	-PR
<b>M</b>	-PF	-PM	-PR
<b>K</b>	-PF	-PM	
<b>AL</b>	-LH		

### 1 Square shoulder milling

### 1 Eckfräsen

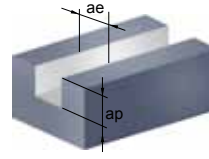


## Recommended cutting data · Empfohlene Schnittdaten

Workpiece material Werkstück Material	Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten					
			V(m/min)	f(mm/z)			ae(mm)	
				-PF	-PM	-PR		
<b>P</b>	Low-carbon steel Soft steel Niedrig legierter Kohlenstoffstahl Baustahl	YBM251 YBC301	320 (240-400)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D	
		YBM351	260 (180-380)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D	
		YBG202 YBG205	320 (200-400)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D	
		YBG302	280 (180-400)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D	
	High-carbon steel Alloy steel Hoch Leg. Kohlenstoffstahl Leg. Stahl	YBM251 YBC301	280 (210-380)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D	
		YBM351	240 (160-320)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D	
		YBG202 YBG205	280 (180-350)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D	
		YBG302	260 (150-380)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D	
	Alloy tool steel Leg. Werkzeugstahl	YBM251 YBC301	260 (180-350)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D	
		YBM351	220 (150-280)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D	
		YBG202 YBG205	260 (160-330)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D	
		YBG302	240 (120-350)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D	
<b>M</b>	Stainless steel Rostfreier Stahl	YBM251	200 (120-270)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D	
		YBM351	180 (150-300)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D	
		YBG202 YBG205	200 (110-300)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D	
		YBG302	170 (100-280)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D	
<b>K</b>	Cast iron Gusseisen	YBG102	220 (120-250)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	-	≤0.5D	
		YBD252	200 (120-320)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	-	≤0.5D	
<b>N</b>				-LH				
	Al alloy Al Leg.	---	YD101	300-	0.2 (0.08-0.4)			≤0.5D
			YD201	300-	0.2 (0.08-0.4)			≤0.5D

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

### 2 Slot milling 2 Nutenfräsen



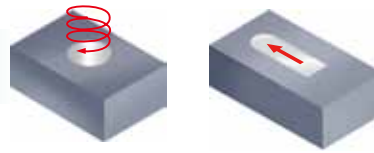
### Recommended cutting data · Empfohlene Schnittdaten

Workpiece material Werkstück Material	Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten					
			V(m/min)	f(mm/z)			ae(mm)	
				-PF	-PM	-PR		
<b>P</b> Low-carbon steel Soft steel Niedrig legierter Kohlenstoffstahl Baustahl	≤180	YBM251 YBC301	190 (170-250)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)	D	
		YBM351	150 (130-210)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)	D	
		YBG202 YBG205	190 (140-250)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)	D	
		YBG302	170 (130-250)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)	D	
	High-carbon steel Alloy steel Hoch Leg. Kohlenstoffstahl Leg. Stahl	180-280	YBM251 YBC301	170 (150-220)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)	D
			YBM351	140 (110-200)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)	D
			YBG202 YBG205	170 (130-250)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)	D
			YBG302	150 (110-230)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)	D
	Alloy tool steel Leg. Werkzeugstahl	280-350	YBM251 YBC301	150 (130-210)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)	D
			YBM351	130 (100-180)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)	D
			YBG202 YBG205	150 (110-240)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)	D
			YBG302	140 (80-210)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)	D
<b>M</b> Stainless steel Rostfreier Stahl	≤270	YBM251	110 (80-190)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)	D	
		YBM351	100 (80-170)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)	D	
		YBG202 YBG205	120 (80-190)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)	D	
		YBG302	100 (70-180)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)	D	
<b>K</b> Cast iron Gusseisen	180-250	YBG102	130 (80-180)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	-	D	
		YBD252	120 (80-210)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	-	D	
<b>N</b>	---			-LH				
		YD101	300-	0.2 (0.08-0.3)			D	
		YD201	300-	0.2 (0.08-0.3)			D	

# Milling · Fräsen

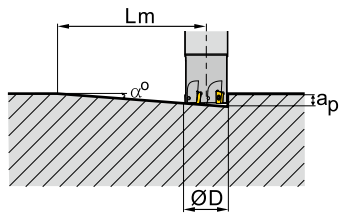
Indexable Milling Tools · Wendeplattenfräser

3 Ramp milling, helical interpolation milling  
3 Tauchfräsen, Spiral Interpolationsfräsen



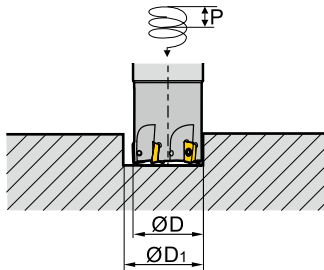
## Recommended cutting data · Empfohlene Schnittdaten

### Ramp milling Tauchfräsen



$$L_m = \frac{a_p}{\tan \alpha} \quad (\alpha: \text{Maximum ramp angle})$$

### Helical interpolation milling Spiral Interpolationsfräsen



$$\tan \alpha = \frac{P}{\pi D_1} \quad (\alpha: \text{helical angle})$$

Diameter Durchmesser Ø D (mm)	APKT Ramp milling, helical interpolation milling (Inserts—11) APKT Tauchfräsen, Spiral Interpolationsfräsen				
	Ramp milling Tauchfräsen			Helical interpolation milling Spiral Interpolationsfräsen	
	Max. cutting depth Schnitttiefe $a_p$ (mm)	Max. ramp angle $\alpha^\circ$	Min. length Länge $L_m$ (mm)	Min. diameter Durchmesser $\text{Ø } D_1$ (mm)	Max. pitch Steigung (mm)
16	10.0	10.0	56.7	20.0	2.0
20	10.0	5.0	114.4	28.0	2.0
25	10.0	4.5	127.0	40.0	2.0
32	10.0	3.0	190.8	56.0	2.0
40	10.0	2.0	286.4	70.0	2.0

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



### Case study for EMP01 Bearbeitungsbeispiel für EMP01

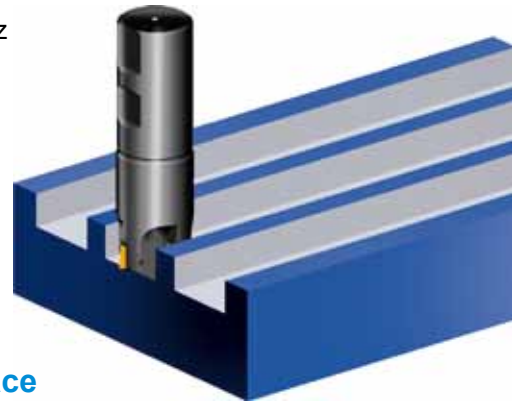


- Tool · Werkzeug: APKT160408-PM/YBC301
- Inserts · WSP: EMP01-040-XP32-AP16-04

Workpiece material  
Werkstück Material: Cast Steel (HB220)  
Cooling system  
Kühlsystem: dry cutting, trocken

Machine: vertical machining center  
Maschine: vertikales Maschinen Center

Cutting data  
Schnittdaten:  
Vc=180m/min  
ap=3mm  
fz=0.1mm/z



- Wear comparison of insert after milling curved face
- Verschleißvergleich der WSP

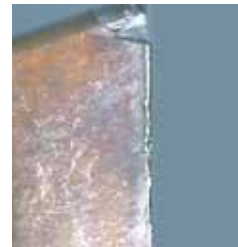
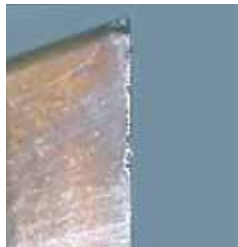
### ZCC-CT

### Other company product

15'



25'



# Milling · Fräsen

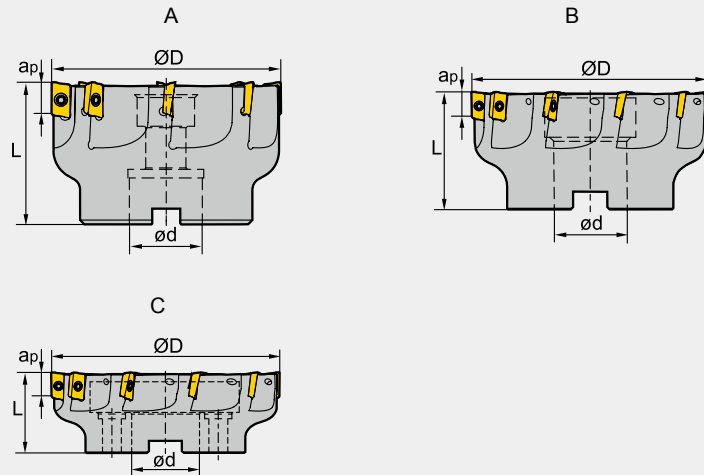
Indexable Milling Tools · Wendeplattenfräser

Square shoulder milling tools · Eckfräser

Kr:90°



EMPO2 P M K N



## Specification of tools · Werkzeug Beschreibung

Type · Typ	Stock Lager	Dimensions (mm) · Abmessungen				No. of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)
		Ø D	Ø D	L	apmax			
<b>EMPO2</b> 050-A22-AP11-06	●	50	22	40	11	6	A	0.3
050-A22-AP11-06C	○	50	22	40	11	6	A	
063-A22-AP11-08	●	63	22	40	11	8	A	0.6
063-A22-AP11-08C	○	63	22	40	11	8	A	
080-A27-AP11-08	●	80	27	50	11	8	A	1.2
080-A27-AP11-08C	○	80	27	50	11	8	A	
100-B32-AP11-10	●	100	32	50	11	10	B	1.7
050-A22-AP16-05	●	50	22	40	15.5	5	A	0.3
050-A22-AP16-05C	○	50	22	40	15.5	5	A	
063-A22-AP16-06	●	63	22	40	15.5	6	A	0.5
063-A22-AP16-06C	○	63	22	40	15.5	6	A	
080-A27-AP16-07	●	80	27	50	15.5	7	A	1.1
080-A27-AP16-07C	○	80	27	50	15.5	7	A	
100-B32-AP16-08	●	100	32	50	15.5	8	B	1.6
125-B40-AP16-10	●	125	40	63	15.5	10	B	3.2
160-B40-AP16-10	○	160	40	63	15.5	10	B	6.3
200-C60-AP16-12	○	200	60	63	15.5	12	C	8.1
250-C60-AP16-12	○	250	60	63	15.5	12	C	11.2

## Spare Parts · Ersatzteile

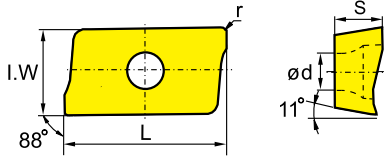
Diameter Durchmesser Ø D	Insert WSP	Screw Schraube	Wrench Schlüssel	
Ø50-Ø250	AP11	I60M2.5×6.5T	WT08IS	
Ø50-Ø250	AP16	I60M4×10	WT15IS	

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

# Milling · Fräsen

## Indexable Milling Tools · Wendepplattenfräser

■ Applicable inserts · Wendeschneidplatten



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

Workpiece Material / Werkstoffe	P	M	K	N	S	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
<b>P</b> Steel / Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
<b>M</b> Stainless Steel / Rostfreier Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
<b>K</b> Cast iron / Gusseisen	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
<b>N</b> Non-ferrite material / Ne Metalle	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
<b>S</b> Heat-resistant steel / Warmfester Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Insert shape Plattenform	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating CVD Beschicht.					PVD Coating PVD Beschicht.					Cermet		Carbide uncoat. unbe. Hartmetall						
		L	I.W	S	d	r	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201	
	APKT11T304-PF	12.24	6.5	3.6	2.8	0.4	○	●	●				●	●											
	APKT11T308-PF	12.24	6.5	3.6	2.8	0.8		●					●												
	APKT11T312-PF	12.24	6.5	3.6	2.8	1.2								○											
	APKT11T316-PF	12.24	6.5	3.6	2.8	1.6								●											
	APKT160408-PF	17.877	9.33	5.76	4.4	0.8	●	●	●				●	●											
	APKT11T304-PM	12.24	6.5	3.6	2.8	0.4	●	●	●	●		●	●	●											
	APKT11T308-PM	12.24	6.5	3.6	2.8	0.8	●	●	●	●		●	●	●											
	APKT11T312-PM	12.24	6.5	3.6	2.8	1.2			●					●											
	APKT11T316-PM	12.24	6.5	3.6	2.8	1.6			●					●											
	APKT160408-PM	17.877	9.33	5.76	4.4	0.8	●	●	●	●	●	●	●	●	●	●									
	APKT11T304-PR	12.24	6.5	3.6	2.8	0.4		●		●						●									
	APKT11T304-LH	12.24	6.5	3.6	2.8	0.4																	●	●	
	APKT11T308-LH	12.24	6.5	3.6	2.8	0.8																	●	●	
	APKT160408-LH	17.877	9.33	5.76	4.4	0.8																	●	●	

Applicable tool **B9-B15**  
Werkzeug

Tools code key **B24-B25**  
Werkzeug ISO

Grade selection guide **B17-B23**  
Sortenauswahl

Technical data **B182-B188**  
Technische Daten

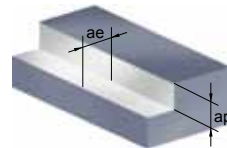
# Milling · Fräsen

Indexable Milling Tools · Wendepplattenfräser

## Chipbreaker Selektion · Spanbrecher Auswahl

Application Anwendung	Finishing Schlichten	Semi-Finishing Mittlere Bearbeitung	Roughing Schruppen
<b>P</b>	-PF	-PM	-PR
<b>M</b>	-PF	-PM	-PR
<b>K</b>	-PF	-PM	
<b>AL</b>	-LH		

## Square shoulder milling Eckfräsen



## Recommended cutting data · Empfohlene Schnittdaten

Workpiece material Werkstück Material	Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten					
			V(m/min)	f(mm/z)			ae(mm)	
				-PF	-PM	-PR		
<b>P</b> Low-carbon steel Soft steel Niedrig legierter Kohlenstoffstahl Baustahl	≤180	YBM251 YBC301	320 (240-400)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D	
		YBM351	260 (180-380)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D	
		YBG202 YBG205	320 (200-400)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D	
		YBG302	280 (180-400)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D	
	High-carbon steel Alloy steel Hoch Leg. Kohlenstoffstahl Leg. Stahl	180-280	YBM251 YBC301	280 (210-380)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D
			YBM351	240 (160-320)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D
			YBG202 YBG205	280 (180-350)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D
			YBG302	260 (150-380)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D
	Alloy tool steel Leg. Werkzeugstahl	280-350	YBM251 YBC301	260 (180-350)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D
			YBM351	220 (150-280)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D
			YBG202	260 (160-330)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D
			YBG302	240 (120-350)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D
<b>M</b> Stainless steel Rostfreier Stahl	≤270	YBM251	200 (120-270)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D	
		YBM351	180 (150-300)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D	
		YBG202	200 (110-300)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D	
		YBG302	170 (100-280)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D	
<b>K</b> Cast iron Gusseisen	180-250	YBG102	220 (120-250)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	-	≤0.5D	
		YBD252	200 (120-320)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	-	≤0.5D	
<b>N</b> Al alloy Al Leg.	----	YD101	300-	-LH			≤0.5D	
		YD201	300-	0.2 (0.08-0.4)			≤0.5D	

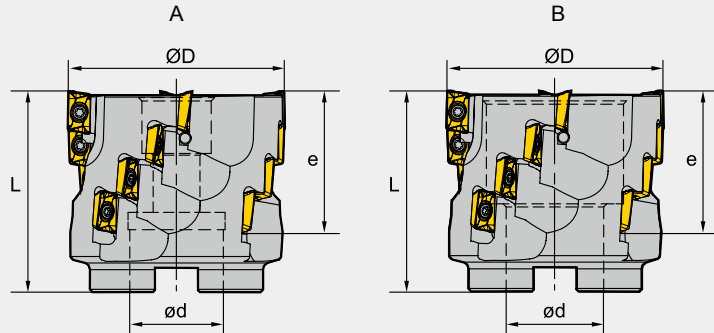
● Ex Stock / ab Lager ○ On demand / auf Anfrage

### Square shoulder milling tools · Eckfräser

Kr:90°






EMPO3 P M K N



### Specification of tools · Werkzeug Beschreibung

Type · Typ	Stock Lager	Dimensions (mm) · Abmessungen				Flute number z	No. of inserts WSP Anzahl	Coupling Aufnahme	Weight Gewicht (kg)
		Ø D	Ø D	L	e				
<b>EMPO3</b> -050-A22-AP11-04	●	50	22	58	39	4	16	A	0.5
-063-A27-AP11-04	●	63	27	58	39	4	16	A	0.9
-080-B32-AP11-05	●	80	32	63	39	5	20	B	1.3
-100-B40-AP11-06	●	100	40	63	39	6	24	B	2.0

### Spare Parts · Ersatzteile

Diameter Durchmesser Ø D	Screw Schraube	Wrench Schlüssel	
Ø50-Ø100	 I60M2.5×6.5T	 WT08IS	

Applicable tool **B9-B15**  
Werkzeug

Tools code key **B24-B25**  
Werkzeug ISO

Grade selection guide **B15-B19**  
Sortenauswahl

Technical data **B293-B374**  
Technische Daten

# Milling · Fräsen

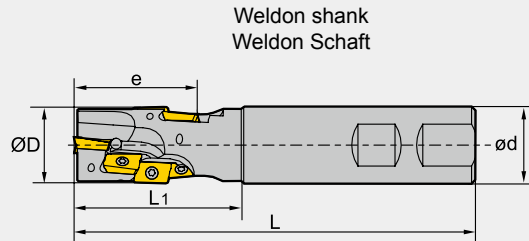
Indexable Milling Tools · Wendeplattenfräser

Square shoulder milling tools · Eckfräser

Kr:90°





EMP04 **P** **M** **K** **N**



## Specification of tools · Werkzeug Beschreibung

Type · Typ	Stock Lager	Dimensions (mm) · Abmessungen					Flute number	No. of inserts WSP Anzahl	Weight Gewicht (kg)
		Ø D	Ø D	L	L1	e			
<b>EMP04</b> -020-XP20-AP11-01	●	20	20	120	45	29.4	1	3	0.3
-025-XP25-AP11-02	●	25	25	130	55	38.9	2	8	0.4
-032-XP32-AP11-02	●	32	32	140	65	48.5	2	10	0.7
-040-XP40-AP11-02	●	40	40	150	75	58.0	2	14	1.3

## Spare Parts · Ersatzteile

Diameter Durchmesser Ø D	Screw Schraube	Wrench Schlüssel
Ø20-Ø40	 I60M2.5×6.5T	 WT08IS



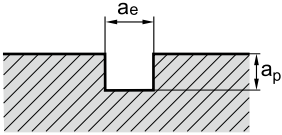
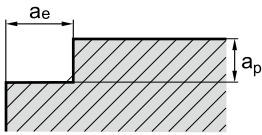
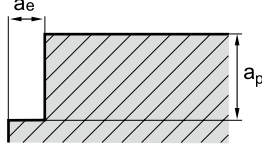
● Ex Stock / ab Lager ○ On demand / auf Anfrage



# Milling · Fräsen

## Indexable Milling Tools · Wendeplattenfräser

### Recommended cutting data · Empfohlene Schnittdaten

Slot milling · Nutenfräsen	Square shoulder milling Eckfräsen	Deep square shoulder milling Tiefes Eckfräsen
		
ae=D ap:≤0.5D	ae:≤0.5D ap:≤1.2D	ae:≤0.2D ap<Cutting length of insert Schneidkantenlänge

Workpiece material Werkstück Material	Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten			
			Square shoulder milling · Eckfräsen			
			V(m/min)	f(mm/z)		
-PF	-PM	-PR				
<b>P</b> Low-carbon steel Soft steel Niedrig legierter Kohlenstoffstahl Baustahl	≤180	YBM251	270 (240-350)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)
		YBC301				
		YBM351	220 (180-300)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)
		YBG202 YBG205	270 (200-360)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)
	180-280	YBM251	240 (210-320)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)
		YBC301				
		YBM351	200 (160-280)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)
		YBG202 YBG205	240 (180-360)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)
	280-350	YBM251	220 (180-300)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)
		YBC301				
		YBM351	180 (150-250)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)
		YBG202 YBG205	220 (160-340)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)
<b>M</b> Alloy tool steel Leg. Werkzeugstahl	280-350	YBG302	200 (120-300)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)
		YBM251	170 (120-240)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)
		YBM351	160 (150-270)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)
		YBG202 YBG205	150 (110-270)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)
<b>K</b> Cast iron Gusseisen	180-250	YBG302	140 (100-250)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)
		YBG102	200 (120-240)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	
		YBD252	180 (120-300)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	
<b>N</b> Al alloy Al Leg.	----	YD101	300-	-LH 0.2 (0.08-0.4)		
		YD201	300-	0.2 (0.08-0.4)		

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



### Recommended cutting data · Empfohlene Schnittdaten

Workpiece material Werkstück Material	Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten				
			Slot milling, deep square shoulder milling Nutenfräsen, Eckfräsen				
			V(m/min)	f(mm/z)			
-PF	-PM	-PR					
<b>P</b> Low-carbon steel Soft steel Niedrig legierter Kohlenstoffstahl Baustahl	≤180	YBM251 YBC301	270 (240-350)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)	
		YBM351	220 (180-300)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)	
		YBG202 YBG205	270 (200-360)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)	
		YBG302	240 (180-350)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)	
	High-carbon steel Alloy steel Hoch Leg. Kohlenstoffstahl Leg. Stahl	180-280	YBM251 YBC301	240 (210-320)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)
			YBM351	200 (160-280)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)
			YBG202 YBG205	240 (180-360)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)
			YBG302	220 (150-330)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)
	Alloy tool steel Leg. Werkzeugstahl	280-350	YBM251 YBC301	220 (180-300)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)
			YBM351	180 (150-250)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)
			YBG202 YBG205	220 (160-340)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)
			YBG302	200 (120-300)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)
<b>M</b> Stainless steel Rostfreier Stahl	≤270	YBM251	170 (120-240)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)	
		YBM351	160 (150-270)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)	
		YBG202 YBG205	150 (110-270)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)	
		YBG302	140 (100-250)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2 (0.2-0.3)	
<b>K</b> Cast iron Gusseisen	180-250	YBG102	200 (120-240)	0.1 (0.08-0.15)	0.15 (0.1-0.25)		
		YBD252	180 (120-300)	0.1 (0.08-0.15)	0.15 (0.1-0.25)		
<b>N</b>	----			-LH			
		Al alloy Al Leg.		YD101	300-	0.2 (0.08-0.3)	
				YD201	300-	0.2 (0.08-0.3)	

# Milling · Fräsen

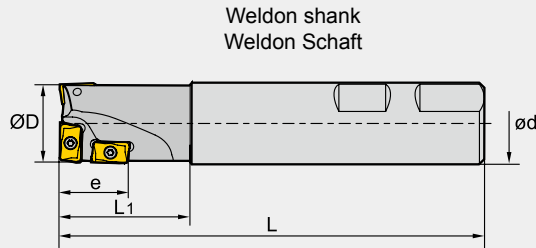
Indexable Milling Tools · Wendeplattenfräser

## Square shoulder milling tools · Eckfräser

Kr:90°



**EMP05** P M K



### ■ Specification of tools · Werkzeug Beschreibung

Type · Typ		Stock Lager	Dimensions (mm) · Abmessungen					No. of inserts WSP Anzahl		Weight Gewicht (kg)
			R	Ø D	Ø D	L	L <sub>1</sub>	e	APMT11	
<b>EMP05</b>	-025-XP25	●	25	25	130	40	20	3	--	0.5
	-032-XP32	●	32	32	140	50	30	--	3	0.8
	-040-XP32	●	40	32	150	60	40	--	4	1.0

### ■ Spare Parts · Ersatzteile

Diameter Durchmesser Ø D	Insert WSP	Screw Schraube	Wrench Schlüssel	
Ø25-Ø40	APMT11	I60M2.5×6.5T	WT08IP	
	APMT16	I60M4×10	WT15IP	

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



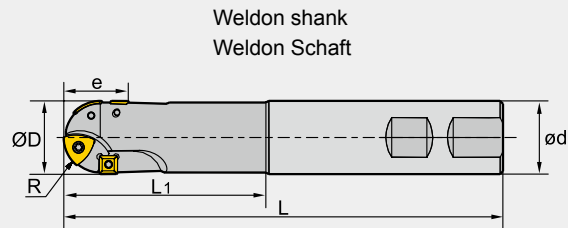
# Milling · Fräsen

Indexable Milling Tools · Wendepplattenfräser

## Profil milling tools · Profilfräser






**BMR01** P M K



### Specification of tools · Werkzeug Beschreibung

Type · Typ	Stock Lager	Dimensions (mm) · Abmessungen							Inserts · WSP				Weight Gewicht (kg)
		R	Ø D	e	ø d	L	L <sub>1</sub>	Type · Typ	Quantity Anzahl	Type · Typ	Quantity Anzahl		
<b>BMR01</b>	-020-XP20-S	○	10	20	20	20	125	50	ZDET08T2CYR10	2	SPMT060304	2	0.3
	-020-XP20-M	○	10	20	20	20	150	75	ZDET08T2CYR10	2	SPMT060304	2	0.3
	-020-XP20-L	○	10	20	20	20	200	100	ZDET08T2CYR10	2	SPMT060304	2	0.4
	-025-XP25-S	○	12.5	25	23	25	150	70	ZDET1103CYR12.5	2	SPMT060304	2	0.5
	-025-XP25-M	○	12.5	25	23	25	175	95	ZDET1103CYR12.5	2	SPMT060304	2	0.6
	-025-XP25-L	○	12.5	25	23	25	200	100	ZDET1103CYR12.5	2	SPMT060304	2	0.7
	-032-XP32-S	○	16	32	31	32	175	85	ZDET13T3CYR16	2	SDMT090308	2	0.9
	-032-XP32-M	○	16	32	31	32	200	100	ZDET13T3CYR16	2	SDMT090308	2	1.1
	-032-XP32-L	○	16	32	31	32	250	150	ZDET13T3CYR16	2	SDMT090308	2	1.4
	-040-XP40-S	○	20	40	41	40	175	85	ZPNT2204CY(R20)	3	SPMT120408	2	1.4
	-040-XP40-M	○	20	40	41	40	200	100	ZPNT2204CY(R20)	3	SPMT120408	2	1.7
	-040-XP40-L	○	20	40	41	40	250	150	ZPNT2204CY(R20)	3	SPMT120408	2	2.1
	-050-XP40-S	○	25	50	45	40	200	100	ZPNT2204CY(R25)	3	SPMT120408	2	1.8
	-050-XP40-M	○	25	50	45	40	300	100	ZPNT2204CY(R25)	3	SPMT120408	2	2.8
	-063-XP40-S	○	31.5	63	52	40	200	100	ZPNT2204CY(R31)	4	SPMT120408	2	3.0
	-063-XP40-M	○	31.5	63	52	40	300	100	ZPNT2204CY(R31)	4	SPMT120408	2	3.5

### Spare parts · Ersatzteile

Diameter Durchmesser Ø D	Screw Schraube	Wrench Schlüssel	
			
Ø20-Ø25	I43M2.5×5.7	WT07IP	--
Ø32	I43M4×8	--	WT15IS
Ø40-Ø63	I43M5×11	--	WT20IS

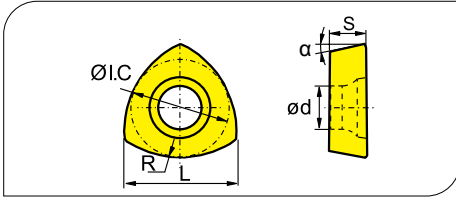


● Ex Stock / ab Lager ○ On demand / auf Anfrage

# Milling - Fräsen

## Indexable Milling Tools - Wendepplattenfräser

### Applicable inserts · Wendeschneidplatten

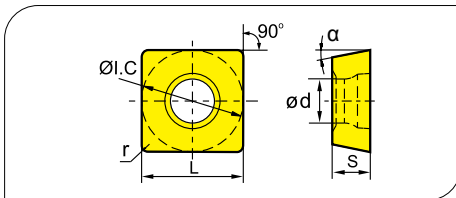


- Ideal Machining Condition / Gute Bearbeitungsbedingungen
- Normal Machining Condition / Normale Bearbeitungsbedingungen
- Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen

Workpiece Material / Werkstoffe	P	M	K	N	S	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
P Steel / Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
M Stainless Steel / Rostfreier Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
K Cast iron / Gusseisen	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
N Non-ferrous material / Ne Metalle	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
S Heat-resistant steel / Warmfester Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen						CVD Coating / CVD Beschicht.				PVD Coating / PVD Beschicht.				Cermet		Carbide uncoat. unbe. Hartmetall							
		R	L	I.C.	S	d	α	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	ZDET08T2CYR10	10	8.4	6.75	2.78	2.8	14°		●																
	ZDET1103CYR12.5	12.5	10.6	8.5	3.18	2.8	14°		●																
	ZDET13T3CYR16	16	13.2	10.5	3.97	4.4	14°		○																
	ZPNT2204CY(R20)	20	16.1	12.7	4.76	5.56	11°		○																
	ZPNT2204CY(R25)	25	16.9	12.7	4.76	5.56	11°		○																
	ZPNT2204CY(R31)	31.5	17.6	12.7	4.76	5.56	11°		○																

### Applicable inserts · Wendeschneidplatten



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

Workpiece Material / Werkstoffe	P	M	K	N	S	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
P Steel / Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
M Stainless Steel / Rostfreier Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
K Cast iron / Gusseisen	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
N Non-ferrous material / Ne Metalle	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
S Heat-resistant steel / Warmfester Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen						CVD Coating / CVD Beschicht.				PVD Coating / PVD Beschicht.				Cermet		Carbide uncoat. unbe. Hartmetall							
		r	L	I.C.	S	d	α	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SPMT060304	0.4	6.35	6.35	3.18	2.8	11°		●																
	SDMT090308	0.8	9.525	9.525	3.18	4.4	15°		●																
	SPMT120408	0.8	12.7	12.70	4.76	5.5	11°	●	●																

Applicable tool B9-B15  
Werkzeug

Tools code key B24-B25  
Werkzeug ISO

Grade selection guide B17-23  
Sortenauswahl

Technical data B182-B188  
Technische Daten

# Milling · Fräsen

Indexable Milling Tools · Wendeplattenfräser

## Recommended Cutting data · Schnittdaten

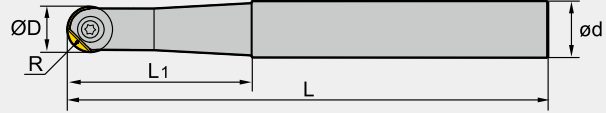
Workpiece material Werkstück- stoff	Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten	
			V(m/min)	f(mm/z)
<b>P</b> Low-carbon steel Soft steel Niedrig legierter Kohlenstoffstahl Baustahl High-carbon steel Alloy steel Hoch Leg. Kohlenstoffstahl Leg. Stahl Alloy tool steel Leg. Werkzeugstahl	≤180	YBM251	180(120-220)	0.25(0.1-0.4)
		YBG302	160(120-220)	0.25(0.1-0.4)
	180-280	YBM251	150(100-200)	0.2(0.1-0.4)
		YBG302	120(100-200)	0.2(0.1-0.4)
	280-350	YBM251	100(80-150)	0.2(0.1-0.3)
		YBG302	100(80-150)	0.2(0.1-0.3)
<b>M</b> Stainless steel Rostfreier Stahl	≤270	YBM251	100(80-150)	0.2(0.1-0.3)
		YBG302	100(80-150)	0.2(0.1-0.3)
<b>K</b> Cast iron Gusseisen	180-250	YBG302	150(100-180)	0.3(0.2-0.5)

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

### Profil milling tools · Profilfräser



**BMR02** P M K



### Specification of tools · Werkzeug Beschreibung

Type · Typ	Stock Lager	Dimensions (mm) · Abmessungen					Weight Gewicht (kg)	
		R	Ø D	ø d	L	L <sub>1</sub>		
<b>BMR02</b>	-012-G16-S	●	6	12	16	110	40	0.1
	-012-G16-M	●	6	12	16	130	50	0.2
	-012-G16-L	●	6	12	16	160	50	0.2
	-016-G20-S	●	8	16	20	140	45	0.3
	-016-G20-M	●	8	16	20	170	65	0.3
	-016-G20-L	●	8	16	20	200	65	0.4
	-020-G25-S	●	10	20	25	160	60	0.5
	-020-G25-M	●	10	20	25	200	80	0.6
	-020-G25-L	●	10	20	25	240	80	0.8

### Spare parts · Ersatzteile

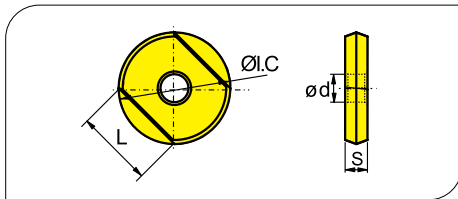
Diameter Durchmesser Ø D	Screw Schraube	Wrench Schlüssel
Ø12	I90M4×09TT	WT10S
Ø16	I90M5×11TT	WT15S
Ø20	I90M5×13.5TT	WT15S



# Milling - Fräsen

## Indexable Milling Tools - Wendeplattenfräser

### Applicable inserts - Wendschneidplatten



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

Workpiece Material / Werkstoffe	P	M	K	N	S	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
<b>P</b> Steel / Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
<b>M</b> Stainless Steel / Rostfreier Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
<b>K</b> Cast iron / Gusseisen	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
<b>N</b> Non-ferrous material / Ne Metalle	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
<b>S</b> Heat-resistant steel / Warmfester Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen				CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.				Cermet		Carbide uncoat. unbe. Hartmetall						
		I.C	L	S	d	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201	
	<b>ROHX1203</b>	12	8.5	3	4				●			○	○			○								
	<b>ROHX1604</b>	16	11.3	4	5				●				●				○							
	<b>ROHX2005</b>	20	14.1	5	5				●					●			○							

### Recommended Cutting data - Schnittdaten

Workpiece material / Werkstückstoff	Hardness HB / Härte	Grade / Sorte	Cutting data · Schnittdaten	Diameter · Durchmesser Ø D		
				Ø12	Ø16	Ø20
<b>P</b> carbon steel leg. Kohlenstoffstahl	HB≤180	YBG202 YBG252 YBM351	V(m/min)	100~200	100~200	100~200
			f <sub>z</sub> (mm/z)	0.15~0.25	0.2~0.3	0.2~0.3
			a <sub>pmax</sub> (mm)	0.8	1	1.25
			a <sub>emax</sub> (mm)	0.8	1	1.25
			V(m/min)	80~180	80~180	80~180
			f <sub>z</sub> (mm/z)	0.15~0.25	0.2~0.3	0.2~0.3
	a <sub>pmax</sub> (mm)		0.8	1	1.25	
	a <sub>emax</sub> (mm)		0.8	1	1.25	
	V(m/min)		60~100	60~100	60~100	
	f <sub>z</sub> (mm/z)		0.15~0.25	0.2~0.3	0.2~0.3	
	a <sub>pmax</sub> (mm)		0.4	0.5	0.6	
	a <sub>emax</sub> (mm)		0.4	0.5	0.6	
<b>M</b> Stainless steel Rostfreier Stahl	HB≤270	V(m/min)	70~150	70~150	70~150	
		f <sub>z</sub> (mm/z)	0.1~0.2	0.1~0.25	0.1~0.25	
		a <sub>pmax</sub> (mm)	0.6	0.8	1	
		a <sub>emax</sub> (mm)	0.6	0.8	1	
		V(m/min)	160~300	160~300	160~300	
		f <sub>z</sub> (mm/z)	0.2~0.3	0.25~0.35	0.25~0.35	
<b>K</b> Cast iron Gusseisen	HB180-250	a <sub>pmax</sub> (mm)	1	1.5	1.8	
		a <sub>emax</sub> (mm)	1	1.5	1.8	

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

Milling Tools - Fräser





### Profil milling tools · Profilfräser

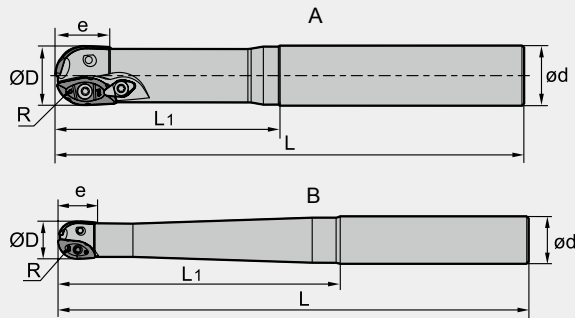
**BMR03** P M K

A (Ø30-Ø40)



B (Ø16-Ø25)

Straight shank  
Zylinder Schaft

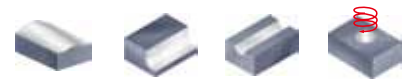


### Specification of tools · Werkzeug Beschreibung

Type · Typ	Stock Lager	Dimensions (mm) · Abmessungen						No. of teeth Zähne	Weight Gewicht (kg)	Type · Typ	Clamp Pratze	
		R	Ø D	ø d	L	L <sub>1</sub>	e					
<b>BMR03</b>	-016-G20-S	●	8	16	20	150	70	16	2	0.3	B	WD-208
	-016-G20-M	●	8	16	20	180	80	16	2	0.4	B	
	-020-G25-S	●	10	20	25	180	80	20	2	0.5	B	
	-020-G25-M	●	10	20	25	200	100	20	2	0.6	B	
	-020-G25-L	●	10	20	25	250	150	20	2	0.7	B	
	-020-G25-XL	○	10	20	25	300	110	20	2	1.0	B	
	-025-G25-S	●	12.5	25	25	180	80	25	2	0.6	B	
	-025-G25-M	●	12.5	25	25	200	100	25	2	0.7	B	
	-025-G25-L	○	12.5	25	25	250	110	25	2	0.8	B	
	-025-G25-XL	○	12.5	25	25	300	120	25	2	1.0	B	
<b>BMR03</b>	-030-G32-S	●	15	30	32	200	120	30	2	1.0	A	WD-208
	-030-G32-M	●	15	30	32	250	150	30	2	1.3	A	
	-030-G32-L	●	15	30	32	300	200	30	2	1.6	A	
	-030-G32-XL	○	15	30	32	350	200	30	2	1.9	A	
	-032-G32-S	●	16	32	32	200	120	32	2	1.1	A	
	-032-G32-M	●	16	32	32	250	150	32	2	1.4	A	
	-032-G32-L	●	16	32	32	300	200	32	2	1.6	A	
	-032-G32-XL	○	16	32	32	350	200	32	2	2.0	A	
<b>BMR03</b>	-040-G40-S	○	20	40	40	200	120	40	2	1.6	A	CBH5R1
	-040-G40-M	○	20	40	40	250	150	40	2	2.0	A	
	-040-G40-L	●	20	40	40	300	200	40	2	2.5	A	
	-040-G40-XL	○	20	40	40	350	200	40	2	3.0	A	

# Milling · Fräsen

Indexable Milling Tools · Wendeplattenfräser



## Profil milling tools · Profilfräser

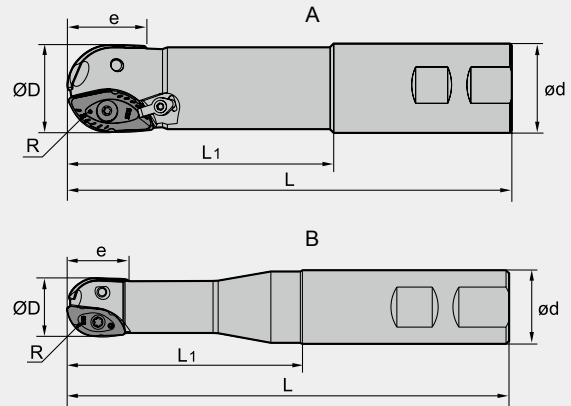
**BMR03** P M K

A (Ø30-Ø50)



B (Ø16-Ø25)

Weldon shank  
Weldon Schaft



### Specification of tools · Werkzeug Beschreibung

Type · Typ	Stock Lager	Dimensions (mm) · Abmessungen							No. of teeth Zähne	Weight Gewicht (kg)	Type · Typ	Clamp Prätze
		R	Ø D	ø d	L	L <sub>1</sub>	e					
<b>BMR03</b> -016-XP20-M	●	8	16	20	111	60	16	2	0.2	B	WD-208	
-020-XP25-M	●	10	20	25	127	70	20	2	0.3	B		
-020-XP25-L	●	10	20	25	150	80	20	2	0.4	B		
-025-XP25-M	●	12.5	25	25	137	80	25	2	0.4	B		
-025-XP25-L	●	12.5	25	25	200	100	25	2	0.6	B		
-030-XP32-M	●	15	30	32	161	100	30	2	0.8	A		
-030-XP32-L	●	15	30	32	250	150	30	2	1.3	A		
-032-XP32-M	●	16	32	32	161	100	32	2	0.8	A		
-032-XP32-L	●	16	32	32	250	120	32	2	1.3	A		
-040-XP40-M	○	20	40	40	175	100	40	2	1.3	A		CBH5R1
-040-XP40-L	●	20	40	40	250	120	40	2	2.0	A		
-050-XP50-M	○	25	50	50	200	100	50	2	2.5	A		
-050-XP50-L	○	25	50	50	250	150	50	2	3.1	A		

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



### Profil milling tools · Profilfräser

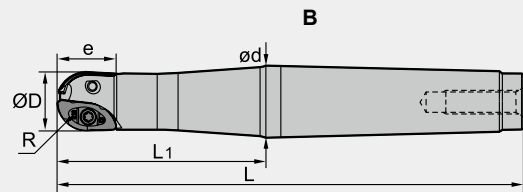
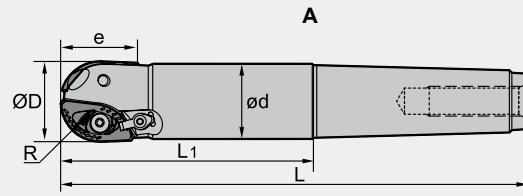
**BMR03** P M K

A (Ø30-Ø50)



B (Ø20-Ø25)

Morse taper shank  
Morsekegel Schaft



### ■ Specification of tools · Werkzeug Beschreibung

Type · Typ	Stock Lager	Dimensions (mm) · Abmessungen						No. of teeth Zähne	Weight Gewicht (kg)	type	Clamp Pratte	
		R	Ø D	Ø d	L	L1	e					
<b>BMR03</b>	-020-MT3-M	○	10	20	18.7	156	70	20	2	0.4	B	WD-208
	-020-MT3-L	○	10	20	18.7	186	100	20	2	0.4	B	
	-025-MT3-M	○	12.5	25	23.5	156	70	25	2	0.4	B	
	-025-MT3-L	○	12.5	25	23.5	186	100	25	2	0.4	B	
	-030-MT4-M	●	15	30	28.2	189	70	30	2	0.8	A	
	-030-MT4-L	○	15	30	28.2	229	120	30	2	1.0	A	
	-032-MT4-M	○	16	32	29.2	179	70	32	2	0.9	A	
	-032-MT4-L	●	16	32	29.2	209	100	32	2	0.9	A	
	-040-MT4-M	○	20	40	36.9	199	100	40	2	1.0	A	CBH5R1
	-040-MT5-L	●	20	40	36.9	226	90	40	2	1.8	A	
	-040-MT5-XL	○	20	40	36.9	256	120	40	2	2.0	A	
	-050-MT5-M	●	25	50	46.8	236	100	50	2	2.2	A	
-050-MT5-L	●	25	50	46.8	286	150	50	2	2.9	A		

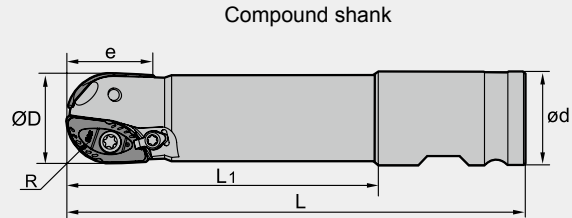
# Milling · Fräsen

Indexable Milling Tools · Wendepplattenfräser



## Profil milling tools · Profilfräser

**BMR03** P M K



### Specification of tools · Werkzeug Beschreibung

Type · Typ	Stock Lager	Dimensions (mm) · Abmessungen							No. of teeth Zähne	Weight Gewicht (kg)	Clamp Prätze
		R	Ø D	ø d	L	L <sub>1</sub>	e				
<b>BMR03</b>	-040-XPX-M	○	20	40	50.8	250	170	40	2	1.3	CBH5R1
	-040-XPX-L	○	20	40	50.8	300	220	40	2	3.1	
	-040-XPX-XL	○	20	40	50.8	350	270	40	2	3.5	
	-050-XPX-M	○	25	50	50.8	250	170	50	2	3.1	
	-050-XPX-L	○	25	50	50.8	300	200	50	2	3.8	
	-050-XPX-XL	○	25	50	50.8	350	270	50	2	4.4	

### Spare parts · Ersatzteile

Diameter Durchmesser Ø D	Clamp Prätze	Screw Schraube	Wrench Schlüssel	
Φ16	--	I60M2.5×6.5	--	WT07P
Φ20	--	I60M3.5×08TT		WT10IP
Φ25	--	I60M4×10		WT15S
Φ30	WD-208	I60M5×13	WT20IT	--
Φ32	WD-208	I60M5×13		
Φ40	CBH5R1	I43M6×16	WT25IT	--
Φ50	CBH5R1	I43M8×21	WT25IT	
		I43M6×16	WT30IT	

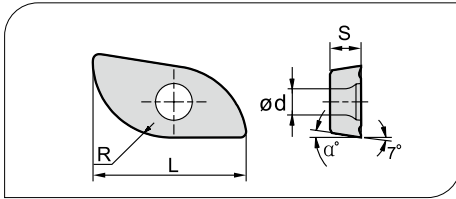


● Ex Stock / ab Lager ○ On demand / auf Anfrage

# Milling · Fräsen

## Indexable Milling Tools · Wendepplattenfräser

### Applicable inserts · Wendeschneidplatten



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

Workpiece Material / Werkstoffe	P	M	K	N	S	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
P Steel / Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
M Stainless Steel / Rostfreier Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
K Cast iron / Gusseisen	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
N Non-ferrite material / Ne Metalle	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
S Heat-resistant steel / Warmfester Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen						CVD Coating / CVD Beschicht.					PVD Coating / PVD Beschicht.				Cermet		Carbide uncoat. unbe. Hartmetall						
		R	d	S	$\alpha^\circ$	L	Applicable tools	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	XPHT16R0803-GM	8	3.1	3.18	9	16	Φ16									●									
	XPHT20R10T3-GM	10	4.0	3.97	9	20	Φ20									●									
	XPHT25R1204-GM	12.5	4.7	4.76	9	25	Φ25									●									
	XPHT30R1506-GM	15	5.8	6.35	11	30	Φ30									●									
	XPHT32R1606-GM	16	5.8	6.35	9	32	Φ32									●									
	XPHT40R2007-GM	20	6.8	7.94	9	40	Φ40									○									
	XPHT50R2507-GM	25	9.2	7.94	9	50	Φ50									○									

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

# BMRO3

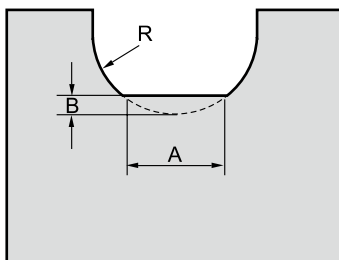


## Ball nose end mills - Serie - Kugelschaftfräser

- The unique chipbreaker design and big rake angle can effectively control the curling and flow direction of chippings and reduce the cutting force, improve workpiece surface quality and tool life.
  - The insert after precisely grinding periphery and locating surface can sufficiently ensure the shape accuracy of cutting edge and the precision of location and installation, improve the reliability of installation and the workpiece precision after machining.
  - The concave structure design of flank can effectively enhance the strength of cutting edge, and prevent the scraping between the clearance face and workpiece surface. Therefore it improves the workpiece surface quality and prolongs the life of insert.
  - The design of cutting edge over center and a big negative rake angle make it possible to cut vertically, thus the capability of anti-breakage is enhanced.
  - The rough ball nose milling cutters with big diameter adopt the top and hole clamping style, insert clamping becomes more firm and stable. The machining also is high efficiency even at the poor condition such as long overhang and large vibration etc.
  - The adapter types include straight shank, Weldon shank, Morse taper shank and compound shank.
- 
- Das einzigartige Spanbrecherdesign mit großem Spanwinkel, kontrolliert die Spanbildung und, Spanabfuhr, reduziert die Schnittkräfte und erhöht die Werkzeuglebensdauer.
  - Die umfangsgeschliffene Schneidplatte und die Präzision des Plattensitzes sind ein Garant für die Erzielung einer hohen Werkstückqualität.
  - Die konkave Schneidengeometrie erhöht die Schneidkantenstabilität und schützt die Schneide vor Ausbrüchen.
  - Die Ausführung der Zentrumsschneide und ein großer negativer Spanwinkel ermöglicht eine vertikale Bearbeitung (Zustellung) und stabilisiert das Werkzeug.
  - Der Schruppradiusfräser für größere Durchmesser ist neben der Schrauben- mit einer zusätzlichen Prattenklemmung versehen. Dadurch wird die Schneidplattenklemmung deutlich erhöht. Dies ermöglicht eine effizientere Bearbeitung auch unter ungünstigen Bedingungen, wie langer Auskragung oder bei Vibrationen.
  - Durch verschiedene Schaftausführungen kann das Werkzeugsystem auf unterschiedliche Maschinen eingesetzt werden.



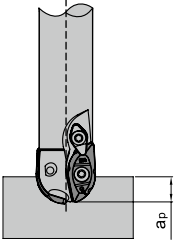
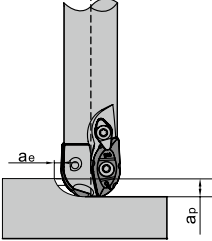
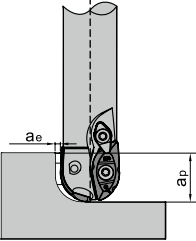
Slot shape after machining  
Nut nach der Bearbeitung



R	A	B
08	1.7	0.09
10	2.2	0.12
12.5	3.0	0.18
15	3.9	0.20
16	3.5	0.22
20	3.6	0.24
25	3.8	0.26

Diameter range  
Durchmesser Bereich Ø16

Recommended Cutting data · Schnittdaten

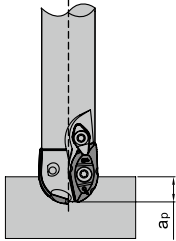
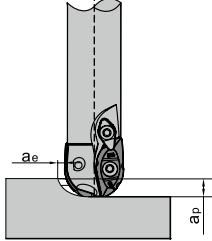
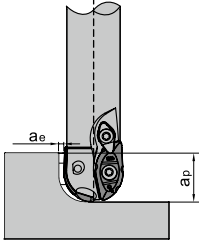
Operations Anwendung						
Workpiece material Werkstückstoff	Cutting data · Schnittdaten	Machining of slot Nuten Fräsen	Side milling (slight) Schulterfräsen		Side milling (deep) Schulterfräsen	Grade Sorte
Medium carbon steel Kohlenstoffstahl Hardness Härte 150~250HB	V(m/min)	150~220	150~220	150~220	150~220	YBG302
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a <sub>p</sub> (mm)	4	4	8	16	
	a <sub>e</sub> (mm)	--	3	4	1.5	
Alloy steel leg. Stahl Hardness Härte 150~280HB	V(m/min)	100~150	100~150	100~150	100~150	
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a <sub>p</sub> (mm)	4	4	8	16	
	a <sub>e</sub> (mm)	--	3	4	1.5	
Die steel Gesenkstahl Hardness Härte 150~255HB	V(m/min)	80~120	80~120	80~120	80~120	
	Fz(mm/z)	0.1~0.3	0.1~0.3	0.1~0.3	0.1~0.3	
	a <sub>p</sub> (mm)	4	4	8	16	
	a <sub>e</sub> (mm)	--	3	4	1.5	
Hardened steel gehärteter Stahl Hardness Härte 40~50HRC	V(m/min)	80~100	80~100	80~100	--	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	--	
	a <sub>p</sub> (mm)	4	4	8	--	
	a <sub>e</sub> (mm)	--	2	3	--	
Grey Cast iron Grauguss Hardness Härte 160~260HB	V(m/min)	250~300	250~300	250~300	250~300	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a <sub>p</sub> (mm)	4	4	8	16	
	a <sub>e</sub> (mm)	--	3	4	1.5	
Nodular Cast iron Kugelgranitguss Hardness Härte 170~300HB	V(m/min)	200~250	200~250	200~250	200~250	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a <sub>p</sub> (mm)	4	4	8	16	
	a <sub>e</sub> (mm)	--	3	4	1.5	

# Milling · Fräsen

Indexable Milling Tools · Wendepplattenfräser

## Recommended Cutting data · Schnittdaten

Diameter range Ø20

Operations Anwendung						
Workpiece material Werkstückstoff	Cutting data · Schnittdaten	Machining of slot Nuten Fräsen	Side milling (slight) Schulterfräsen		Side milling (deep) Schulterfräsen	Grade Sorte
Medium carbon steel Kohlenstoffstahl Hardness Härte 150~250HB	V(m/min)	150~220	150~220	150~220	150~220	YBG302
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a <sub>p</sub> (mm)	5	5	10	20	
	a <sub>e</sub> (mm)	--	4	5	2	
Alloy steel leg. Stahl Hardness Härte 150~280HB	V(m/min)	100~150	100~150	100~150	100~150	
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a <sub>p</sub> (mm)	5	5	10	20	
	a <sub>e</sub> (mm)	--	4	5	2	
Die steel Gesenkstahl Hardness Härte 150~255HB	V(m/min)	80~120	80~120	80~120	80~120	
	Fz(mm/z)	0.1~0.3	0.1~0.3	0.1~0.3	0.1~0.3	
	a <sub>p</sub> (mm)	5	5	10	20	
	a <sub>e</sub> (mm)	--	4	5	2	
Hardened steel gehärteter Stahl Hardness Härte 40~50HRC	V(m/min)	80~100	80~100	80~100	--	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	--	
	a <sub>p</sub> (mm)	5	5	10	--	
	a <sub>e</sub> (mm)	--	4	5	--	
Grey Cast iron Grauguss Hardness Härte 160~260HB	V(m/min)	250~300	250~300	250~300	250~300	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a <sub>p</sub> (mm)	5	5	10	20	
	a <sub>e</sub> (mm)	--	4	5	2	
Nodular Cast iron Kugelgraphitguss Hardness Härte 170~300HB	V(m/min)	200~250	200~250	200~250	200~250	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a <sub>p</sub> (mm)	5	5	10	20	
	a <sub>e</sub> (mm)	--	4	5	2	

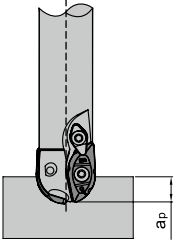
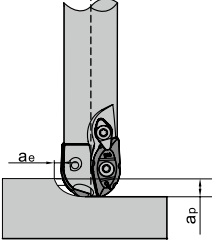
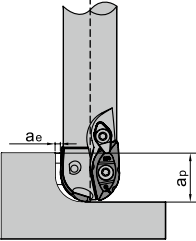
B

Milling Tools · Fräser



Diameter range  
Durchmesser Bereich Ø25

Recommended Cutting data · Schnittdaten

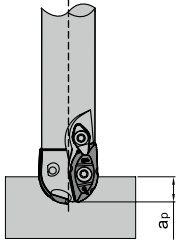
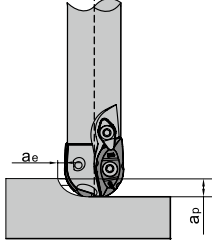
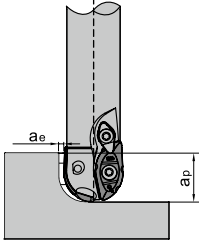
Operations Anwendung						
Workpiece material Werkstückstoff	Cutting data · Schnittdaten	Machining of slot Nuten Fräsen	Side milling (slight) Schulterfräsen		Side milling (deep) Schulterfräsen	Grade Sorte
Medium carbon steel Kohlenstoffstahl Hardness Härte 150~250HB	V(m/min)	150~220	150~220	150~220	150~220	YBG302
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a <sub>p</sub> (mm)	6	6	12.5	25	
	a <sub>e</sub> (mm)	--	5	6.5	3	
Alloy steel leg. Stahl Hardness Härte 150~280HB	V(m/min)	100~150	100~150	100~150	100~150	
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a <sub>p</sub> (mm)	6	6	12.5	25	
	a <sub>e</sub> (mm)	--	5	6.5	3	
Die steel Gesenkstahl Hardness Härte 150~255HB	V(m/min)	80~120	80~120	80~120	80~120	
	Fz(mm/z)	0.1~0.3	0.1~0.3	0.1~0.3	0.1~0.3	
	a <sub>p</sub> (mm)	6	6	12.5	25	
	a <sub>e</sub> (mm)	--	5	6.5	3	
Hardened steel gehärteter Stahl Hardness Härte 40~50HRC	V(m/min)	80~100	80~100	80~100	--	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	--	
	a <sub>p</sub> (mm)	6	6	12.5	--	
	a <sub>e</sub> (mm)	--	5	6.5	--	
Grey Cast iron Grauguss Hardness Härte 160~260HB	V(m/min)	250~300	250~300	250~300	250~300	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a <sub>p</sub> (mm)	6	6	12.5	25	
	a <sub>e</sub> (mm)	--	5	6.5	3	
Nodular Cast iron Kugelgraphitguss Hardness Härte 170~300HB	V(m/min)	200~250	200~250	200~250	200~250	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a <sub>p</sub> (mm)	6	6	12.5	25	
	a <sub>e</sub> (mm)	--	5	6.5	3	

# Milling · Fräsen

Indexable Milling Tools · Wendepplattenfräser

Diameter range  
Durchmesser Bereich Ø30, Ø32

## Recommended Cutting data · Schnittdaten

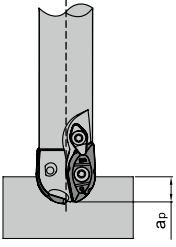
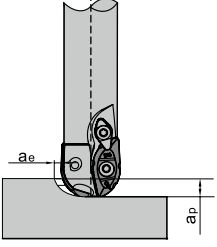
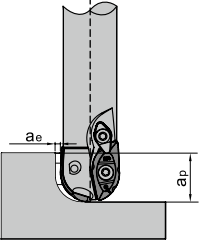
Operations Anwendung						
Workpiece material Werkstückstoff	Cutting data · Schnittdaten	Machining of slot Nuten Fräsen	Side milling (slight) Schulterfräsen		Side milling (deep) Schulterfräsen	Grade Sorte
Medium carbon steel Kohlenstoffstahl Hardness Härte 150~250HB	V(m/min)	150~220	150~220	150~220	150~220	YBG302
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a <sub>p</sub> (mm)	10	10	16	28	
	a <sub>e</sub> (mm)	--	6	9	6	
Alloy steel leg. Stahl Hardness Härte 150~280HB	V(m/min)	100~150	100~150	100~150	100~150	
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a <sub>p</sub> (mm)	10	10	16	28	
	a <sub>e</sub> (mm)	--	6	9	6	
Die steel Gesenkstahl Hardness Härte 150~255HB	V(m/min)	80~120	80~120	80~120	80~120	
	Fz(mm/z)	0.1~0.3	0.1~0.3	0.1~0.3	0.1~0.3	
	a <sub>p</sub> (mm)	10	10	16	28	
	a <sub>e</sub> (mm)	--	6	9	6	
Hardened steel gehärteter Stahl Hardness Härte 40~50HRC	V(m/min)	80~100	80~100	80~100	--	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	--	
	a <sub>p</sub> (mm)	10	10	16	--	
	a <sub>e</sub> (mm)	--	6	9	--	
Grey Cast iron Grauguss Hardness Härte 160~260HB	V(m/min)	250~300	250~300	250~300	250~300	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a <sub>p</sub> (mm)	10	10	16	28	
	a <sub>e</sub> (mm)	--	6	9	6	
Nodular Cast iron Kugelgraphitguss Hardness Härte 170~300HB	V(m/min)	200~250	200~250	200~250	200~250	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a <sub>p</sub> (mm)	10	10	16	28	
	a <sub>e</sub> (mm)	--	6	9	6	

B

Milling Tools · Fräser

Diameter range  
Durchmesser Bereich Ø40

Recommended Cutting data · Schnittdaten

Operations Anwendung						
Workpiece material Werkstückstoff	Cutting data · Schnittdaten	Machining of slot Nuten Fräsen	Side milling (slight) Schulterfräsen		Side milling (deep) Schulterfräsen	Grade Sorte
Medium carbon steel Kohlenstoffstahl Hardness Härte 150~250HB	V(m/min)	150~220	150~220	150~220	150~220	YBG302
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a <sub>p</sub> (mm)	12	10	20	35	
	a <sub>e</sub> (mm)	--	8	12	8	
Alloy steel leg. Stahl Hardness Härte 150~280HB	V(m/min)	100~150	100~150	100~150	100~150	
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a <sub>p</sub> (mm)	12	10	20	35	
	a <sub>e</sub> (mm)	--	8	12	8	
Die steel Gesenkstahl Hardness Härte 150~255HB	V(m/min)	80~120	80~120	80~120	80~120	
	Fz(mm/z)	0.1~0.3	0.1~0.3	0.1~0.3	0.1~0.3	
	a <sub>p</sub> (mm)	12	10	20	35	
	a <sub>e</sub> (mm)	--	8	12	8	
Hardened steel gehärteter Stahl Hardness Härte 40~50HRC	V(m/min)	80~100	80~100	80~100	--	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	--	
	a <sub>p</sub> (mm)	12	10	20	--	
	a <sub>e</sub> (mm)	--	8	12	--	
Grey Cast iron Grauguss Hardness Härte 160~260HB	V(m/min)	250~300	250~300	250~300	250~300	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a <sub>p</sub> (mm)	12	10	20	35	
	a <sub>e</sub> (mm)	--	8	12	8	
Nodular Cast iron Kugelgrfitguss Hardness Härte 170~300HB	V(m/min)	200~250	200~250	200~250	200~250	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a <sub>p</sub> (mm)	12	10	20	35	
	a <sub>e</sub> (mm)	--	8	12	8	

# Milling · Fräsen

Indexable Milling Tools · Wendepplattenfräser

Diameter range  
Durchmesser Bereich Ø50

Recommended Cutting data · Schnittdaten

Operations Anwendung						
Workpiece material Werkstückstoff	Cutting data · Schnittdaten	Machining of slot Nuten Fräsen	Side milling (slight) Schulterfräsen		Side milling (deep) Schulterfräsen	Grade Sorte
Medium carbon steel Kohlenstoffstahl Hardness Härte 150~250HB	V(m/min)	150~220	150~220	150~220	150~220	YBG302
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a <sub>p</sub> (mm)	15	10	25	40	
	a <sub>e</sub> (mm)	--	10	15	10	
Alloy steel leg. Stahl Hardness Härte 150~280HB	V(m/min)	100~150	100~150	100~150	100~150	
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a <sub>p</sub> (mm)	15	10	25	40	
	a <sub>e</sub> (mm)	--	10	15	10	
Die steel Gesenkstahl Hardness Härte 150~255HB	V(m/min)	80~120	80~120	80~120	80~120	
	Fz(mm/z)	0.1~0.3	0.1~0.3	0.1~0.3	0.1~0.3	
	a <sub>p</sub> (mm)	15	10	25	40	
	a <sub>e</sub> (mm)	--	10	15	10	
Hardened steel gehärteter Stahl Hardness Härte 40~50HRC	V(m/min)	80~100	80~100	80~100	--	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	--	
	a <sub>p</sub> (mm)	15	10	25	--	
	a <sub>e</sub> (mm)	--	10	15	--	
Grey Cast iron Grauguss Hardness Härte 160~260HB	V(m/min)	250~300	250~300	250~300	250~300	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a <sub>p</sub> (mm)	15	10	25	40	
	a <sub>e</sub> (mm)	--	10	15	10	
Nodular Cast iron Kugelgrafitguss Hardness Härte 170~300HB	V(m/min)	200~250	200~250	200~250	200~250	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a <sub>p</sub> (mm)	15	10	25	40	
	a <sub>e</sub> (mm)	--	10	15	10	

B

Milling Tools · Fräser

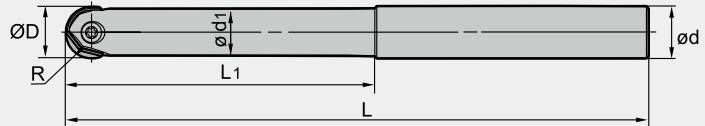


### Profil milling tools · Profilfräser

**BMR04** **P** **M** **K**



Straight shank  
Zylinder Schaft



### ■ Specification of tools · Werkzeug Beschreibung

Type · Typ		Stock Lager	Dimensions (mm) · Abmessungen						Weight Gewicht (kg)
			R	Ø D	ø d	ø d <sub>1</sub>	L <sub>1</sub>	L	
<b>BMR04</b>	-012-G12-M	●	6	12	12	11	35	125	0.1
	-012-G12-L	●	6	12	12	11	45	150	0.1
	-016-G16-M	●	8	16	16	14	40	150	0.2
	-016-G16-L	●	8	16	16	14	55	180	0.3
	-020-G20-M	●	10	20	20	18	65	180	0.4
	-020-G20-L	●	10	20	20	18	100	250	0.6
	-025-G25-M	●	12.5	25	25	23	70	200	0.7
	-025-G25-L	●	12.5	25	25	23	100	250	0.9
	-030-G32-M	●	15	30	32	27	80	250	1.2
	-030-G32-L	●	15	30	32	27	110	300	1.5
	-032-G32-M	●	16	32	32	29	80	250	1.4
	-032-G32-L	●	16	32	32	29	110	300	1.7

# Milling · Fräsen

Indexable Milling Tools · Wendeplattenfräser

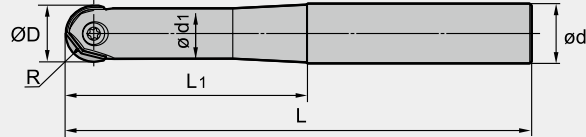
## Profil milling tools · Profilfräser



**BMR04** P M K



Straight shank  
Zylinderschaft







### ■ Specification of tools · Werkzeug Beschreibung

Type · Typ		Stock Lager	Dimensions (mm) · Abmessungen						Weight Gewicht (kg)
			R	Ø D	ø d	ø d <sub>1</sub>	L <sub>1</sub>	L	
<b>BMR04</b>	-012-G16-M	●	6	12	16	11	50	125	0.2
	-012-G16-L	●	6	12	16	11	70	150	0.2
	-016-G20-M	●	8	16	20	14	60	150	0.3
	-016-G20-L	●	8	16	20	14	80	180	0.3
	-020-G25-M	●	10	20	25	18	75	180	0.6
	-020-G25-L	●	10	20	25	18	95	200	0.6
	-025-G32-M	●	12.5	25	32	23	90	200	1.0
	-025-G32-L	●	12.5	25	32	23	110	250	1.3
	-030-G40-M	●	15	30	40	27	110	250	2.0
	-030-G40-L	●	15	30	40	27	125	300	2.4
	-032-G40-M	●	16	32	40	29	110	250	2.0
	-032-G40-L	●	16	32	40	29	125	300	2.4

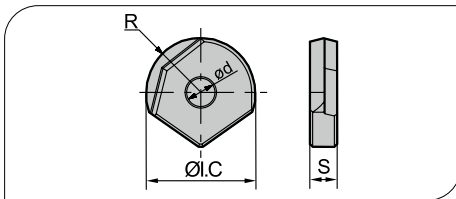
● Ex Stock / ab Lager ○ On demand / auf Anfrage




### Spare parts · Ersatzteile

Diameter Durchmesser Ø D	Screw Schraube	Wrench Schlüssel	
			
Ø12	I90M4×10TT	WT15P	--
Ø16	I90M5×11TT	WT20P	--
Ø20	I90M5×13.5TT	WT20P	--
Ø25	I70M6×20TT	WT20P	--
Ø30	I70M8×25TT	--	WT30IT
Ø32	I70M8×25TT	--	WT30IT

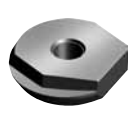
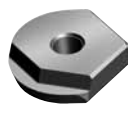


### Applicable inserts · Wendschneidplatten



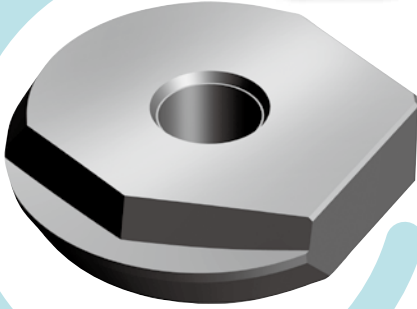
-  Ideal Machining Condition / Gute Bearbeitungsbedingungen
-  Normal Machining Condition / Normale Bearbeitungsbedingungen
-  Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen

Workpiece Material / Werkstoffe	P	M	K	N	S
Steel / Stahl					
Stainless Steel / Rostfreier Stahl					
Cast iron / Gusseisen					
Non-ferrous material / Ne Metalle					
Heat-resistant steel / Warmfester Stahl					

Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		R	I.C.	S	d	Applicable insert Ø D	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	ZOHX1203-GF	6	12	3	4	Ø12																		
	ZOHX1604-GF	8	16	4	5	Ø16																		
	ZOHX2005-GF	10	20	5	5	Ø20																		
	ZOHX2506-GF	12.5	25	6	6	Ø25																		
	ZOHX3007-GF	15	30	7	8	Ø30																		
	ZOHX3207-GF	16	32	7	8	Ø32																		
	ZOHX1203-GM	6	12	3	4	Ø12																		
	ZOHX1604-GM	8	16	4	5	Ø16																		
	ZOHX2005-GM	10	20	5	5	Ø20																		
	ZOHX2506-GM	12.5	25	6	6	Ø25																		
	ZOHX3007-GM	15	30	7	8	Ø30																		
	ZOHX3207-GM	16	32	7	8	Ø32																		

# BMR04

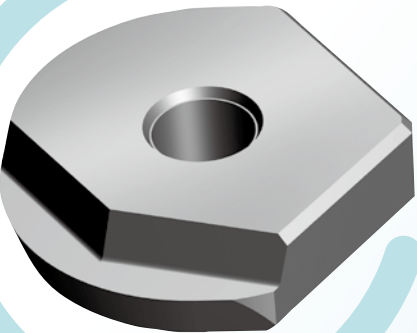
**-GF**



Positive rake angle and double clearance angle, the design of curved cutting edge take both sharpness and strength into consideration. The edge with high precision is applicable in the stable machining condition and the condition with high precision demand for workpiece profile.

Das spezielle Design aus positivem Spanwinkel und doppeltem Freiwinkel ermöglicht sowohl eine scharfe wie auch stabile Schneidkantenausführung. Die GF-Geometrie eignet sich besonders für Hochpräzisions- und Schlichtbearbeitung unter stabilen Maschinenbedingungen.

**-GM**



0° rake angle, only one clearance angle, high edge strength. Suitable for the machining condition requiring high cutting efficiency.

0° Grad Spanwinkel mit definiertem Freiwinkel ergeben eine sehr stabile Schneidkante. Für mittlere Bearbeitung mit hoher Effizienz.

The grade YBG 252 is a perfect combination of ultra fine grain carbide substrate and nano PVD-Coating.

Die Sorte YBG 252 ist die ideale Kombination von ultra Feinkorn-Hartmetallsubstrat und einer nano PVD-Beschichtung.



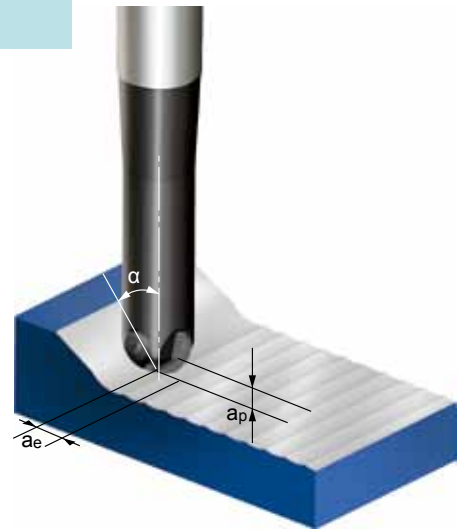
Calculation of cutting data for ball nose endmills (BMR02/04 series)  
Kalkulation der Schnittdaten für Kugelkopffräser (BMR02/04)

1. when tool axial line is vertical to the machined surface  
axiale Werkzeugachse zur vertikalen Fräsfläche:

$$N = \frac{1000 Vc}{\pi Dc} (r/min)$$

$$Dc = 2\sqrt{a_p(D - a_p)}$$

- N: revolution/min · Umdrehung/min  
Vc: real cutting speed · effektive Schnittgeschwindigkeit  
Dc: effective cutting diameter · effektive Ø  
D: tool nominal diameter · nominale Ø  
a<sub>p</sub>: axial cutting depth · axiale Schnitttiefe



2. When there is a inclined angle between the tool axial line and the machined surface, the recommended cutting speed should be multiplied by a factor in the follow table to obtain the cutting speed used for programming

2. Unter Berücksichtigung des Neigungswinkel, (Werkzeugachse/ bearbeitenden Oberfläche) erhalten Sie die empfohlene Schnittgeschwindigkeit, durch in der Tabelle angegebene Multiplikator.

Diameter (mm) Ø		Ø12		Ø16		Ø20		Ø25		Ø30		Ø32	
depth of cut Schnitttiefe a <sub>p</sub> (mm)		0.2	0.5	0.2	0.5	0.5	1	0.5	1	0.5	1.5	0.5	1.5
Inclined angle	15°	1.00	1.00	1.00	1.00	1.00	1.02	1.00	1.01	1.00	1.00	1.00	1.00
	30°	1.04	1.01	1.05	1.01	1.02	1.04	1.03	1.04	1.04	1.01	1.04	1.00
	45°	1.16	1.07	1.18	1.10	1.12	1.06	1.14	1.08	1.16	1.06	1.16	1.06
Neigungs- winkel α	60°	1.42	1.24	1.47	1.30	1.34	1.21	1.38	1.25	1.42	1.21	1.43	1.22
	75°	2.02	1.60	2.14	1.73	1.83	1.53	1.93	1.62	2.01	1.53	2.04	1.55
	90°	3.92	2.50	4.48	2.87	3.20	2.29	3.57	2.55	3.9	2.29	4.03	2.37

# Milling · Fräsen

Indexable Milling Tools · Wendeplattenfräser

## Recommended Cutting data · Schnittdaten

Workpiece material Werkstück- stoff	Hardness HB	Grade Sorte	Cutting data · Schnittdaten	Tool specification					
				Ø12	Ø16	Ø20	Ø25	Ø30	Ø32
<b>P</b>	carbon steel leg. Kohlenstoff- stahl HB≤180	YBG252	V(m/min)	100~200	100~200	100~200	100~200	100~200	100~200
			fz(mm/z)	0.15~0.25	0.2~0.3	0.2~0.3	0.25~0.35	0.25~0.35	0.25~0.35
			a <sub>pmax</sub> (mm)	0.8	1	1.25	1.5	2	2
			a <sub>emax</sub> (mm)	0.8	1	1.25	1.5	2	2
	Alloy steel Leg. Stahl HB180~280		V(m/min)	80~180	80~180	80~180	80~180	80~180	80~180
			fz(mm/z)	0.15~0.25	0.2~0.3	0.2~0.3	0.25~0.35	0.25~0.35	0.25~0.35
			a <sub>pmax</sub> (mm)	0.8	1	1.25	1.5	2	2
			a <sub>emax</sub> (mm)	0.8	1	1.25	1.5	2	2
	Hardened steel gehärteter Stahl HRC55~65		V(m/min)	60~100	60~100	60~100	60~100	60~100	60~100
			fz(mm/z)	0.15~0.25	0.2~0.3	0.2~0.3	0.25~0.35	0.25~0.35	0.25~0.35
			a <sub>pmax</sub> (mm)	0.4	0.5	0.6	0.8	1	1
			a <sub>emax</sub> (mm)	0.4	0.5	0.6	0.8	1	1
<b>M</b>	Stainless steel Rostfreier Stahl HB≤270	V(m/min)	70~150	70~150	70~150	70~150	70~150	70~150	
		fz(mm/z)	0.1~0.2	0.1~0.25	0.1~0.25	0.2~0.3	0.2~0.3	0.2~0.3	
		a <sub>pmax</sub> (mm)	0.6	0.8	1	1.25	1.5	1.5	
		a <sub>emax</sub> (mm)	0.6	0.8	1	1.25	1.5	1.5	
<b>K</b>	Cast iron Gusseisen HB180-250	V(m/min)	160~300	160~300	160~300	160~300	160~300	160~300	
		fz(mm/z)	0.2~0.3	0.25~0.35	0.25~0.35	0.3~0.4	0.3~0.4	0.3~0.4	
		a <sub>pmax</sub> (mm)	1	1.5	1.8	2	2.5	2.5	
		a <sub>emax</sub> (mm)	1	1.5	1.8	2	2.5	2.5	

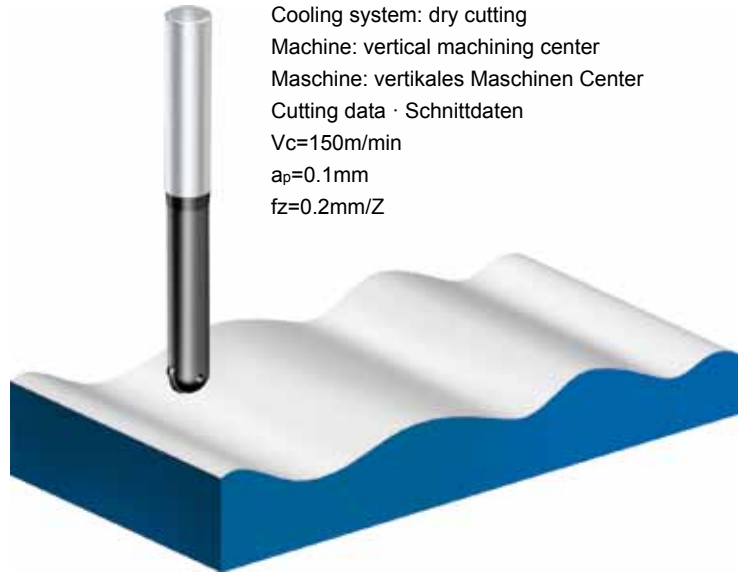
● Ex Stock / ab Lager ○ On demand / auf Anfrage

### Case study for BMR04 Bearbeitungsbeispiel für BMR04



- ToolWerkzeug: BMR04-020-G25-M
- Insert type/grade: ZOHX2005-GM/YBG252

Workpiece material  
Werkstück-  
stoff: 42CrMo (HRC35)  
Cooling system: dry cutting  
Machine: vertical machining center  
Maschine: vertikales Maschinen Center  
Cutting data · Schnittdaten  
Vc=150m/min  
ap=0.1mm  
fz=0.2mm/Z



### ● Abrasion comparison of inserts after milling curved face

**ZCC-CT**

Other company product

60minutes later



Flank abrasion 0.08



Flank abrasion 0.10

120minutes later



Flank abrasion 0.12



Flank abrasion 0.16

## Side and face milling tools · Scheiben- und Planfräser code key

Milling tool type Fräsertyp	
<b>FM</b>	Face milling Planfräsen
<b>EM</b>	Square shoulder milling /Eckfräsen
<b>HM</b>	Helical end milling Spiralfräsen
<b>SM</b>	Side and face milling Eck- und Planfräsen
<b>BM</b>	Profile milling Profilfräsen
<b>CM</b>	Chamfer milling Fasfräsen
<b>XM</b>	Special milling Spezialfräsen

Approach angle Anstellwinkel		
<b>P</b>	90°	
<b>E</b>	75°	
<b>D</b>	60°	
<b>A</b>	45°	
<b>R</b>		

Sequence number of series  
Serien Nummer

Cutting diameter ØD (mm)  
Fräserdurchmesser

Cutting width of milling tools  
Schnittbreite

Coupling structure and demension  
Aufnahmetyp

<b>A</b>	A type	<b>D</b>	D type
<b>B</b>	B type	<b>K</b>	Mounting by keyway
<b>C</b>	C type		

**SM P 03 - 160 × 16 - K40**

**- M P 12 - 12 L**

Insert · WSP	
<b>C</b>	Diamond with 80°
<b>D</b>	Diamond with 55°
<b>R</b>	Round
<b>S</b>	Square
<b>T</b>	Regular triangle
<b>V</b>	Diamond with 35°
<b>M</b>	Diamond with 86°

Insert clearance angle Freiwinkel	
<b>N</b>	0°
<b>B</b>	5°
<b>C</b>	7°
<b>P</b>	11°
<b>D</b>	15°
<b>E</b>	20°

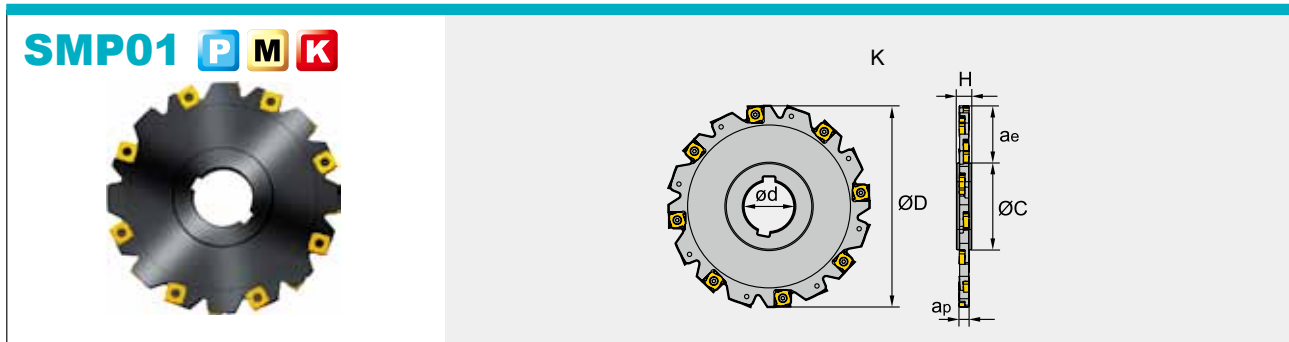
Diameter of IC	Length of cutting edge Schneidkantenlänge					
	Insert · WSP					
	<b>C</b>	<b>D</b>	<b>R</b>	<b>S</b>	<b>T</b>	<b>V</b>
5.556	—	—	—	—	09	—
6.350	06	07	—	—	11	—
9.525	09	11	09	09	16	16
12.700	12	15	12	12	22	22
15.875	16	19	15	15	27	—
19.050	19	—	19	19	33	—
25.400	25	—	25	25	44	—

Cutting direction  
Schnitttrichtung

(R: right L: left)  
(R: rechts L: links)

Number of teeth  
Zähnezahl

### Side and face milling tools · Scheibenfräser



#### ■ Specification of tools · Werkzeug Beschreibung

Type · Typ		Stock Lager		Dimensions (mm) · Abmessungen						Inserts WSP	No. of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)
		R	L	Ø D	Ø d	Ø c	H	a <sub>p</sub>	a <sub>e</sub> max				
SMP01 Mounting by keyway	-100×4-K27-SN12-10	○	○	100	27	40.7	12	4	25	XSEQ1202	10	K	0.2
	-125×4-K40-SN12-12	○	○	125	40	50.5	12	4	32		12	K	0.3
	-160×4-K40-SN12-16	○	○	160	40	66.7	12	4	44		16	K	0.5
	-100×5-K27-SN12-10	○	○	100	27	45	12	5	25	XSEQ1203	10	K	0.2
	-125×5-K40-SN12-12	○	○	125	40	58	12	5	31		12	K	0.3
	-160×5-K40-SN12-16	○	○	160	40	68	12	5	44		16	K	0.6
	-100×6-K27-SN12-10	○	○	100	27	45	12	6	25	XSEQ12T3	10	K	0.3
	-125×6-K40-SN12-12	○	○	125	40	58	12	6	31		12	K	0.4
	-160×6-K40-SN12-16	○	○	160	40	68	12	6	44		16	K	0.7
	-200×6-K50-SN12-18	○	○	200	50	67.7	12	6	62	XSEQ1204	18	K	1.1
	-250×6-K50-SN12-24	○	○	250	50	72	12	6	87		24	K	1.7
	-100×7-K27-SN12-10	○	○	100	27	45	12	7	25		10	K	0.3
	-125×7-K40-SN12-12	○	○	125	40	58	12	7	31	XSEQ1204	12	K	0.4
	-160×7-K40-SN12-16	○	○	160	40	68	12	7	44		16	K	0.8
	-200×7-K50-SN12-18	○	○	200	50	72	12	7	62		18	K	1.2
	-250×7-K50-SN12-24	○	○	250	50	72	12	7	87	XSEQ12T4	24	K	1.9
	-100×8-K27-SN12-10	○	○	100	27	45	12	8	25		10	K	0.3
	-125×8-K40-SN12-12	○	○	125	40	58	12	8	31		12	K	0.5
	-160×8-K40-SN12-16	○	○	160	40	68	12	8	44	XSEQ12T4	16	K	0.9
	-200×8-K50-SN12-18	○	○	200	50	72	12	8	62		18	K	1.4
-250×8-K50-SN12-24	○	○	250	50	72	12	8	87	24		K	2.2	

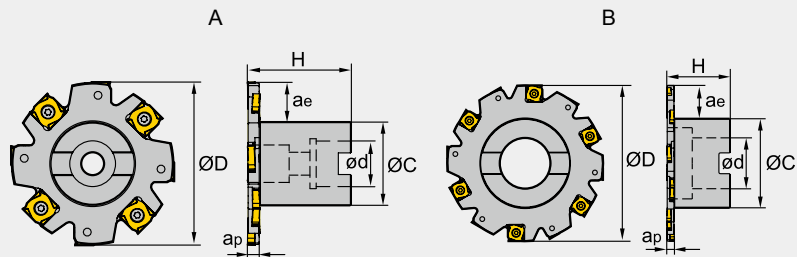
# Milling · Fräsen

Indexable Milling Tools · Wendeplattenfräser

## Side and face milling tools · Scheibenfräser



**SMP01** P M K






### Specification of tools · Werkzeug Beschreibung

Type · Typ	Stock Lager		Dimensions (mm) · Abmessungen							Inserts WSP	No. of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)
	R	L	Ø D	ø d	ø c	H	ap	aemax					
<b>SMP01</b> Arbor mounting	-063×4-A22-SN12-06	○	○	63	22	40	50	4	10	XSEQ1202	6	A	0.2
	-080×4-A22-SN12-08	○	○	80	22	40	50	4	18		8	A	0.4
	-100×4-A27-SN12-10	○	○	100	27	48	50	4	23		10	A	0.6
	-063×5-A22-SN12-06	○	○	63	22	40	50	5	10	XSEQ1203	6	A	0.2
	-080×5-A22-SN12-08	○	○	80	22	40	50	5	18		8	A	0.4
	-100×5-A27-SN12-10	○	○	100	27	48	50	5	23		10	A	0.7
	-063×6-A22-SN12-06	○	○	63	22	40	50	6	10	XSEQ12T3	6	A	0.2
	-080×6-A22-SN12-08	○	○	80	22	40	50	6	18		8	A	0.5
	-100×6-A27-SN12-10	○	○	100	27	48	50	6	23		10	A	0.7
	-125×6-B40-SN12-12	○	○	125	40	70	50	6	24	XSEQ1204	12	B	1.0
-160×6-B40-SN12-16	○	○	160	40	70	50	6	41	16		B	1.3	
-063×7-A22-SN12-06	○	○	63	22	40	50	7	10	6		A	0.2	
-080×7-A22-SN12-08	○	○	80	22	40	50	7	18	XSEQ1204	8	A	0.5	
-100×7-A27-SN12-10	○	○	100	27	48	50	7	23		10	A	0.7	
-125×7-B40-SN12-12	○	○	125	40	70	50	7	24		12	B	1.1	
-160×7-B40-SN12-16	○	○	160	40	70	50	7	41	XSEQ12T4	16	B	1.4	
-063×8-A22-SN12-06	○	○	63	22	40	50	8	10		6	A	0.2	
-080×8-A22-SN12-08	○	○	80	22	40	50	8	18		8	A	0.5	
-100×8-A27-SN12-10	○	○	100	27	48	50	8	23	XSEQ12T4	10	A	0.8	
-125×8-B40-SN12-12	○	○	125	40	70	50	8	24		12	B	1.1	
-160×8-B40-SN12-16	○	○	160	40	70	50	8	41		16	B	1.5	

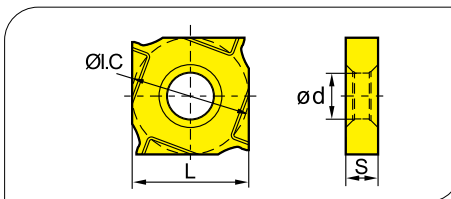
● Ex Stock / ab Lager ○ On demand / auf Anfrage


### Spare parts · Ersatzteile

Diameter Durchmesser Ø D	Cutting width $a_p$	Screw Schraube	Wrench Schlüssel
			
Ø63-Ø160	4	I91M4×3.3X	WT10S
Ø63-Ø160	5	I91M4×4.3X	
Ø63-Ø250	6	I91M4×5.3X	
Ø63-Ø250	7	I91M4×6.3X	
Ø63-Ø250	8	I91M4×7.3X	




### Applicable inserts · Wendeschneidplatten



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

Workpiece Material / Werkstoffe	P	M	K	N	S	Steel / Stahl	Stainless Steel / Rostfreier Stahl	Cast iron / Gusseisen	Non-ferrite material / Ne Metalle	Heat-resistant steel / Warmfester Stahl
P	●	●	●	●	●	●	●	●	●	●
M	●	●	●	●	●	●	●	●	●	●
K	●	●	●	●	●	●	●	●	●	●
N	●	●	●	●	●	●	●	●	●	●
S	●	●	●	●	●	●	●	●	●	●

Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen				CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.				Cermets		Carbide uncoat. unbe. Hartmetall					
		I.C	L	S	d	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	<b>XSEQ1202</b>	12.7	12.7	2.3	5.0																		
	<b>XSEQ1203</b>	12.7	12.7	3.0	5.0										○								
	<b>XSEQ12T3</b>	12.7	12.7	3.5	5.0	○									○								
	<b>XSEQ1204</b>	12.7	12.7	4.0	5.0										○								
	<b>XSEQ12T4</b>	12.7	12.7	4.5	5.0																		

# Milling · Fräsen

Indexable Milling Tools · Wendeplattenfräser

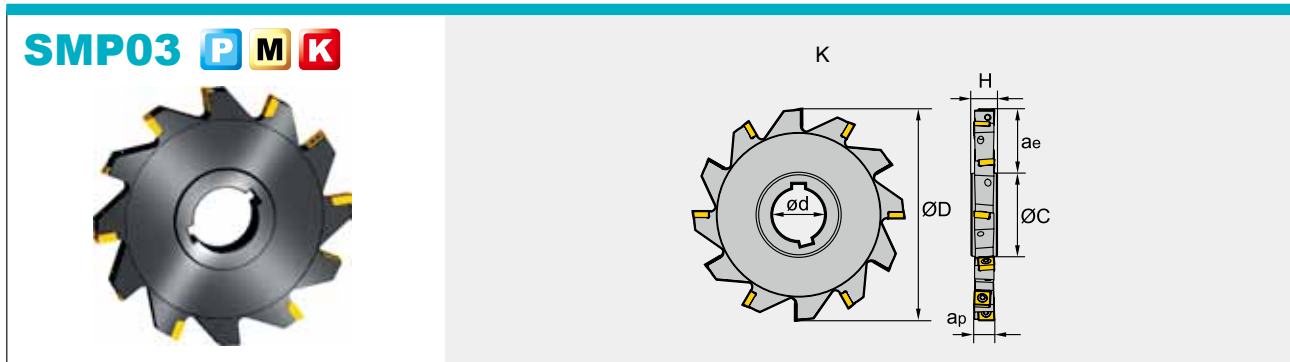
## Recommended Cutting data · Schnittdaten

Workpiece material Werkstück- stoff	Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten	
			V(m/min)	f(mm/z)
<b>P</b> Low-carbon steel Soft steel Niedrig legierter Kohlenstoffstahl Baustahl	≤180	YBG202	180 (100-250)	0.1(0.08-0.25)
		YBG302	150 (100-200)	0.15(0.1-0.3)
	180-280	YBG202	150 (80-250)	0.1(0.08-0.25)
		YBG302	120 (80-200)	0.15(0.1-0.3)
	280-350	YBG202	120 (80-250)	0.1(0.08-0.25)
		YBG302	100 (80-200)	0.15(0.1-0.3)
<b>M</b> Stainless steel Rostfreier Stahl	≤270	YBG202	120 (80-250)	0.1(0.05-0.15)
		YBG302	100 (80-200)	0.08(0.05-0.15)
<b>K</b> Cast iron Gusseisen	180-250	YBG152	120 (80-250)	0.1(0.05-0.15)
		YBG302	150 (100-250)	0.08(0.05-0.15)

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






### Side and face milling tools · Scheibenfräser




#### ■ Specification of tools · Werkzeug Beschreibung

Type · Typ		Stock Lager		Dimensions (mm) · Abmessungen						Inserts WSP	No. of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)
		R	L	Ø D	ø c	ø d	a <sub>emax</sub>	a <sub>p</sub>	H				
SMP03 Mounting by keyway	-080×8-K27-MP06-10	○	○	80	41	27	17	8	12	MPHT060304-DM	10	K	0.2
	-100×8-K32-MP06-14	○	○	100	47	32	25	8	12		14	K	0.3
	-100×10-K32-MP06-14	○	○	100	47	32	25	10	14		14	K	0.4
	-125×10-K40-MP06-16	○	○	125	55	40	34	10	14		16	K	0.6
	-125×12-K40-MP08-12	○	○	125	55	40	34	12	16	MPHT080305-DM	12	K	0.7
	-160×12-K40-MP08-14	○	○	160	62	40	47	12	16		14	K	1.3
	-160×16-K40-MP12-12	○	○	160	62	40	49	16	20	MPHT120408-DM	12	K	1.6
	-160×18-K40-MP12-12	○	○	160	62	40	49	18	24		12	K	1.9
	-160×20-K40-MP12-12	○	○	160	62	40	49	18	26		12	K	2.1
	-200×16-K50-MP12-14	○	○	200	72	50	62	16	20		14	K	2.5
	-200×18-K50-MP12-14	○	○	200	72	50	62	18	24		14	K	2.9
	-200×20-K50-MP12-14	○	○	200	72	50	63	20	26		14	K	3.3

#### ■ Spare parts · Ersatzteile

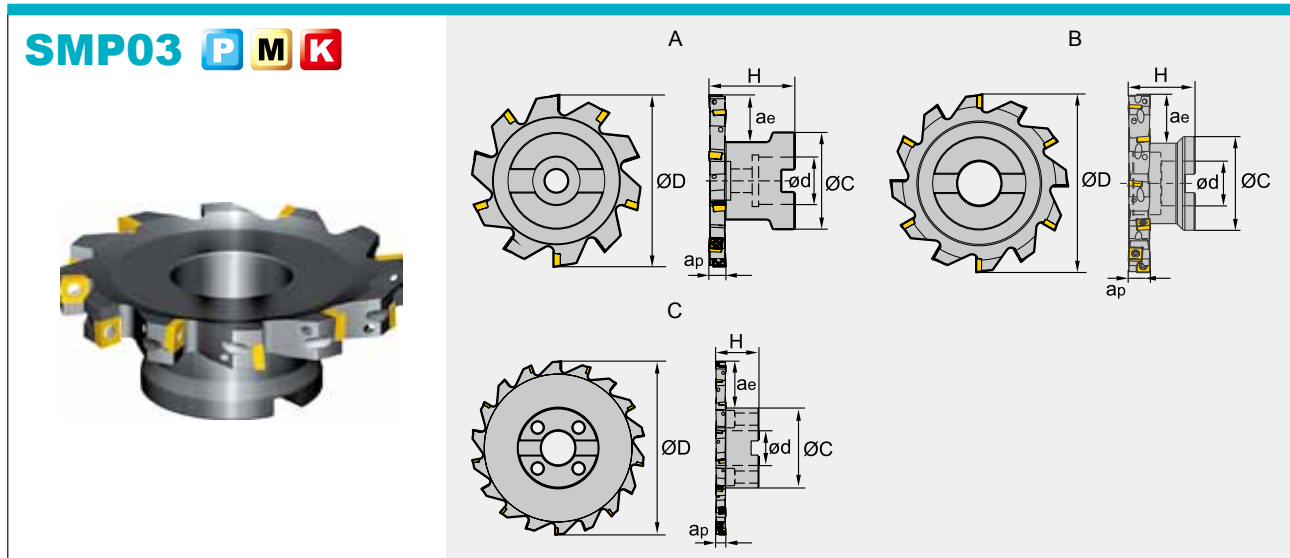
Diameter Durchmesser Ø D	Insert	Screw Schraube	Wrench Schlüssel	
				
Ø80-Ø125	MP06	I60M2.5x6.5	WT07IP	
Ø125-Ø160	MP08	I60M3x7	WT09P	
Ø160-Ø200	MP12	I60M5x13		WT20IS



# Milling · Fräsen

Indexable Milling Tools · Wendeplattenfräser




## Side and face milling tools · Scheibenfräser



### ■ Specification of tools · Werkzeug Beschreibung

Type · Typ		Stock Lager		Dimensions (mm) · Abmessungen						Inserts WSP	No. of teeth Zähne	Applicable inserts	Weight Gewicht (kg)
		R	L	$\varnothing D$	$\varnothing c$	$\varnothing d$	$a_{e\max}$	$a_p$	H				
SMP03 Arbor mounting	-080×8-A22-MP06-10	○	○	80	45	22	21	8	40	MPHT060304-DM	10	A	0.4
	-100×8-B27-MP06-14	○	○	100	55	27	24	8	40		14	B	0.6
	-100×10-B27-MP06-14	○	○	100	55	27	24	10	40		14	B	0.7
	-125×10-B32-MP06-16	○	○	125	65	32	33	10	45		16	B	1.1
	-125×12-B32-MP08-12	○	○	125	65	32	33	12	45	MPHT080305-DM	12	B	1.4
	-160×12-B40-MP08-14	○	○	160	80	40	45	12	50		14	B	1.9
	-200×12-C40-MP08-18	○	○	200	92	40	53	12	50	18	C	3.2	
	-125×16-B32-MP12-10	○	○	125	65	32	30	16	50	MPHT120408-DM	10	B	2.3
	-160×16-B40-MP12-12	○	○	160	80	40	45	16	60		12	B	2.3
	-160×18-B40-MP12-12	○	○	160	80	40	45	18	60		12	B	2.4
	-200×16-C40-MP12-14	○	○	200	92	40	53	16	50		14	C	3.6
	-200×18-C40-MP12-14	○	○	200	92	40	53	18	50		14	C	3.9
-200×20-C40-MP12-14	○	○	200	92	40	53	20	50	14		C	4.2	

### ■ Spare parts · Ersatzteile

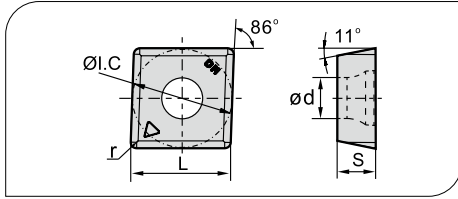
Diameter Durchmesser $\varnothing D$	Insert	Screw Schraube	Wrench Schlüssel	
				
$\varnothing 80$ - $\varnothing 125$	MP06	I60M2.5×6.5	WT071P	
$\varnothing 125$ - $\varnothing 200$	MP08	I60M3×7	WT09P	
$\varnothing 125$ - $\varnothing 200$	MP12	I60M5×13		WT20IS

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

# Milling · Fräsen

## Indexable Milling Tools · Wendepplattenfräser

### Applicable inserts · Wendeschneidplatten



		● Ideal Machining Condition Gute Bearbeitungsbedingungen	● Normal Machining Condition Normale Bearbeitungsbedingungen	● Unfavorable Machining Condition Ungünstige Bearbeitungsbedingungen
Workpiece Material Werkstoffe	<b>P</b> Steel / Stahl	●	●	●
	<b>M</b> Stainless Steel / Rostfreier Stahl	●	●	●
	<b>K</b> Cast iron / Gusseisen	●	●	●
	<b>N</b> Non-ferrite material / Ne Metalle	●	●	●
	<b>S</b> Heat-resistant steel / Warmfester Stahl	●	●	●

Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating CVD Beschicht.					PVD Coating PVD Beschicht.					Cermet		Carbide uncoat. unbe. Hartmetall						
		I.C	L	S	d	r	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201	
	<b>MPHT060304-DM</b>	6.35	6.35	3.18	2.8	0.4			●						●										
	<b>MPHT080305-DM</b>	8.3	8.3	3.18	5.56	0.5			●						○										
	<b>MPHT120408-DM</b>	12.7	12.7	4.76	5.56	0.8			●						●										

### Recommended Cutting data · Schnittdaten

Workpiece material Werkstückstoff	Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten	
			V(m/min)	f(mm/z)
<b>P</b> Low-carbon steel Soft steel Niedrig legierter Kohlenstoffstahl Baustahl	≤180	YBG202	180 (100-250)	0.1(0.08-0.25)
		YBG302	150 (100-200)	0.15(0.1-0.3)
	180-280	YBG202	150 (80-250)	0.1(0.08-0.25)
		YBG302	120 (80-200)	0.15(0.1-0.3)
	280-350	YBG202	120 (80-250)	0.1(0.08-0.25)
		YBG302	100 (80-200)	0.15(0.1-0.3)
<b>M</b> Stainless steel Rostfreier Stahl	≤270	YBG202	120 (80-250)	0.1(0.05-0.15)
		YBG302	100 (80-200)	0.08(0.05-0.15)
<b>K</b> Cast iron Gusseisen	180-250	YBG152	120 (80-250)	0.1(0.05-0.15)
		YBG302	150 (100-250)	0.08(0.05-0.15)

Applicable tool **B9-B15**  
Werkzeug

Tools code key **B24-B25**  
Werkzeug ISO

Grade selection guide **B17-23**  
Sortenauswahl

Technical data **B182-B188**  
Technische Daten

# Milling · Fräsen

Indexable Milling Tools · Wendepplattenfräser

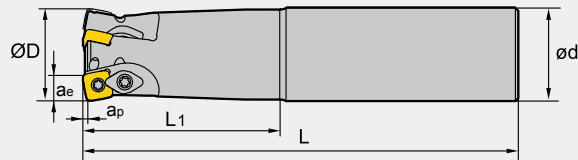
## High feed milling cutters · Hochvorschubfräser



**XMR01** P M K



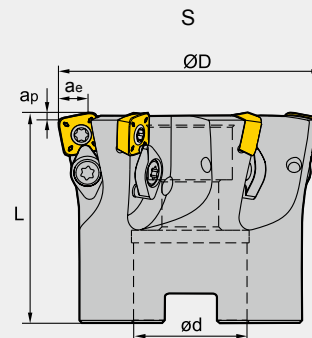
S type insert, straight shank  
S Typ WSP, Zylinder Schaft



### ■ Specification of tools · Werkzeug Beschreibung with Internal Cooling · Mit Innenkühlung

Type · Typ	Stock Lager	Dimensions (mm) · Abmessungen							No. of teeth Zähne	Weight Gewicht (kg)
		Ø D	ap	ae	L <sub>1</sub>	L	Ø d			
<b>XMR01</b> -025-G25-SD09-02	●	25	1.4	8.8	60	140	25	2	0.5	
-032-G32-SD09-03	●	32	1.4	8.8	70	150	32	3	0.8	
-035-G32-SD09-03	○	35	1.4	8.8	70	150	32	3	0.8	
-032-G32-SD12-02	●	32	1.8	11.7	70	150	32	2	0.8	
-040-G40-SD12-03	●	40	1.8	11.7	70	150	40	3	1.3	

**XMR01** P M K



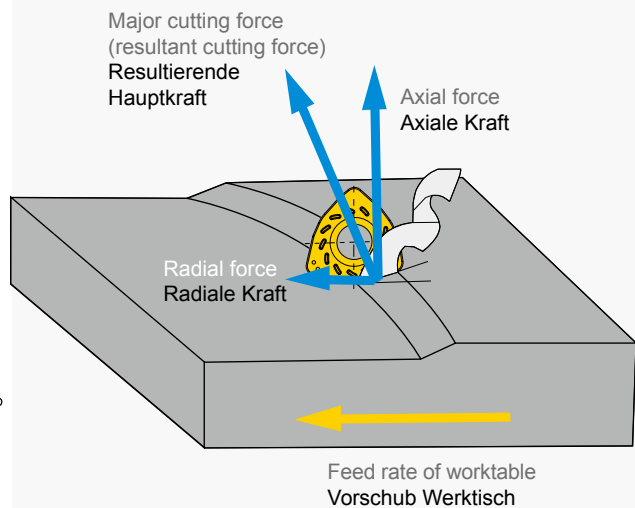
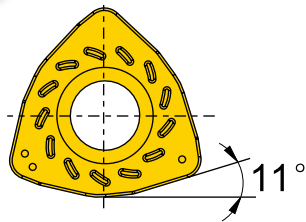
### ■ Specification of tools · Werkzeug Beschreibung with Internal Cooling · mit Innenkühlung

Type · Typ	Stock Lager	Dimensions (mm) · Abmessungen						No. of teeth Zähne	Coupling Aufnahme	Weight Gewicht (kg)
		Ø D	ap	ae	L	Ø d				
<b>XMR01</b> -050-A22-SD09-04	●	50	1.4	8.8	40	22	4	A	0.3	
-063-A22-SD09-06	●	63	1.4	8.8	40	22	6	A	0.5	
-063-A27-SD09-06	○	63	1.4	8.8	50	27	6	A	0.6	
-063-A22-SD12-05	●	63	1.8	11.7	40	22	5	A	0.5	
-063-A27-SD12-05	○	63	1.8	11.7	50	27	5	A	0.6	
-080-A27-SD12-05	●	80	1.8	11.7	63	27	5	A	0.9	
-100-B32-SD12-06	●	100	1.8	11.7	50	32	6	B	1.8	

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



# **XMR01** series high feed milling tools **Hochvorschubfräser**



The feature of high feed tool is to resolve the major cutting force into the axial direction, greatly reduce the radial cutting force, thus improve tool's capability of shock resistance. In addition, this structure can effectively reduce the vibration in long overhang milling application.

Die Merkmale dieses Hochvorschubfräasers sind die Ablenkung der Hauptkraft in axiale Richtung. Dadurch wird die radiale Kraft deutlich verringert, was eine Reduzierung oder Vibration ermöglicht und somit lange Standzeiten auch bei größeren Auskräglängen zur Folge hat.



### High feed milling cutters · Hochvorschubschafffräser



**XMR01 P M K**







W type insert, straight shank  
W Typ WSP, Zylinder Schaft



### Specification of tools · Werkzeug Beschreibung

Type · Typ	Stock Lager	Dimensions (mm) · Abmessungen							No. of teeth Zähne	Weight Gewicht (kg)
		Ø D	ap	ae	L1	L	ø d			
<b>XMR01</b> -020-G20-WP05-02-M	●	20	1.5	3.8	50	130	20	2	0.2	
-020-G20-WP05-02-L	●	20	1.5	3.8	100	180	20	2	0.3	
-020-G20-WP05-02-XL	○	20	1.5	3.8	130	250	20	2	0.8	
-025-G25-WP06-02-M	●	25	1.5	4.35	60	140	25	2	0.4	
-025-G25-WP06-02-L	○	25	1.5	4.35	120	200	25	2	0.6	
-025-G25-WP06-02-XL	○	25	1.5	4.35	180	300	25	2	1.0	
-032-G32-WP06-03-M	○	32	1.5	4.35	70	150	32	3	0.8	
-032-G32-WP06-03-L	●	32	1.5	4.35	120	200	32	3	1.0	
-032-G32-WP06-03-XL	○	32	1.5	4.35	180	300	32	3	1.6	
-040-G32-WP06-03-M	○	40	1.5	4.35	50	150	32	3	0.9	
-040-G32-WP06-03-L	○	40	1.5	4.35	50	250	32	3	1.5	
-040-G32-WP06-03-XL	○	40	1.5	4.35	50	300	32	3	1.8	
-040-G32-WP08-02-M	○	40	1.5	5.66	50	150	32	2	0.9	
-040-G32-WP08-02-L	○	40	1.5	5.66	50	250	32	2	1.5	
-040-G32-WP08-02-XL	○	40	1.5	5.66	50	300	32	2	1.9	
-050-G32-WP09-02-M	○	50	3.0	6.8	50	150	32	2	1.9	
-050-G32-WP09-02-L	○	50	3.0	6.8	50	250	32	2	2.5	

### Spare parts · Ersatzteile

Tool Werkzeug	Clamp/Insert Screw Schraube	Clamp Pratze	Wrench Schlüssel	
				
XMR01**-WP05**	I60M3.5×08TT	—	WT10P	—
XMR01**-WP06**	I60M4×8.4	—	WT15P	—
XMR01**-WP08**	I60M5×13	WD-208	—	WT20IT
XMR01**-WP09**			—	



# Milling · Fräsen

Indexable Milling Tools · Wendeplattenfräser

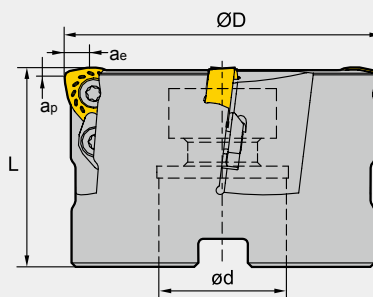
## High feed milling cutters · Hochvorschubfräser



**XMR01** P M K






W type insert, Arbor mounting  
W Typ WSP, Aufsteckfräser



### Specification of tools · Werkzeug Beschreibung

Type · Typ	Stock Lager	Dimensions (mm) · Abmessungen					No. of teeth Zähne	Inserts WSP	Weight Gewicht (kg)
		Ø D	ap	ae	L	ø d			
<b>XMR01</b> -050-A22-WP06-04	○	50	1.5	4.35	50	22	4	A	0.4
-050-A22-WP08-03	○	50	1.5	5.66	50	22	3	A	0.4
-063-A22-WP08-04	●	63	1.5	5.66	50	22	4	A	0.7
-063-A27-WP08-04	○	63	1.5	5.66	50	27	4	A	0.7
-080-A27-WP08-05	●	80	1.5	5.66	63	27	5	A	1.5
-100-B32-WP08-06	○	100	1.5	5.66	63	32	6	B	2.2
-125-B40-WP08-07	●	125	1.5	5.66	63	40	7	B	3.5
-160-B40-WP08-08	○	160	1.5	5.66	63	40	8	B	6.0
-063-A22-WP09-03	○	63	3.0	6.8	50	22	3	A	0.7
-080-A27-WP09-04	○	80	3.0	6.8	63	27	4	A	1.4
-100-B32-WP09-05	○	100	3.0	6.8	63	32	5	B	2.1
-125-B40-WP09-06	○	125	3.0	6.8	63	40	6	B	3.7
-160-B40-WP09-07	○	160	3.0	6.8	63	40	7	B	6.3

### Spare parts · Ersatzteile

Tool Werkzeug	Clamp / Insert Screw Pratze / WSP Schraube	Clamp Pratze	Wrench Schlüssel	
				
XMR01**-WP06**	I60M4×8.4	--	WT15S	--
XMR01**-WP08**	I60M5×13	WD-208	--	WT20IT
XMR01**-WP09**	I60M5×13	WD-208	--	



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

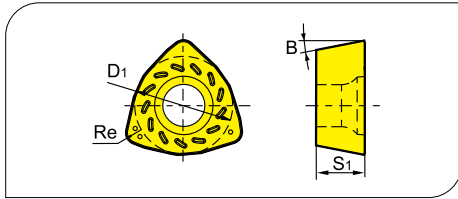


# Milling · Fräsen

## Indexable Milling Tools · Wendepplattenfräser

### Applicable inserts · Wendschneidplatten

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



Workpiece Material / Werkstoffe	P	M	K	N	S	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201	
<b>P</b> Steel / Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
<b>M</b> Stainless Steel / Rostfreier Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
<b>K</b> Cast iron / Gusseisen	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
<b>N</b> Non-ferrite material / Ne Metalle	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
<b>S</b> Heat-resistant steel / Warmfester Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen				CVD Coating CVD Beschicht.						PVD Coating PVD Beschicht.					Cermet		Carbide uncoat. unbe. Hartmetall					
		B	Re	S <sub>1</sub>	D <sub>1</sub>	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201	
	<b>WPGT050315ZSR</b>	11°	1.5	3.5	7.94				●															
	<b>WPGT060415ZSR</b>	11°	1.5	4.2	9.525				●															
	<b>WPGT080615ZSR</b>	11°	1.5	6.35	12.85				●					●										
	<b>WPGT090725ZSR</b>	11°	2.5	7	15				●															

Applicable tool **B9-B15**  
Werkzeug

Tools code key **B24-B25**  
Werkzeug ISO

Grade selection guide **B17-23**  
Sortenauswahl

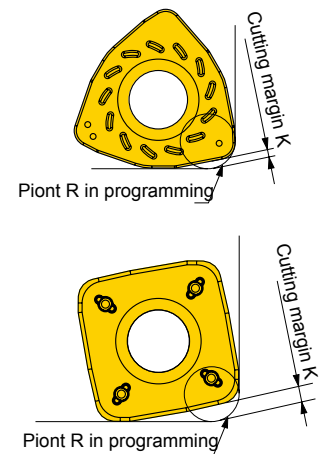
Technical data **B182-B188**  
Technische Daten

# Milling · Fräsen

Indexable Milling Tools · Wendepplattenfräser

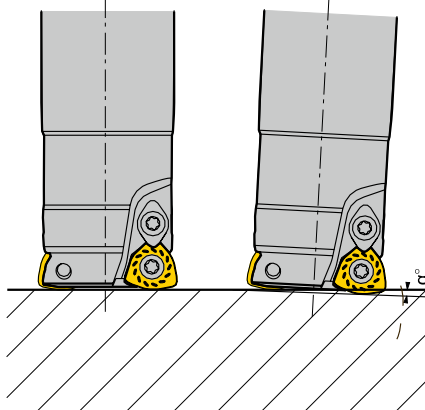
## Approximate R in machining program Ungefährer Programmerradius

Insert · WSP	approx./ca. R(mm)	Cutting margin K(mm)
WPGT050315ZSR	2	0.5
WPGT060415ZSR	2.5	0.7
WPGT080615ZSR	2.0	0.7
WPGT090725ZSR	4.0	1.2
SDMT09T312-DM	2.5	0.87
SDMT120412-DM	4.0	0.93

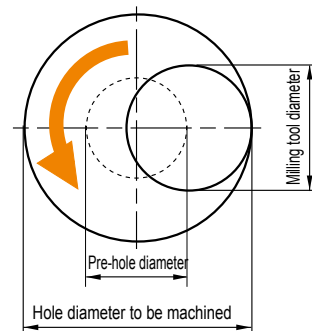


## Different machining styles

### ■ Ramp machining Tauchfräsen



### ■ Helical interpolation milling Zirkularfräsen



- Reduce the feed rate in ramp and helical machining operations.
- Set the axial feed rate below 0.2mm/rev in drilling operation.
- Be careful ! Long chippings may fly out in drilling operation.
- The cutting depth of each rotation can't exceed the maximum cutting depth (  $a_p$  )
- The S type insert not only is applied in the machining operations mentioned above, but also able to be used for plunge milling.

- Beim Tauch- und Zirkularfräsen den Vorschub reduzieren.
- Vorschub bei Bohroperationen (achsial) unter 0,2 mm einstellen.
- "Vorsicht" – Beim Bohren können lange Späne entstehen.
- Die Schnitttiefe pro Rotation kann die maximale Schnitttiefe  $a_p$  nicht erreichen.
- Die S-Type Wendeschneidplatten können auch für andere Bearbeitungsoperationen eingesetzt werden.

## XMR01-Serie

**XMR01 series** tools ( install SD\*\*inserts) possess perfect edge strength and excellent economical efficiency, have more advantages in face milling.

**XMR01 series** tools ( install WP\*\*inserts) possess good capability of chip removal, have more advantages in cavity milling.

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

Werkzeuge mit Schneidplatten (SD\*\*) besitzen ausgezeichnete Schneidkantenstabilität. Sie haben besondere Vorteile beim Planfräsen mit hoher Wirtschaftlichkeit.

Werkzeuge mit Schneidplatten (WP..) haben besondere Vorteile bei der Spanabfuhr und werden vorteilhaft beim Auskoffern eingesetzt.

### Recommended Cutting data · Schnittdaten

	Workpiece material Werkstück- stoff	Hardness HB Härte	Grade Sorte	Cutting speed Schnitt- geschw. (m/min)	Ø25		Ø30/32/35	
					Axial cutting depth	Feed rate per tooth	Axial cutting depth	Feed rate per tooth
<b>P</b>	carbon steel Soft steel legierter Kohlenstoffstahl Baustahl	≤HB180 HB180- 280	YBM351	170(120-220) 150(100-200)	0.6~1.0	0.8~1.2	0.8~1.2	1.0~1.4
	Alloy steel Leg. Stahl Alloy tool steel Leg. Werkzeugstahl	HB280-350 ≤HB350	YBM351	130(80-180)	0.4~0.8	0.8~1.2	0.6~1.0	1.0~1.4
	hardened steel gehärteter Stahl	≤HRC35	YBM351	120(80-160)	0.4~0.8	0.6~1.0	0.6~1.0	0.8~1.2
<b>M</b>	Stainless steel Rostfreier Stahl	≤HB270	YBM351	120(80-160)	0.6~1.0	0.6~1.0	0.8~1.2	0.8~1.2
<b>K</b>	cast Iron Gusseisen	Tensile strength ≤350MPa	YBG302	150(100-200)	0.6~1.0	1.0~1.4	0.8~1.2	1.2~1.6
	Nodular Cast iron Kugelgrafitguss Temperguss	Tensile strength ≤800MPa	YBG302	120(80-160)	0.4~0.8	0.8~1.2	0.6~1.0	1.0~1.4

### Recommended Cutting data · Schnittdaten

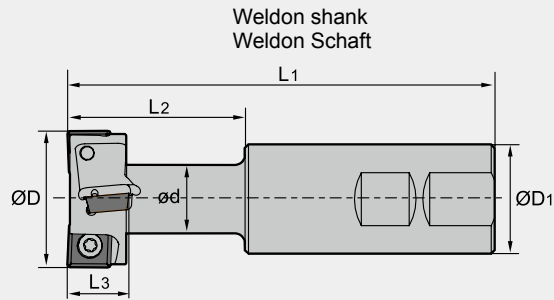
	Workpiece material Werkstück- stoff	Hardness HB Härte	Grade Sorte	Cutting speed Schnitt- geschw. (m/min)	Ø40		Ø50/63		Ø80/100	
					Axial cutting depth	Feed rate per tooth	Axial cutting depth	Feed rate per tooth	Axial cutting depth	Feed rate per tooth
<b>P</b>	carbon steel Soft steel legierter Kohlenstoffstahl Baustahl	≤HB180 HB180- 280	YBM351	170(120-220) 150(100-200)	0.8~1.2	1.0~1.4	1.1~1.5	1.1~1.5	1.0~1.5	1.0~1.5
	Alloy steel Leg. Stahl Alloy tool steel Leg. Werkzeugstahl	HB280-350 ≤HB350	YBM351	130(80-180)	0.6~1.0	1.0~1.4	0.9~1.3	1.1~1.5	0.8~1.3	1.0~1.5
	hardened steel gehärteter Stahl	≤HRC35	YBM351	120(80-160)	0.6~1.0	0.8~1.2	0.9~1.3	0.9~1.3	0.8~1.3	0.8~1.3
<b>M</b>	Stainless steel Rostfreier Stahl	≤HB270	YBM351	120(80-160)	0.8~1.2	0.8~1.2	1.1~1.5	0.9~1.3	1.0~1.5	0.8~1.3
<b>K</b>	cast Iron Gusseisen	Tensile strength ≤350MPa	YBG302	150(100-200)	0.8~1.2	1.2~1.6	1.1~1.5	1.3~1.7	1.0~1.5	1.2~1.7
	Nodular Cast iron Kugelgrafitguss Temperguss	Tensile strength ≤800MPa	YBG302	120(80-160)	0.6~1.0	1.0~1.4	0.9~1.3	1.1~1.5	0.8~1.3	1.0~1.5

### T-slot milling tools · T-Nuten Fräser

Kr:90°






#### TMP01 **K**



#### ■ Specification of tools · Werkzeug Beschreibung

Type · Typ	Stock Lager	Dimensions (mm) · Abmessungen							No. of teeth Zähne	Number of insert Anzahl WSP	T-slot specification
		Ø D	Ø D <sub>1</sub>	ø d	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>				
<b>TMP01</b> -021-XP25-MP06-01	●	21	25	10	100	32	9	1	2	12	
-025-XP25-MP06-01	●	25	25	12	100	35	11	1	2	14	
-032-XP32-MP08-02	●	32	32	15	110	45	14	2	4	18	
-040-XP32-MP12-02	●	40	32	19	125	55	18	2	4	22	
-050-XP40-MP12-02	●	50	40	25	140	65	22	2	4	28	
-060-XP50-MP12-02	●	60	50	32	160	80	28	2	6	36	

#### ■ Spare parts · Ersatzteile

Tool Werkzeug	Screw Schraube	Wrench Schlüssel	
			
TMP01-021-XP25-MP06-01	I60M2.5×5.5	WT07IP	--
TMP01-025-XP25-MP06-01	I60M2.5×5.5		
TMP01-032-XP32-MP08-02	I60M3×7	WT10IP	--
TMP01-040-XP32-MP12-02	I60M5×10	--	WT20IT
TMP01-050-XP40-MP12-02	I60M5×10		
TMP01-060-XP50-MP12-02	I60M5×10		

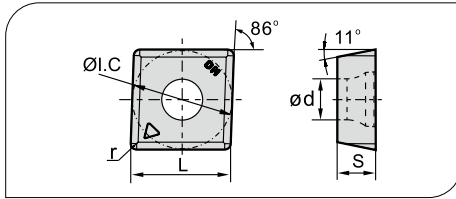


● Ex Stock / ab Lager ○ On demand / auf Anfrage

# Milling · Fräsen

## Indexable Milling Tools · Wendepplattenfräser

### Applicable inserts · Wendschneidplatten

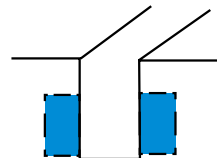


- Ideal Machining Condition / Gute Bearbeitungsbedingungen
- Normal Machining Condition / Normale Bearbeitungsbedingungen
- Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen

Workpiece Material / Werkstoffe	P	M	K	N	S	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
P Steel / Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
M Stainless Steel / Rostfreier Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
K Cast iron / Gusseisen	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
N Non-ferrite material / Ne Metalle	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
S Heat-resistant steel / Warmfester Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating CVD Beschicht.					PVD Coating PVD Beschicht.					Cermet		Carbide uncoat. unbe. Hartmetall					
		I.C	L	s	d	r	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	MPHT060304-DM	6.35	6.35	3.18	2.8	0.4			●							●								
	MPHT080305-DM	8.3	8.3	3.18	3.4	0.5			●							○								
	MPHT120408-DM	12.7	12.7	4.76	5.56	0.8			●							●								

Workpiece before machining / Werkstück vor der Bearbeitung



### Recommended Cutting data · Schnittdaten

Workpiece material / Werkstückstoff	Grade / Sorte	Cutting data · Schnittdaten		
		V(m/min)	f(mm/z)	Cooling
<b>K</b>	YBG302	80~160	0.05~0.2	Wet / Dry Nass/ Trocken

Applicable tool / Werkzeug **B9-B15**

Tools code key / Werkzeug ISO **B24-B25**

Grade selection guide / Sortenauswahl **B17-23**

Technical data / Technische Daten **B182-B188**

# Milling · Fräsen

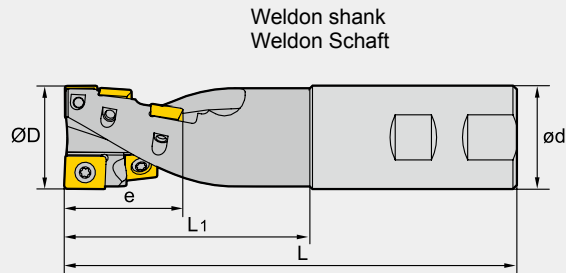
Indexable Milling Tools · Wendepplattenfräser

## Helical end mill · Walzenstirnfräser

Kr:90°





**HMP01** **P** **K**




### ■ Specification of tools · Werkzeug Beschreibung

Type · Typ		Stock Lager		Dimensions (mm) · Abmessungen				Number of flute Z	Number of insert Anzahl WSP		Shank type Schaft	
		R	L	Ø D	ø d	e	L <sub>1</sub>		L	APKT 150412-**		SPMT 120408-**
<b>HMP01</b>	-040×55-XP40-SP12-02	○	○	40	40	55	95	175	2	1	5	Weldon
	-050×55-XP40-SP12-04	○	○	50	40	55	95	175	4	2	10	Weldon

### ■ Spare parts · Ersatzteile

Diameter Durchmesser Ø D	Screw Schraube	Wrench Schlüssel
Ø40	 I60M5×10	 WT20IS
Ø50	I60M5×13	WT20IS



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

### Helical end mill · Walzenstirnräser

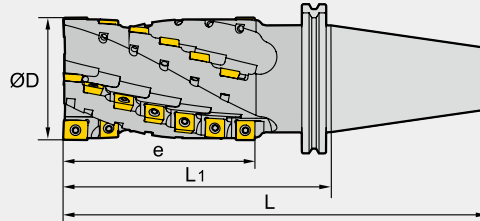
**Kr:90°**



**HMP01 P K**



JT shank/BT shank (figure is JT shank)  
JT Schaft/BT Schaft (Abb. is JT shank)



### ■ Specification of tools · Werkzeug Beschreibung

Type · Typ	Stock Lager		Dimensions (mm) · Abmessungen				Number of flute Zähne Z	Number of insert Anzahl WSP		Shank type Schaft	
	R	L	Ø D	e	L <sub>1</sub>	L		APKT 150412-**	SPMT 120408-**		
<b>HMP01</b>	-050×84-JT50-SP12-04	○	○	50	84	145	246.75	4	2	16	JT
	-063×74-JT50-SP12-04	○	○	63	74	135	236.75	4	2	14	JT
	-063×104-JT50-SP12-04	○	○	63	104	165	266.75	4	2	20	JT
	-063×134-JT50-SP12-04	○	○	63	134	195	296.75	4	2	26	JT
	-080×104-JT50-SP12-04	○	○	80	104	165	266.75	4	2	20	JT
	-080×144-JT50-SP12-04	○	○	80	144	205	306.75	4	2	28	JT
	-050×84-BT50-SP12-04	○	○	50	84	145	246.8	4	2	16	BT
	-063×74-BT50-SP12-04	○	○	63	74	135	236.8	4	2	14	BT
	-063×104-BT50-SP12-04	○	○	63	104	165	266.8	4	2	20	BT
	-063×134-BT50-SP12-04	○	○	63	134	195	296.8	4	2	26	BT
	-080×104-BT50-SP12-04	○	○	80	104	165	266.8	4	2	20	BT
	-080×144-BT50-SP12-04	○	○	80	144	205	306.8	4	2	28	BT

### ■ Spare parts · Ersatzteile

Diameter Durchmesser Ø D	Screw Schraube	Wrench Schlüssel	
Ø50	I60M5×13	WT20IS	
Ø63	I60M5×13	WT20IS	
Ø80	I60M5×13	WT20IS	

# Milling · Fräsen

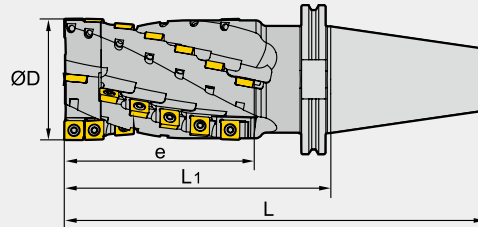
Indexable Milling Tools · Wendeplattenfräser

Helical endmills with interchangeable heads  
Walzenstirnfräser mit austauschbarem Kopf

Kr:90°



**HMP01 EC P K**



## Specification of tools · Werkzeug Beschreibung

Type · Typ	Stock Lager		Dimensions (mm) · Abmessungen				Number of flute Zähne Z	Number of insert Anzahl WSP		Shank type Schaft	
	R	L	Ø D	e	L <sub>1</sub>	L		APKT 150412-**	SPMT 120408-**		
<b>HMP01</b>	-050×84EC-JT50-SP12-04	○	○	50	84	145	246.75	4	2	16	JT
	-063×74EC-JT50-SP12-04	○	○	63	74	135	236.75	4	2	14	JT
	-063×104EC-JT50-SP12-04	○	○	63	104	165	266.75	4	2	20	JT
	-063×134EC-JT50-SP12-04	○	○	63	134	195	296.75	4	2	26	JT
	-080×104EC-JT50-SP12-04	○	○	80	104	165	266.75	4	2	20	JT
	-080×144EC-JT50-SP12-04	○	○	80	144	205	306.75	4	2	28	JT
	-050×84EC-BT50-SP12-04	○	○	50	84	145	246.8	4	2	16	BT
	-063×74EC-BT50-SP12-04	○	○	63	74	135	236.8	4	2	14	BT
	-063×104EC-BT50-SP12-04	○	○	63	104	165	266.8	4	2	20	BT
	-063×134EC-BT50-SP12-04	○	○	63	134	195	296.8	4	2	26	BT
	-080×104EC-BT50-SP12-04	○	○	80	104	165	266.8	4	2	20	BT
	-080×144EC-BT50-SP12-04	○	○	80	144	205	306.8	4	2	28	BT

## Spare parts · Ersatzteile

Diameter Durchmesser Ø D	Insert Screw WSP Schraube	Screw of head Schraube für Kopf	Wrench of insert Screw Schlüssel f. WSP	Wrench of head Schlüssel für Kopf	Interchangeable head Austauschbarer Kopf	
Ø50	I60M5×13	M10×50	WT20IS	WH80L	050EC	
Ø63	I60M5×13	M10×50	WT20IS	WH80L	063EC	
Ø80	I60M5×13	M12×55	WT20IS	WH100L	080EC	

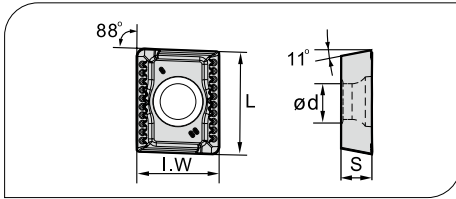
● Ex Stock / ab Lager ○ On demand / auf Anfrage



# Milling · Fräsen

## Indexable Milling Tools · Wendepplattenfräser

### Applicable inserts · Wendeschneidplatten

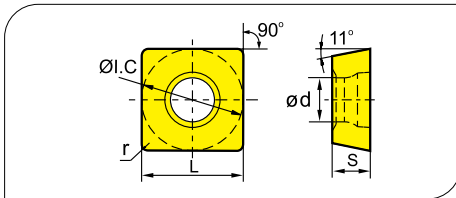


- Ideal Machining Condition / Gute Bearbeitungsbedingungen
- Normal Machining Condition / Normale Bearbeitungsbedingungen
- Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen

Workpiece Material / Werkstoffe	P	M	K	N	S	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
P Steel / Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
M Stainless Steel / Rostfreier Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
K Cast iron / Gusseisen	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
N Non-ferrite material / Ne Metalle	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
S Heat-resistant steel / Warmfester Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating / CVD Beschicht.					PVD Coating / PVD Beschicht.					Cermet		Carbide uncoat. unbe. Hartmetall					
		L	I.W	S	d	r	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	APKT150412-PM	16.33	12.7	4.76	5.4	1.2										●	○							
	APKT150412-KM	16.33	12.7	4.76	5.4	1.2										○	●							

### Applicable inserts · Wendeschneidplatten



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

Workpiece Material / Werkstoffe	P	M	K	N	S	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
P Steel / Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
M Stainless Steel / Rostfreier Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
K Cast iron / Gusseisen	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
N Non-ferrite material / Ne Metalle	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
S Heat-resistant steel / Warmfester Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating / CVD Beschicht.					PVD Coating / PVD Beschicht.					Cermet		Carbide uncoat. unbe. Hartmetall					
		L	I.C	S	d	r	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SPMT120408-PM	12.7	12.7	4.76	5.5	0.8										●	○							
	SPMT120408-KM	12.7	12.7	4.76	5.5	0.8										○	●							

Applicable tool B9-B15  
Werkzeug

Tools code key B24-B25  
Werkzeug ISO

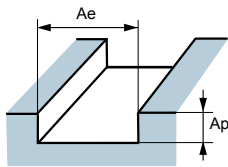
Grade selection guide B17-23  
Sortenauswahl

Technical data B182-B188  
Technische Daten

# Milling · Fräsen

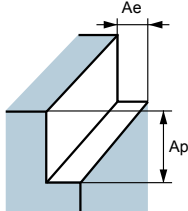
## Indexable Milling Tools · Wendeplattenfräser

**A** Slot milling  
Nutenfräsen



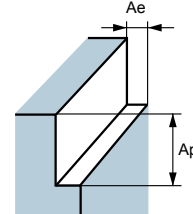
$A_e = D$   
 $A_p = 0.5D$  (cast iron/Guss)  
Maximum 12mm (steel/Stahl)

**B** Square shoulder milling  
breites Eckfräsen



$A_e = 0.5D$   
 $A_p = 1.5D$  (cast iron/Guss)  
1.0D (steel/Stahl)

**C** Narrow shoulder milling  
schmales Eckfräsen



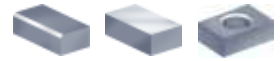
$A_e = 0.1D$   
 $A_p \leq$  Maximum cutting length

### Recommended Cutting data · Schnittdaten

Workpiece material Werkstück- stoff	Hardness HB Härte	Grade Sorte	Cutting data · Schnittdaten		Operation (figure/Abb.)
			Cutting speed Schnittgeschw. (m/min)	Feed speed Vorschub (mm/z)	
<b>P</b> Low-carbon steel Soft steel niedrig legierter Kohlenstoffstahl Baustahl  High-carbon steel hoch legierter Kohlenstoffstahl Alloy steel Leg. Stahl  Alloy tool steel Leg. Werkzeugstahl	≤180	YBG302	80(60-90)	0.25(0.1-0.35)	A
			90(70-120)	0.3(0.15-0.4)	B
			90(70-120)	0.3(0.15-0.4)	C
	180-280	YBG302	70(60-100)	0.2(0.1-0.35)	A
			80(60-120)	0.25(0.15-0.35)	B
			90(70-120)	0.25(0.15-0.35)	C
	280-350	YBG302	50(40-80)	0.15(0.08-0.25)	A
			60(50-100)	0.2(0.1-0.35)	B
			70(50-100)	0.2(0.1-0.35)	C
<b>K</b> cast Iron Gusseisen	180-250	YBG152 YBG302	70(50-100)	0.2(0.1-0.35)	A
			80(60-120)	0.25(0.15-0.35)	B
			90(80-120)	0.25(0.15-0.35)	C

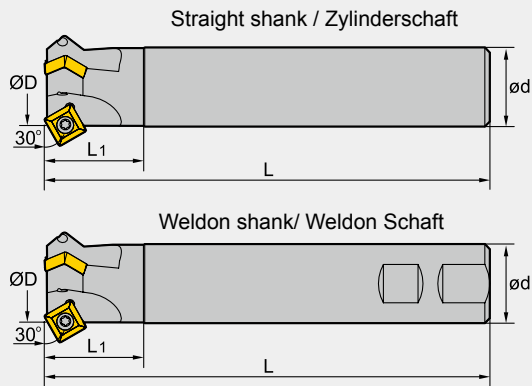
● Ex Stock / ab Lager ○ On demand / auf Anfrage

Kr:30°



### Chamfer milling tools · Fasfräser

**CMZ01** P M K



#### ■ Specification of tools · Werkzeug Beschreibung

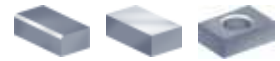
Type · Typ		Stock Lager	Dimensions (mm) · Abmessungen				No. of teeth Zähne	Weight Gewicht (kg)
			Ø D	ø d	L	L <sub>1</sub>		
<b>CMZ01</b> Straight shank Zylinderschaft	-012-G20-SP12-01	○	12	20	100	40	1	0.2
	-025-G25-SP12-02	○	25	25	120	40	2	0.8
	-032-G32-SP12-03	○	32	32	180	40	3	1.1
Weldon shank	-012-XP20-SP12-01	○	12	20	100	40	1	0.2
Weldon Schaft	-025-XP25-SP12-02	○	25	25	120	40	2	0.6
	-032-XP32-SP12-03	○	32	32	180	40	3	1.0

#### ■ Spare parts · Ersatzteile

Diameter Durchmesser Ø D	Screw Schraube	Wrench Schlüssel
Ø12-Ø32	I43M5×11	WT20IS

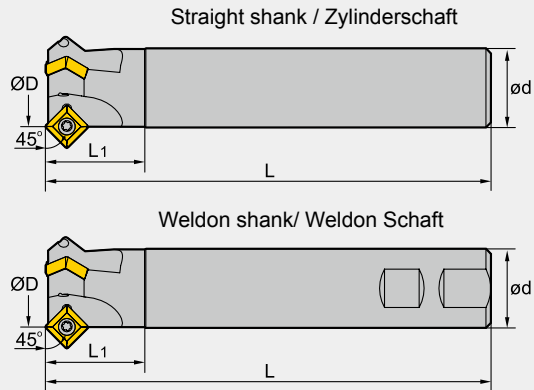


Kr:45°



### Chamfer milling tools · Fasfräser

**CMA01** P M K



### ■ Specification of tools · Werkzeug Beschreibung

Type · Typ	Stock Lager	Dimensions (mm) · Abmessungen				No. of teeth Zähne	Weight Gewicht (kg)	
		Ø D	ø d	L	L <sub>1</sub>			
<b>CMA01</b> Straight shank	●	-012-G20-SP12-01	12	20	100	40	1	0.2
	●	-025-G25-SP12-02	25	25	120	40	2	0.8
	●	-032-G32-SP12-03	32	32	180	40	3	1.1
Zylinder Schaft	●	-032-G32-SP12-03	32	32	180	40	3	1.1
Weldon shank	●	-012-XP20-SP12-01	12	20	100	40	1	0.2
	●	-025-XP25-SP12-02	25	25	120	40	2	0.6
Weldon Schaft	●	-032-XP32-SP12-03	32	32	180	40	3	1.0

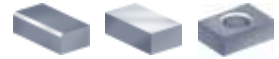
### ■ Spare parts · Ersatzteile

Diameter Durchmesser Ø D	Screw Schraube	Wrench Schlüssel
Ø12-Ø32	I43M5×11	WT20IS



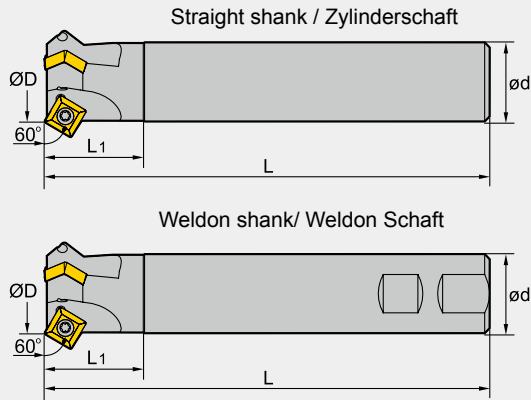
● Ex Stock / ab Lager ○ On demand / auf Anfrage

Kr:60°



### Chamfer milling tools · Fasfräser

**CMD01** P M K



#### ■ Specification of tools · Werkzeug Beschreibung

Type · Typ	Stock Lager	Dimensions (mm) · Abmessungen				No. of teeth Zähne	Weight Gewicht (kg)	
		Ø D	ø d	L	L <sub>1</sub>			
<b>CMD01</b> Straight shank Zylinder Schaft	●	-012-G20-SP12-01	12	20	100	40	1	0.2
	●	-025-G25-SP12-02	25	25	120	40	2	0.8
	●	-036-G32-SP12-03	36	32	180	40	3	1.0
Weldon shank Weldon Schaft	●	-012-XP20-SP12-01	12	20	100	40	1	0.2
	●	-025-XP25-SP12-02	25	25	120	40	2	0.6
	●	-036-XP32-SP12-03	36	32	180	40	3	1.0

#### ■ Spare parts · Ersatzteile · Ersatzteile

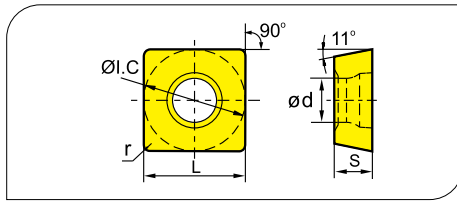
Diameter Durchmesser Ø D	Screw Schraube	Wrench Schlüssel
Ø12-Ø32	I43M5×11	WT20IS



# Milling · Fräsen

## Indexable Milling Tools · Wendepplattenfräser

### Applicable inserts · Wendeschneidplatten



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

Workpiece Material / Werkstoffe	P	M	K	N	S	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
<b>P</b> Steel / Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
<b>M</b> Stainless Steel / Rostfreier Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
<b>K</b> Cast iron / Gusseisen	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
<b>N</b> Non-ferrous material / Ne Metalle	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
<b>S</b> Heat-resistant steel / Warmfester Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating / CVD Beschicht.						PVD Coating / PVD Beschicht.						Cermets		Carbide uncoat. / unbe. Hartmetall			
		I.C	L	r	S	d	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	<b>SPMT120408</b>	12.7	12.7	0.8	4.76	5.5	●	●	●															









### Recommended Cutting data · Schnittdaten









Workpiece material / Werkstückstoff	Hardness HB / Härte	Grade / Sorte	Cutting data · Schnittdaten	
			Cutting speed / Schnittgeschw. (m/min)	Feed speed / Vorschub (mm/z)
<b>P</b> Low-carbon steel / Soft steel / niedrig legierter Kohlenstoffstahl / Baustahl  High-carbon steel / hoch legierter Kohlenstoffstahl / Alloy steel / Leg. Stahl  Alloy tool steel / Leg. Werkzeugstahl	≤180	YBM251 YBC301	180(100—250)	0.25 (0.1-0.4)
		YBM351 YBG302	150(100—200)	0.3 (0.1-0.5)
		YC30S	120(80—150)	0.4 (0.1-0.5)
	180—280	YBM251 YBC301	160(100—220)	0.3 (0.1-0.4)
		YBM351 YBG302	130(100—180)	0.3 (0.1-0.5)
		YC30S	100(60—150)	0.4 (0.1-0.5)
	280—350	YBM251 YBC301	120(80—180)	0.3 (0.1-0.4)
		YBM351 YBG302	100(80—150)	0.3 (0.1-0.5)
		YC30S	80(60—120)	0.4 (0.1-0.5)
<b>M</b> Stainless steel / Rostfreier Stahl	≤270	YBM251 YBC301	120(80—180)	0.3 (0.1-0.4)
		YBM351 YBG302	100(80—150)	0.3 (0.1-0.5)
		YC30S	80(60—120)	0.4 (0.1-0.5)
<b>K</b> Cast iron / Gusseisen	180-250	YBG302	130(100—180)	0.4 (0.1-0.5)








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







### Inserts - face milling · WSP - Planfräsen

							
<b>SEET-CF</b>	<b>SEET-CM</b>	<b>SEET-CR</b>	<b>SEET-DF</b>	<b>SEET-DM</b>	<b>SEET-DR</b>	<b>SEET-EF</b>	<b>SEET-EM</b>
Page Seite	B164	B164	B164	B164	B164	B164	B164

							
<b>SEET-LH</b>	<b>SEET-W</b>	<b>SEK(E)N</b>	<b>SEKR</b>	<b>OFKT-DF</b>	<b>OFKT-DM</b>	<b>OFKT-LH</b>	<b>OFKR-DF</b>
Page Seite	B164	B164	B166	B166	B160	B160	B160









							
<b>OFKR-DM</b>	<b>SNKN</b>	<b>HNEX-DF</b>	<b>HNEX-DM</b>	<b>HNEX-DR</b>	<b>PNEG</b>	<b>LNKT-ZR</b>	<b>LNE32.534</b>
Page Seite	B161	B173	B157	B157	B157	B158	B158

						
<b>LNXC</b>	<b>SPKW</b>	<b>SPKT</b>	<b>SPAN/SPCN</b>	<b>SP*N</b>	<b>SPKR-GM</b>	<b>SPEX</b>
Page Seite	B159	B169	B169	B167	B167/168	B170

					
<b>SPMR</b>	<b>SP*N</b>	<b>TPAN/TPCN/TPKN</b>	<b>TPGN</b>	<b>TPUN</b>	<b>TPMR</b>
Page Seite	B171	B172	B174	B176	B177

				
<b>SEET*PER-PF</b>	<b>SEET*PER-PM</b>	<b>SEET*PER-PR</b>	<b>SEET-LH</b>	<b>RCKT-DM</b>
Page Seite	B165	B165	B165	B165

### Inserts - square shoulder milling · WSP - Eckfräsen

							
<b>RCKT-DR</b>	<b>RDKW</b>	<b>APKT-PF</b>	<b>APKT-PM</b>	<b>APKT-PR</b>	<b>APKT-LH</b>	<b>APMT-PDR</b>	<b>APMT-PDER</b>
Page Seite	B161	B162	B155	B155	B155	B155	B156

# Milling · Fräsen

Indexable Milling Tools · Wendeplattenfräser

## Inserts - square shoulder milling · WSP - Eckfräsen



APET16Q5      APET1604

Page      B156      B156  
Seite

## Inserts for profile milling · WSP - Formfräsen



ZDET      ZPNT      SPMT/SDMT      ROHX      XPHT-GM      ZOHX-GF      ZOHX-GM

Page      B180      B181      B169      B162      B179      B181      B181  
Seite

## Inserts - side and face milling WSP - Seiten und Stirnfräsen



XSEQ      MPHT

Page      B180      B160  
Seite

## Inserts - high feed milling WSP - Hochvorschubfräsen



SDMT-DM      WPGT

Page      B163      B179  
Seite

## Inserts - T-slot milling WSP - T-Nuten Fräsen



MPHT

Page      B160  
Seite

## Inserts - helical milling WSP - Zirkular Fräsen



APKT-PM/KM      SPMT-PM/KM      XEEN      XEEQ

Page      B157      B169      B178      B178  
Seite

## Inserts - chamfer milling WSP - Fasfräsen



SPMT

Page      B169  
Seite





# Milling · Fräsen

Indexable Milling Tools · Wendeplattenfräser

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

Length of cutting edge · Schneidkantenlänge

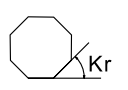
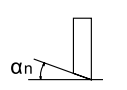


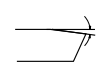
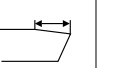





Definition thickness  
Definition dicke

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

Insert thickness · WSP dicke

**12 04 ED T21K R - DM**

Angel · Winkel			
			
<b>A</b>	45°	<b>A</b>	3°
<b>D</b>	60°	<b>B</b>	5°
<b>E</b>	75°	<b>C</b>	7°
<b>F</b>	85°	<b>D</b>	15°
<b>P</b>	90°	<b>E</b>	20°
<b>Z</b>	Others	<b>F</b>	25°
		<b>G</b>	30°
		<b>N</b>	0°
		<b>P</b>	11°
		<b>Z</b>	Others Andere

Chamfer · Fase (mm)			
<b>F</b>			
		0-5°	0-0.10
<b>E</b>		1-10°	1-0.15
		2-15°	2-0.20
<b>T</b>		3-20°	3-0.25
		4-25°	4-0.30
<b>S</b>		5-30°	5-0.35
		6-40°	
		7-45°	
			No mark

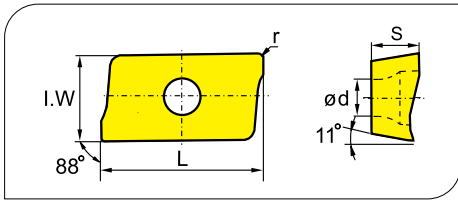
Chipbreaker code  
Spanbrecher

Cutting direction Schnitttrichtung	
<b>R</b>	Right hand
<b>L</b>	Left hand
<b>N</b>	Neutral

# Milling · Fräsen

## Indexable Milling Tools · Wendepplattenfräser

### AP\*\*



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

Workpiece Material / Werkstoffe	P	M	K	N	S
Steel / Stahl	●	●	●	●	●
Stainless Steel / Rostfreier Stahl	●	●	●	●	●
Cast iron / Gusseisen	●	●	●	●	●
Non-ferrous material / Nichte Metalle	●	●	●	●	●
Heat-resistant steel / Warmfester Stahl	●	●	●	●	●

Insert shape Plattenform	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating CVD Beschicht.					PVD Coating PVD Beschicht.					Cermet		Carbide uncoat. unbe. Hartmetall						
		L	I.W	S	d	r	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201	
	APKT11T304-PF	12.24	6.5	3.6	2.8	0.4	○	●	●			●	●												
	APKT11T308-PF	12.24	6.5	3.6	2.8	0.8		●				●													
	APKT11T312-PF	12.24	6.5	3.6	2.8	1.2						○													
	APKT11T316-PF	12.24	6.5	3.6	2.8	1.6						●													
	APKT160408-PF	17.877	9.33	5.76	4.4	0.8	●	●	●			●	●												
	APKT11T304-PM	12.24	6.5	3.6	2.8	0.4	●	●	●	●		●	●	●											
	APKT11T308-PM	12.24	6.5	3.6	2.8	0.8	●	●	●	●		●	●	●											
	APKT11T312-PM	12.24	6.5	3.6	2.8	1.2			●			●													
	APKT11T316-PM	12.24	6.5	3.6	2.8	1.6			●			●													
	APKT160408-PM	17.877	9.33	5.76	4.4	0.8	●	●	●	●	●	●	●	●	●										
	APKT11T304-PR	12.24	6.5	3.6	2.8	0.4		●		●					●										
	APKT11T304-LH	12.24	6.5	3.6	2.8	0.4																	●	●	
	APKT11T308-LH	12.24	6.5	3.6	2.8	0.8																	●	●	
	APKT160408-LH	17.877	9.33	5.76	4.4	0.8																	●	●	

Applicable tool **B9-B15**  
Werkzeug

Inserts code key **B153-B154**  
WSP ISO

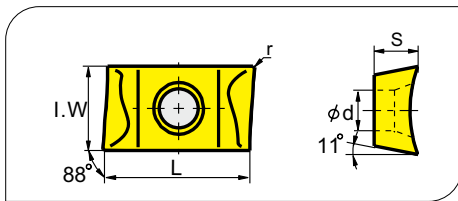
Grade selection guide **B17-23**  
Sortenauswahl

Technical data **B182-B188**  
Technische Daten

# Milling · Fräsen

## Indexable Milling Tools · Wendepplattenfräser

### APET\*\*

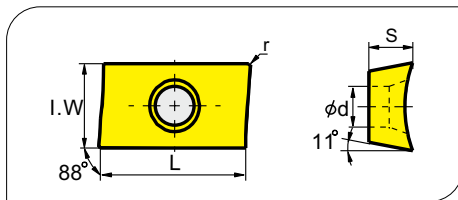


- Ideal Machining Condition / Gute Bearbeitungsbedingungen
- Normal Machining Condition / Normale Bearbeitungsbedingungen
- Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen

Workpiece Material / Werkstoffe	P	M	K	N	S
Steel / Stahl	●	●	●	●	●
Stainless Steel / Rostfreier Stahl	●	●	●	●	●
Cast iron / Gusseisen			●	●	●
Non-ferrite material / Ne Metalle				●	●
Heat-resistant steel / Warmfester Stahl				●	●

Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating / CVD Beschicht.			PVD Coating / PVD Beschicht.			Cermet	Carbide uncoat. unbe. Hartmetall												
		L	I.W	S	d	r	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252			YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	<b>APET16Q508ER</b>	9.525	16.9	5.28	4.4	0.8																				

### APET\*\*

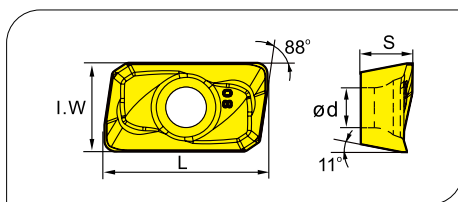


- Ideal Machining Condition / Gute Bearbeitungsbedingungen
- Normal Machining Condition / Normale Bearbeitungsbedingungen
- Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen

Workpiece Material / Werkstoffe	P	M	K	N	S
Steel / Stahl	●	●	●	●	●
Stainless Steel / Rostfreier Stahl	●	●	●	●	●
Cast iron / Gusseisen			●	●	●
Non-ferrite material / Ne Metalle				●	●
Heat-resistant steel / Warmfester Stahl				●	●

Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating / CVD Beschicht.			PVD Coating / PVD Beschicht.			Cermet	Carbide uncoat. unbe. Hartmetall												
		L	I.W	S	d	r	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252			YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	<b>APET1604PDR</b>	9.525	16.9	4.76	4.5	0.86																				

### AP\*\*



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

Workpiece Material / Werkstoffe	P	M	K	N	S
Steel / Stahl	●	●	●	●	●
Stainless Steel / Rostfreier Stahl	●	●	●	●	●
Cast iron / Gusseisen			●	●	●
Non-ferrite material / Ne Metalle				●	●
Heat-resistant steel / Warmfester Stahl				●	●

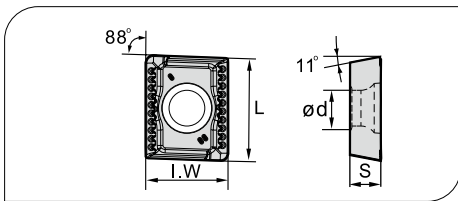
Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating / CVD Beschicht.			PVD Coating / PVD Beschicht.			Cermet	Carbide uncoat. unbe. Hartmetall												
		L	I.W	S	d	r	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252			YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	<b>APMT1135PDR</b>	11.25	6.2	3.5	2.8	0.8			●				○	○	●											
	<b>APMT160408PDER</b>	17.25	9.25	4.76	4.4	0.8							○		●											
	<b>APMT160432PDER</b>	17.25	9.25	4.76	4.4	3.2									○		●									

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

# Milling · Fräsen

## Indexable Milling Tools · Wendepplattenfräser

### AP\*\*

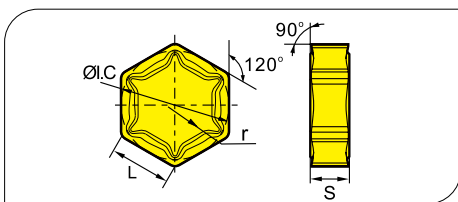


- Ideal Machining Condition / Gute Bearbeitungsbedingungen
- ⊛ Normal Machining Condition / Normale Bearbeitungsbedingungen
- ⊛ Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen

Workpiece Material / Werkstoffe	P	M	K	N	S	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
P Steel / Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
M Stainless Steel / Rostfreier Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
K Cast iron / Gusseisen										●	●	●	●	●	●	●	●	●	●	●	●	●	●
N Non-ferrite material / Ne Metalle																					●	●	●
S Heat-resistant steel / Warmfester Stahl										●	●	●	●	●	●	●	●	●	●	●	●	●	●

Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating / CVD Beschicht.					PVD Coating / PVD Beschicht.					Cermet		Carbide uncoat. unbe. Hartmetall					
		L	I.W	S	d	r	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	APKT150412-PM	16.33	12.7	4.76	5.4	1.2										●	○							
	APKT150412-KM	16.33	12.7	4.76	5.4	1.2										○	●							

### HN\*\*



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

Workpiece Material / Werkstoffe	P	M	K	N	S	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
P Steel / Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
M Stainless Steel / Rostfreier Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
K Cast iron / Gusseisen										●	●	●	●	●	●	●	●	●	●	●	●	●	●
N Non-ferrite material / Ne Metalle																					●	●	●
S Heat-resistant steel / Warmfester Stahl										●	●	●	●	●	●	●	●	●	●	●	●	●	●

Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen				CVD Coating / CVD Beschicht.					PVD Coating / PVD Beschicht.					Cermet		Carbide uncoat. unbe. Hartmetall					
		L	I.C	S	R	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	HNEX090512-DF	9.26	15.875	5.56	1.2																		
	HNEX090512-DM	9.26	15.875	5.56	1.2																		
	HNEX090512-DR	9.26	15.875	5.56	1.2											●	●						

Applicable tool B9-B15  
Werkzeug

Inserts code key B153-B154  
WSP ISO

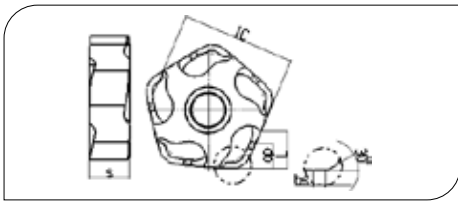
Grade selection guide B17-23  
Sortenauswahl

Technical data B182-B188  
Technische Daten

# Milling - Fräsen

## Indexable Milling Tools - Wendepplattenfräser

### PN\*\*

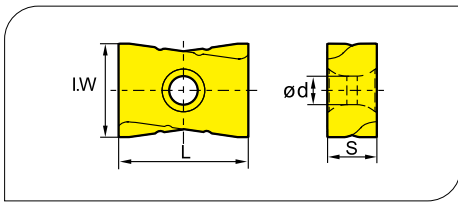


- Ideal Machining Condition / Gute Bearbeitungsbedingungen
- Normal Machining Condition / Normale Bearbeitungsbedingungen
- Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen

Workpiece Material / Werkstoffe	P	M	K	N	S	Steel / Stahl	Stainless Steel / Rostfreier Stahl	Cast iron / Gusseisen	Non-ferrous material / Ne Metalle	Heat-resistant steel / Warmfester Stahl
P	●	●	●	●	●	●	●	●	●	●
M	●	●	●	●	●	●	●	●	●	●
K	●	●	●	●	●	●	●	●	●	●
N	●	●	●	●	●	●	●	●	●	●
S	●	●	●	●	●	●	●	●	●	●

Insert shape / Plattenform	Type · Typ	Dimension (mm) / Abmessung					CVD Coating / CVD Beschicht.					PVD Coating / PVD Beschicht.					Cermet	Carbide uncoat. / unbe. Hartmetall						
		L	I.C	S	bs	ap	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302		YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101
	PNEG110512R-CR	5	15.875	5.56	1.6	4.0					●	●												
	PNEG110512R-CF	5	15.875	5.56	1.6	4.0					○	○												

### LN\*\*

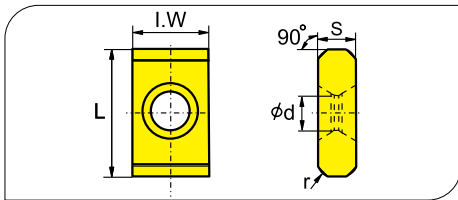


- Ideal Machining Condition / Gute Bearbeitungsbedingungen
- Normal Machining Condition / Normale Bearbeitungsbedingungen
- Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen

Workpiece Material / Werkstoffe	P	M	K	N	S	Steel / Stahl	Stainless Steel / Rostfreier Stahl	Cast iron / Gusseisen	Non-ferrous material / Ne Metalle	Heat-resistant steel / Warmfester Stahl
P	●	●	●	●	●	●	●	●	●	●
M	●	●	●	●	●	●	●	●	●	●
K	●	●	●	●	●	●	●	●	●	●
N	●	●	●	●	●	●	●	●	●	●
S	●	●	●	●	●	●	●	●	●	●

Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating / CVD Beschicht.					PVD Coating / PVD Beschicht.					Cermet	Carbide uncoat. / unbe. Hartmetall						
		L	I.W	S	d	d	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302		YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101
	LNKT1506EN-ZR	15.875	14	6.35	4.6	●		●	●	●	●					●								
	LNKT2007DN-ZR	20	17	7.94	4.6					●	●					●								
	LNKT2510-ZR	25	18	9.525	5.5					●	●					●								

### LN\*\*



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

Workpiece Material / Werkstoffe	P	M	K	N	S	Steel / Stahl	Stainless Steel / Rostfreier Stahl	Cast iron / Gusseisen	Non-ferrous material / Ne Metalle	Heat-resistant steel / Warmfester Stahl
P	●	●	●	●	●	●	●	●	●	●
M	●	●	●	●	●	●	●	●	●	●
K	●	●	●	●	●	●	●	●	●	●
N	●	●	●	●	●	●	●	●	●	●
S	●	●	●	●	●	●	●	●	●	●

Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating / CVD Beschicht.					PVD Coating / PVD Beschicht.					Cermet	Carbide uncoat. / unbe. Hartmetall						
		L	I.W	S	d	r	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302		YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101
	LNE32.534	15.875	9.525	4.76	4.4	1.6					○	○												
	LNE32.302	15.875	9.525	4.76	4.2	45 Fase					○	○												

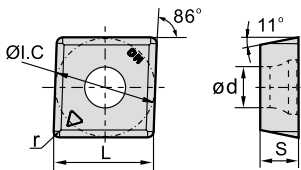
● Ex Stock / ab Lager ○ On demand / auf Anfrage



# Milling · Fräsen

## Indexable Milling Tools · Wendepplattenfräser

### MP\*\*

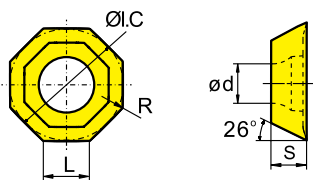


- Ideal Machining Condition / Gute Bearbeitungsbedingungen
- Normal Machining Condition / Normale Bearbeitungsbedingungen
- Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen

Workpiece Material / Werkstoffe	P	M	K	N	S	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
P Steel / Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
M Stainless Steel / Rostfreier Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
K Cast iron / Gusseisen	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
N Non-ferrite material / Ne Metalle	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
S Heat-resistant steel / Warmfester Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating / CVD Beschicht.					PVD Coating / PVD Beschicht.					Cermet		Carbide uncoat. unbe. Hartmetall					
		I.C	L	S	d	r	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	MPHT060304-DM	6.35	6.35	3.18	2.8	0.4			●							●								
	MPHT080305-DM	8.3	8.3	3.18	3.4	0.5			●							○								
	MPHT120408-DM	12.7	12.7	4.76	5.56	0.8			●							●								

### OF\*\*



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

Workpiece Material / Werkstoffe	P	M	K	N	S	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
P Steel / Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
M Stainless Steel / Rostfreier Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
K Cast iron / Gusseisen	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
N Non-ferrite material / Ne Metalle	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
S Heat-resistant steel / Warmfester Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating / CVD Beschicht.					PVD Coating / PVD Beschicht.					Cermet		Carbide uncoat. unbe. Hartmetall					
		L	I.C	S	d	R	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	OFKT05T3-DF	5.26	12.7	3.97	4.4	0.5			●	○			●	●		○								
	OFKT05T3-DM	5.26	12.7	3.97	4.4	0.5			○				●	●		●								
	OFKT05T3-LH	5.26	12.7	3.97	4.4	0.5																	●	

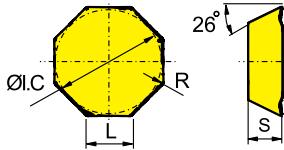
● Ex Stock / ab Lager ○ On demand / auf Anfrage



# Milling - Fräsen

## Indexable Milling Tools - Wendeplattenfräser

### OF\*\*

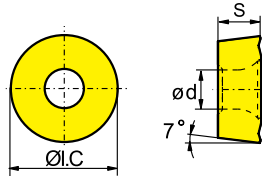


- Ideal Machining Condition / Gute Bearbeitungsbedingungen
- Normal Machining Condition / Normale Bearbeitungsbedingungen
- Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen

Workpiece Material / Werkstoffe	P	M	K	N	S	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
P Steel / Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
M Stainless Steel / Rostfreier Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
K Cast iron / Gusseisen	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
N Non-ferrite material / Ne Metalle	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
S Heat-resistant steel / Warmfester Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen				CVD Coating / CVD Beschicht.						PVD Coating / PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall				
		L	I.C	S	R	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201	
	OFKR0704-DF	7.45	17.94	4.76	0.8			●						●										
	OFKR0704-DM	7.45	17.94	4.76	0.8	●	●	●	●	●	●	●	●	●										
	OFKR0704W-DM	7.45	17.94	4.76		●					●			●										

### RC□□



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

Workpiece Material / Werkstoffe	P	M	K	N	S	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
P Steel / Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
M Stainless Steel / Rostfreier Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
K Cast iron / Gusseisen	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
N Non-ferrite material / Ne Metalle	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
S Heat-resistant steel / Warmfester Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen				CVD Coating / CVD Beschicht.						PVD Coating / PVD Beschicht.						Cermet		Carbide uncoat. unbe. Hartmetall			
		R	I.C	S	d	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	RCKT10T3MO-DM	5	10.0	3.97	4.4	●	●								○								
	RCKT1204MO-DM	6	12.0	4.76	4.0	●	●	●	●	○			○										
	RCKT1204MO-DR	6	12.0	4.76	4.0	●	●	●	●														
	RCKT1606MO-DM	8	16	6.35	5.56	●	●	○							○								
	RCKT1606MO-DR	8	16	6.35	5.56	●	●		●	●													
	RCKT2006MO-DM	8	16	6.35	5.56	●	●																
	RCKT2006MO-DR	10	20	6.35	6.55	●	●		●	●													

Applicable tool **B9-B15**  
Werkzeug

Inserts code key **B153-B154**  
WSP ISO

Grade selection guide **B17-23**  
Sortenauswahl

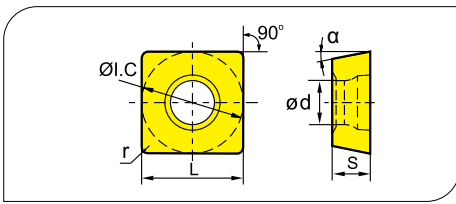
Technical data **B182-B188**  
Technische Daten



# Milling · Fräsen

## Indexable Milling Tools · Wendepplattenfräser

**SD\*\***

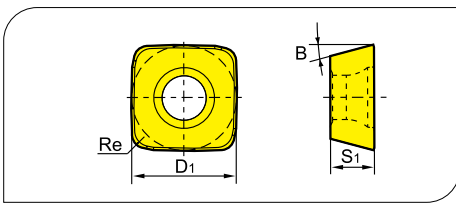


- Ideal Machining Condition / Gute Bearbeitungsbedingungen
- Normal Machining Condition / Normale Bearbeitungsbedingungen
- Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen

Workpiece Material / Werkstoffe	P	M	K	N	S
Steel / Stahl	●	●	●	●	●
Stainless Steel / Rostfreier Stahl	●	●	●	●	●
Cast iron / Gusseisen			●	●	●
Non-ferrous material / Ne Metalle				●	●
Heat-resistant steel / Warmfester Stahl				●	●

Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen						CVD Coating / CVD Beschicht.					PVD Coating / PVD Beschicht.					Cermet	Carbide uncoat. unbe. Hartmetall								
		r	L	I.C	S	d	α	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302		YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201	
	<b>SDMT090308</b>	0.8	9.525	9.525	3.18	4.4	15°		●																		

**SD\*\***



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

Workpiece Material / Werkstoffe	P	M	K	N	S
Steel / Stahl	●	●	●	●	●
Stainless Steel / Rostfreier Stahl	●	●	●	●	●
Cast iron / Gusseisen			●	●	●
Non-ferrous material / Ne Metalle				●	●
Heat-resistant steel / Warmfester Stahl				●	●

Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen				CVD Coating / CVD Beschicht.					PVD Coating / PVD Beschicht.					Cermet	Carbide uncoat. unbe. Hartmetall										
		B	Re	S1	D1	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302		YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201			
	<b>SDMT09T312-DM</b>	15°	1.2	3.97	9.525				●	●			●	●													
	<b>SDMT120412-DM</b>	15°	1.2	4.76	12.7				●	●			●	○													

Applicable tool B9-B15  
Werkzeug

Inserts code key B153-B154  
WSP ISO

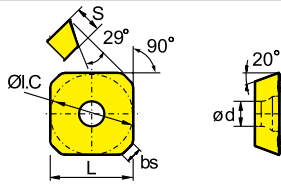
Grade selection guide B17-23  
Sortenauswahl

Technical data B182-B188  
Technische Daten

# Milling · Fräsen

## Indexable Milling Tools · Wendepplattenfräser

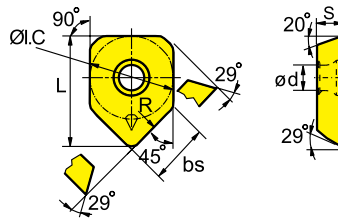
**SE\*\***



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

Workpiece Material / Werkstoffe	P	M	K	N	S
Steel / Stahl	●	●	●	●	●
Stainless Steel / Rostfreier Stahl	●	●	●	●	●
Cast iron / Gusseisen	●	●	●	●	●
Non-ferrous material / Ne Metalle	●	●	●	●	●
Heat-resistant steel / Warmfester Stahl	●	●	●	●	●

Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen						CVD Coating / CVD Beschicht.				PVD Coating / PVD Beschicht.				Cermets		Carbide uncoat. / unbe. Hartmetall							
		L	I.C	S	d	bs	R	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SEET12T3-DF	13.40	13.40	3.97	4.1	2.55		●	●	●				●											
	SEET12T3-CF	13.40	13.40	3.97	4.1	2.55						●		●											
	SEET12T3-EF	13.40	13.40	3.97	4.1	2.55									○		●								
	SEET12T3-DM	13.40	13.40	3.97	4.1	2.55		●	●	●	●														
	SEET12T3-CM	13.40	13.40	3.97	4.1	2.55						●		●											
	SEET12T3-EM	13.40	13.40	3.97	4.1	2.55				●						●									
	SEET12T3-DR	13.40	13.40	3.97	4.1	2.55		●	●		●			○			○								
	SEET12T3-CR	13.40	13.40	3.97	4.1	2.55							●	○											
	SEET12T3-LH	13.40	13.40	3.97	4.1	2.55																	●	●	
	SEET12T3-W	17.82	13.40	3.97	4.1	9.46	500			○		●		●		○									○

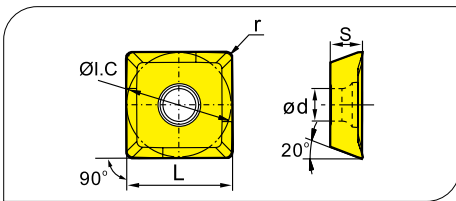


● Ex Stock / ab Lager ○ On demand / auf Anfrage

# Milling · Fräsen

## Indexable Milling Tools · Wendepplattenfräser

**SE\*\***



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

Workpiece Material / Werkstoffe	P	M	K	N	S	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
P Steel / Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
M Stainless Steel / Rostfreier Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
K Cast iron / Gusseisen	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
N Non-ferrous material / Ne Metalle	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
S Heat-resistant steel / Warmfester Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating CVD Beschicht.					PVD Coating PVD Beschicht.					Cermet	Carbide uncoat. unbe. Hartmetall							
		L	I.C	S	d	r	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302		YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SEET09T308PER-PF	9.525	9.525	4.01	3.3	0.8							●												
	SEET09T308PER-PM	9.525	9.525	4.01	3.3	0.8							●												
	SEET09T308PER-PR	9.525	9.525	4.01	3.3	0.8																			
	SEET120308PER-PF	13.308	13.308	4.04	4.1	0.8	●			●			●												
	SEET120308PER-PM	13.308	13.308	4.04	4.1	0.8			●	●	●	●	●	●		●									
	SEET120308PER-PR	13.308	13.308	4.04	4.1	0.8			●	●		●	○	○											
	SEET120308-LH	13.308	13.308	4.04	4.1	0.8							●											●	

Applicable tool [B9-B15](#)  
Werkzeug

Inserts code key [B153-B154](#)  
WSP ISO

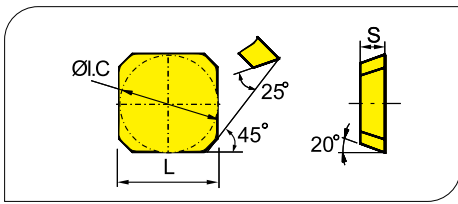
Grade selection guide [B17-23](#)  
Sortenauswahl

Technical data [B182-B188](#)  
Technische Daten

# Milling · Fräsen

## Indexable Milling Tools · Wendepplattenfräser

**SE\*\***

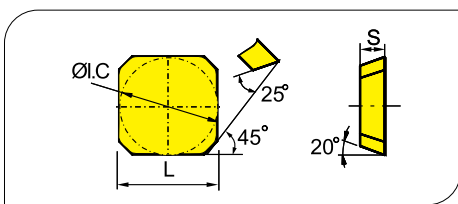


- Ideal Machining Condition / Gute Bearbeitungsbedingungen
- Normal Machining Condition / Normale Bearbeitungsbedingungen
- Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen

Workpiece Material / Werkstoffe	P	M	K	N	S	Steel / Stahl	Stainless Steel / Rostfreier Stahl	Cast iron / Gusseisen	Non-ferrite material / Ne Metalle	Heat-resistant steel / Warmfester Stahl
P	●	●	●	●	●	●	●	●	●	●
M	●	●	●	●	●	●	●	●	●	●
K	●	●	●	●	●	●	●	●	●	●
N	●	●	●	●	●	●	●	●	●	●
S	●	●	●	●	●	●	●	●	●	●

Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen			CVD Coating / CVD Beschicht.					PVD Coating / PVD Beschicht.					Cermet	Carbide uncoat. unbe. Hartmetall						
		L	I.C	S	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302		YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101
	SEEN1203AFTN	12.7	12.7	3.18																		
	SEKN1203AFFN	12.7	12.7	3.18																		
	SEKN1203AFN	12.7	12.7	3.18	●														○		●	
	SEKN1203AFTN	12.7	12.7	3.18	●	●											●		●			●
	SEKN1203AFS13N	12.7	12.7	3.18	○																	
	SEKN1204AFN	12.7	12.7	4.76	●																	●
	SEKN1204AFTN	12.7	12.7	4.76	●																	●
	SEKN1204AFS13N	12.7	12.7	4.76	○																	
	SEKN1504AFN	15.875	15.875	4.76	○																○	○
	SEKN1504AFTN	15.875	15.875	4.76	●	●	●												●			
	SEKN1504AFZN	15.875	15.875	4.76																		
	SEKN1204AZ	15.875	15.875	4.76	●	○																●
	SEKN1504AZ	15.875	15.875	4.76	●	●																●

**SE\*\***



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

Workpiece Material / Werkstoffe	P	M	K	N	S	Steel / Stahl	Stainless Steel / Rostfreier Stahl	Cast iron / Gusseisen	Non-ferrite material / Ne Metalle	Heat-resistant steel / Warmfester Stahl
P	●	●	●	●	●	●	●	●	●	●
M	●	●	●	●	●	●	●	●	●	●
K	●	●	●	●	●	●	●	●	●	●
N	●	●	●	●	●	●	●	●	●	●
S	●	●	●	●	●	●	●	●	●	●

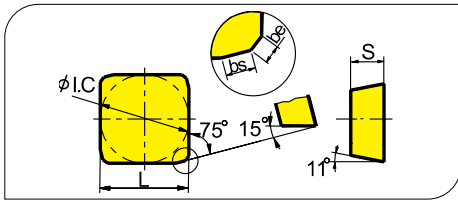
Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen			CVD Coating / CVD Beschicht.					PVD Coating / PVD Beschicht.					Cermet	Carbide uncoat. unbe. Hartmetall						
		L	I.C	S	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302		YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101
	SEKR1203AFN	12.7	12.7	3.18	●	○																
	SEKR1504AFN	15.875	15.875	4.76																		

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

# Milling · Fräsen

## Indexable Milling Tools · Wendeplattenfräser

### SP\*N



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

Workpiece Material / Werkstoffe	P	M	K	N	S
P Steel / Stahl	●	●	●	●	●
M Stainless Steel / Rostfreier Stahl	●	●	●	●	●
K Cast iron / Gusseisen	●	●	●	●	●
N Non-ferrite material / Ne Metalle	●	●	●	●	●
S Heat-resistant steel / Warmfester Stahl	●	●	●	●	●

Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating CVD Beschicht.					PVD Coating PVD Beschicht.					Cermet		Carbide uncoat. unbe. Hartmetall						
		L	I.C	S	be	bs	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201	
	SPAN1203EDEL	12.7	12.7	1.4	1	3.18	○																		
	SPAN1203EDER	12.7	12.7	1.4	1	3.18	○																		
	SPAN1203EDFL	12.7	12.7	1.4	1	3.18																		○	
	SPAN1203EDFR	12.7	12.7	1.4	1	3.18																		●	
	SPAN1203EDL	12.7	12.7	1.4	1	3.18																			○
	SPAN1203EDR	12.7	12.7	1.4	1	3.18																			○
	SPAN1504EDFR	15.875	15.875	1.4	1	4.76																			○
SPAN1504EDFL	15.875	15.875	1.4	1	4.76																			○	
	SPCN1203EDR	12.7	12.7	1.4	1	3.18	○														○				
	SPCN1504EDR	15.875	15.875	1.4	1	4.76	●														○				

Applicable tool **B9-B15**  
Werkzeug

Inserts code key **B153-B154**  
WSP ISO

Grade selection guide **B17-23**  
Sortenauswahl

Technical data **B182-B188**  
Technische Daten

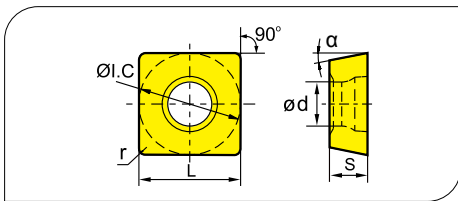




# Milling · Fräsen

## Indexable Milling Tools · Wendeplattenfräser

### SP\*\*

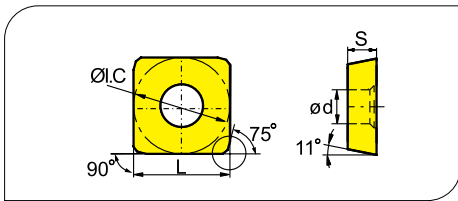


- Ideal Machining Condition / Gute Bearbeitungsbedingungen
- Normal Machining Condition / Normale Bearbeitungsbedingungen
- Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen

Workpiece Material / Werkstoffe	P	M	K	N	S
Steel / Stahl	●	●	●	●	●
Stainless Steel / Rostfreier Stahl	●	●	●	●	●
Cast iron / Gusseisen	●	●	●	●	●
Non-ferrite material / Ne Metalle	●	●	●	●	●
Heat-resistant steel / Warmfester Stahl	●	●	●	●	●

Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen						CVD Coating / CVD Beschicht.					PVD Coating / PVD Beschicht.					Cermet		Carbide uncoat. unbe. Hartmetall					
		r	L	I.C	S	d	α	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SPMT060304-KT	0.4	6.35	6.35	3.18	2.8	11°	○																	
	SPMT060304	0.4	6.35	6.35	3.18	2.8	11°			●															
	SPMT09T308-HT	0.8	9.525	9.525	3.97	4.4	11°	●	●																
	SPMT09T308	0.8	9.525	9.525	3.97	4.4	11°	●	●																
	SPMT120408	0.8	12.7	12.70	4.76	5.5	11°	●	●	●															
	SPMT120408-PM	0.8	12.7	12.70	4.76	5.5	11°										●								
	SPMT120408-KM	0.8	12.7	12.70	4.76	5.5	11°											●							
	SPKT1204EDR	---	12.7	12.7	4.76	5.56	11°										●								

### SP\*W



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

Workpiece Material / Werkstoffe	P	M	K	N	S
Steel / Stahl	●	●	●	●	●
Stainless Steel / Rostfreier Stahl	●	●	●	●	●
Cast iron / Gusseisen	●	●	●	●	●
Non-ferrite material / Ne Metalle	●	●	●	●	●
Heat-resistant steel / Warmfester Stahl	●	●	●	●	●

Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen						CVD Coating / CVD Beschicht.					PVD Coating / PVD Beschicht.					Cermet		Carbide uncoat. unbe. Hartmetall					
		r	L	I.C	S	d	α	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SPKW1204EDFR	---	12.7	12.7	4.76	5.56	11°											●							
	SPKW1204EDSR	---	12.7	12.7	4.76	5.56	11°												●						

Applicable tool B9-B15  
Werkzeug

Inserts code key B153-B154  
WSP ISO

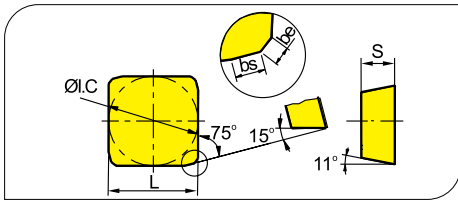
Grade selection guide B17-23  
Sortenauswahl

Technical data B182-B188  
Technische Daten

# Milling · Fräsen

## Indexable Milling Tools · Wendepplattenfräser

### SP\*R

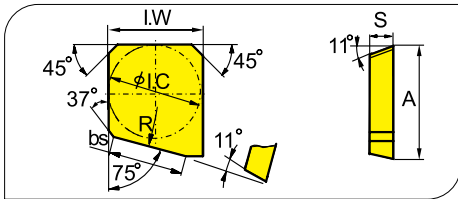


- Ideal Machining Condition / Gute Bearbeitungsbedingungen
- Normal Machining Condition / Normale Bearbeitungsbedingungen
- Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen

Workpiece Material / Werkstoffe	P	M	K	N	S	Steel / Stahl	Stainless Steel / Rostfreier Stahl	Cast iron / Gusseisen	Non-ferrite material / Ne Metalle	Heat-resistant steel / Warmfester Stahl
P	●	●	●	●	●	●	●	●	●	●
M	●	●	●	●	●	●	●	●	●	●
K			●					●		●
N				●					●	
S					●				●	

Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating / CVD Beschicht.					PVD Coating / PVD Beschicht.					Cermet		Carbide uncoat. unbe. Hartmetall					
		L	I.C	S	be	bs	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SPKR1203EDR-GM	12.7	12.7	3.18	1	1.4			○															
	SPKR1203EDL-GM	12.7	12.7	3.18	1	1.4			○															
	SPKR1504EDR-GM	15.875	15.875	4.76	1	1.4			○															
	SPKR1504EDL-GM	15.875	15.875	4.76	1	1.4			○															

### SP\*X



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

Workpiece Material / Werkstoffe	P	M	K	N	S	Steel / Stahl	Stainless Steel / Rostfreier Stahl	Cast iron / Gusseisen	Non-ferrite material / Ne Metalle	Heat-resistant steel / Warmfester Stahl
P	●	●	●	●	●	●	●	●	●	●
M	●	●	●	●	●	●	●	●	●	●
K			●					●		●
N				●					●	
S					●				●	

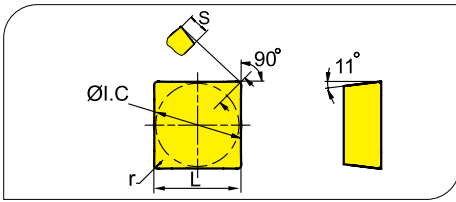
Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen						CVD Coating / CVD Beschicht.					PVD Coating / PVD Beschicht.					Cermet		Carbide uncoat. unbe. Hartmetall						
		A	I.C	I.W	S	bs	R	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201	
	SPEX1203EDL-1	15	12.7	12.7	3.18	10	500																		○	
	SPEX1203EDR-1	15	12.7	12.7	3.18	10	500																			○
	SPEX1504EDL-1	18.2	15.875	15.875	4.76	10	500																			○
	SPEX1504EDR-1	18.2	15.875	15.875	4.76	10	500																			○

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

# Milling · Fräsen

## Indexable Milling Tools · Wendeplattenfräser

**SP\*\***



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

Workpiece Material / Werkstoffe	P	M	K	N	S
<b>P</b> Steel / Stahl	⊗	⊗	⊗	⊗	⊗
<b>M</b> Stainless Steel / Rostfreier Stahl	⊗	⊗	⊗	⊗	⊗
<b>K</b> Cast iron / Gusseisen			⊗	⊗	⊗
<b>N</b> Non-ferrous material / Ne Metalle				⊗	⊗
<b>S</b> Heat-resistant steel / Warmfester Stahl				⊗	⊗

Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen				CVD Coating / CVD Beschicht.						PVD Coating / PVD Beschicht.		Cermet	Carbide uncoat. unbe. Hartmetall									
		L	I.C	s	r	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202		YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	<b>SPMR090304</b>	9.525	9.525	3.18	0.4			●																
	<b>SPMR09T304</b>	9.525	9.525	3.97	0.4			●																
	<b>SPMR090308</b>	9.525	9.525	3.18	0.8			●																
	<b>SPMR120304</b>	12.7	12.7	3.18	0.4			●																
	<b>SPMR120308</b>	12.7	12.7	3.18	0.8			●	●															
	<b>SPMR120312</b>	12.7	12.7	3.18	1.2			●	●															

Applicable tool **B9-B15**  
Werkzeug

Inserts code key **B153-B154**  
WSP ISO

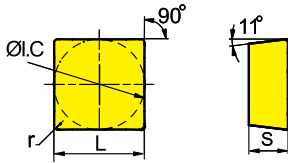
Grade selection guide **B17-23**  
Sortenauswahl

Technical data **B182-B188**  
Technische Daten

# Milling · Fräsen

## Indexable Milling Tools · Wendepplattenfräser

**SP\*\***



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

Workpiece Material / Werkstoffe	P	M	K	N	S
Steel / Stahl	●	●	●	●	●
Stainless Steel / Rostfreier Stahl	●	●	●	●	●
Cast iron / Gusseisen	●	●	●	●	●
Non-ferrous material / Ne Metalle	●	●	●	●	●
Heat-resistant steel / Warmfester Stahl	●	●	●	●	●

Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen				CVD Coating / CVD Beschicht.					PVD Coating / PVD Beschicht.					Cermet		Carbide uncoat. unbe. Hartmetall					
		L	I.C	s	r	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SPUN090304	9.525	9.525	3.18	0.4															●			
	SPUN090308	9.525	9.525	3.18	0.8															●			
	SPUN120304	12.7	12.7	3.18	0.4															●			
	SPUN120308	12.7	12.7	3.18	0.8			●												●			●
	SPUN120312	12.7	12.7	3.18	1.2															●			●
	SPUN150408	15.875	15.875	4.76	0.8															●			●
	SPUN150412	15.875	15.875	4.76	1.2															●			●
	SPUN190408	19.05	19.05	4.76	0.8															●			
	SPUN190412	19.05	19.05	4.76	1.2															●			
	SPUN190416	19.05	19.05	4.76	1.6															●			
	SPGN090304	9.525	9.525	3.18	0.4															●			
	SPGN090308	9.525	9.525	3.18	0.8															●			
	SPGN120304	12.7	12.7	3.18	0.4															●			
	SPGN120308	12.7	12.7	3.18	0.8								●							●			
	SPGN120404	12.7	12.7	4.76	0.4																●		
	SPGN120408	12.7	12.7	4.76	0.8																●		
	SPGN120412	12.7	12.7	4.76	1.2																●		
	SPGN150404	15.875	15.875	4.76	0.4																●		
	SPGN150408	15.875	15.875	4.76	0.8																●		
	SPGN150412	15.875	15.875	4.76	1.2																●		
SPGN190408	19.05	19.05	4.76	0.8																●			
SPGN190416	19.05	19.05	4.76	1.6																●			

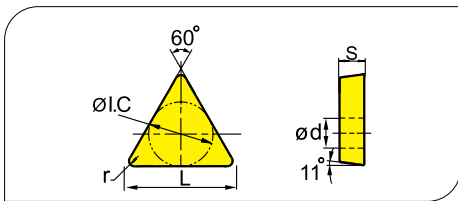
● Ex Stock / ab Lager ○ On demand / auf Anfrage



# Milling · Fräsen

## Indexable Milling Tools · Wendepplattenfräser

**TP\*\***



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

Workpiece Material / Werkstoffe	P	M	K	N	S
Steel / Stahl	●	●	●	●	●
Stainless Steel / Rostfreier Stahl	●	●	●	●	●
Cast iron / Gusseisen	●	●	●	●	●
Non-ferrous material / Ne Metalle	●	●	●	●	●
Heat-resistant steel / Warmfester Stahl	●	●	●	●	●

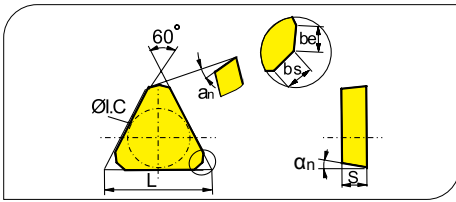
Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen						CVD Coating / CVD Beschicht.					PVD Coating / PVD Beschicht.					Cermet		Carbide uncoat. unbe. Hartmetall								
		L	I.C	bs	be	an	S	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201			
	TPCN1103PPS22PN (TPCN1103PP)	11	6.35	0.7	0.7	11°	3.18																					
	TPCN1603PPS42PN (TPCN1603PP)	16.5	9.525	1.2	1.2	11°	3.18	○							○												○	
	TPCN2204PDRF	22	12.7	1.4	1.4	15°	4.76																					○
	TPCN2204PDRSKR (TPCN2204PDR)	22	12.7	1.4	1.4	15°	4.76	○																				●
	TPCN2204PPEN (TPCN2204PPN)	22	12.7	1.4	1.4	11°	4.76	○																				
	TPAN1103PPS22PN (TPAN1103PP)	11	6.35	0.7	0.7	11°	3.18	○							○													○
	TPAN1603PPS42PN (TPAN1603PP)	16.5	9.525	1.2	1.2	11°	3.18	○							○													○
	TPAN2204PDER (TPAN2204PDR)	22	12.7	1.4	1.4	15°	4.76																					○
	TPAN2204PDRF	22	12.7	1.4	1.4	11°	4.76																					○

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

# Milling · Fräsen

## Indexable Milling Tools · Wendepplattenfräser

**TP\*\***



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

Workpiece Material / Werkstoffe	P	M	K	N	S
Steel / Stahl	●	●	●	●	●
Stainless Steel / Rostfreier Stahl	●	●	●	●	●
Cast iron / Gusseisen	●	●	●	●	●
Non-ferrous material / Ne Metalle	●	●	●	●	●
Heat-resistant steel / Warmfester Stahl	●	●	●	●	●

Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen						CVD Coating CVD Beschicht.					PVD Coating PVD Beschicht.					Cermet	Carbide uncoat. unbe. Hartmetall							
		L	I.C	S	be	bs	an	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302		YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	TPKN1603PDSKR (TPKN1603PDR)	16.5	9.525	3.18	1.2	1	15°	●	●	○	○			○	●	●	○					●				
	TPKN1603PDSKL (TPKN1603PDL)	16.5	9.525	3.18	1.2	1	11°																			
	TPKN1603PPER (TPKN1603PPR)	16.5	9.525	3.18	1.2	1	11°	●	○														●			
	TPKN1603PPFR (TPKN1603PPR)	22	12.7	4.76	1.4	0.7	11°								○											●
	TPKN2204PDSKR (TPKN2204PDR)	22	12.7	4.76	1.4	0.7	11°	●	●						●	●	●	○					●			
	TPKN2204PPS22PL (TPKN2204PDL)	22	12.7	4.76	1.4	0.7	11°	●															●			
	TPKN2204PDS41PR (TPKN2204PDTR)	22	12.7	4.76	1.4	0.7	11°	○							○								●			

(old Materialnr. / alte Artikelnr.)

Applicable tool **B9-B15**  
Werkzeug

Inserts code key **B153-B154**  
WSP ISO

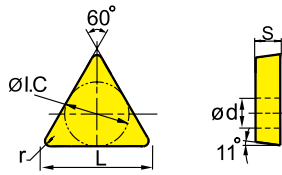
Grade selection guide **B17-23**  
Sortenauswahl

Technical data **B182-B188**  
Technische Daten

# Milling · Fräsen

## Indexable Milling Tools · Wendeplattenfräser

**TP\*\***



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

Workpiece Material / Werkstoffe	P	M	K	N	S
Steel / Stahl	●	●	●	●	●
Stainless Steel / Rostfreier Stahl	●	●	●	●	●
Cast iron / Gusseisen			●		●
Non-ferrous material / Ne Metalle				●	●
Heat-resistant steel / Warmfester Stahl				●	●

Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen				CVD Coating / CVD Beschicht.					PVD Coating / PVD Beschicht.					Cermet		Carbide uncoat. unbe. Hartmetall					
		L	I.C	s	r	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	TPGN090204	9.6	5.56	2.38	0.4																		
	TPGN090208	9.6	5.56	2.38	0.8																		
	TPGN110204	11	6.35	2.38	0.4																		
	TPGN110304	11	6.35	3.18	0.4																		
	TPGN110308	11	6.35	3.18	0.8																		
	TPGN160304	16.5	9.525	3.18	0.4																	●	
	TPGN160308	16.5	9.525	3.18	0.8																		●
	TPGN160312	16.5	9.525	3.18	1.2																		
	TPGN160316	16.5	9.525	3.18	1.6																		
	TPGN220308	22	12.7	4.76	0.8																		
	TPGN220404	22	12.7	4.76	0.4																		
	TPGN220408	22	12.7	4.76	0.8																		
	TPGN220412	22	12.7	4.76	1.2																		
TPGN270408	27.5	15.875	4.76	0.8																			

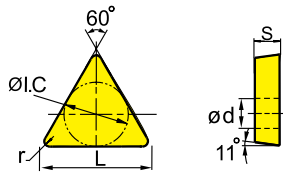
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# Milling · Fräsen

## Indexable Milling Tools · Wendeplattenfräser

### TP\*\*



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

Workpiece Material / Werkstoffe	P	M	K	N	S
Steel / Stahl					
Stainless Steel / Rostfreier Stahl					
Cast iron / Gusseisen					
Non-ferrous material / Ne Metalle					
Heat-resistant steel / Warmfester Stahl					

Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen				CVD Coating CVD Beschicht.					PVD Coating PVD Beschicht.					Cermet		Carbide uncoat. unbe. Hartmetall					
		L	I.C	s	r	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	TPUN110208	11	6.35	2.38	0.8																		
	TPUN110304	11	6.35	3.18	0.4			●												●			
	TPUN110308	11	6.35	3.18	0.8			●												●			
	TPUN160304	16.5	9.525	3.18	0.4			●												●			●
	TPUN160308	16.5	9.525	3.18	0.8			●	●											●			
	TPUN160312	16.5	9.525	3.18	1.2			●												●			●
	TPUN160408	16.5	9.525	4.76	0.8																		
	TPUN160412	16.5	9.525	4.76	1.2																		
	TPUN220404	22	12.7	4.76	0.4															●			
	TPUN220408	22	12.7	4.76	0.8				●											●			
	TPUN220412	22	12.7	4.76	1.2					●													●
	TPUN220416	22	12.7	4.76	1.6																		
	TPMR090204	9.6	5.56	2.38	0.4			●															
	TPMR110304	11	6.35	3.18	0.4			●															
	TPMR110308	11	6.35	3.18	0.8			●															
	TPMR160304	16.5	9.525	3.18	0.4			●	●											●			
	TPMR160308	16.5	9.525	3.18	0.8			●	●											●			
	TPMR160312	16.5	9.525	3.18	1.2			●	●														
	TPMR220412	22	12.7	4.76	1.2			●															
	TPMR330916	33	19.05	9.52	1.6																		

Applicable tool [B9-B15](#)  
Werkzeug

Inserts code key [B153-B154](#)  
WSP ISO

Grade selection guide [B17-23](#)  
Sortenauswahl

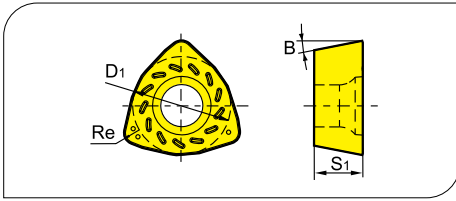
Technical data [B182-B188](#)  
Technische Daten



# Milling · Fräsen

## Indexable Milling Tools · Wendepplattenfräser

### Applicable inserts · Wendeschneidplatten

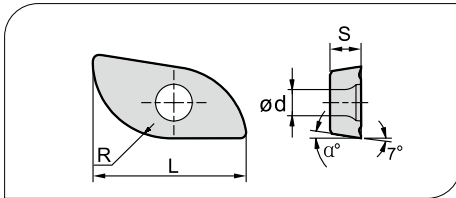


- Ideal Machining Condition / Gute Bearbeitungsbedingungen
- Normal Machining Condition / Normale Bearbeitungsbedingungen
- Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen

Workpiece Material / Werkstoffe	P	M	K	N	S	Machining Conditions														
						1	2	3	4	5	6	7	8	9	10					
P Steel / Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
M Stainless Steel / Rostfreier Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
K Cast iron / Gusseisen																				
N Non-ferrite material / Ne Metalle																				
S Heat-resistant steel / Warmfester Stahl																				

Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen				CVD Coating / CVD Beschicht.					PVD Coating / PVD Beschicht.					Cermets		Carbide uncoat. unbe. Hartmetall						
		B	Re	S1	D1	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201	
	WPGT050315ZSR	11°	1.5	3.5	7.94				●															
	WPGT060415ZSR	11°	1.5	4.2	9.525				●															
	WPGT080615ZSR	11°	1.5	6.35	12.85				●				●											
	WPGT090725ZSR	11°	2.5	7	15				●															

### XP\*\*



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

Workpiece Material / Werkstoffe	P	M	K	N	S	Machining Conditions																	
						1	2	3	4	5	6	7	8	9	10								
P Steel / Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
M Stainless Steel / Rostfreier Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
K Cast iron / Gusseisen																							
N Non-ferrite material / Ne Metalle																							
S Heat-resistant steel / Warmfester Stahl																							

Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen					CVD Coating / CVD Beschicht.					PVD Coating / PVD Beschicht.					Cermets		Carbide uncoat. unbe. Hartmetall					
		R	d	S	α°	L	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	XPHT16R0803-GM	8	3.1	3.18	9	16									●									
	XPHT20R10T3-GM	10	4.0	3.97	9	20									●									
	XPHT25R1204-GM	12.5	4.7	4.76	9	25									●									
	XPHT30R1506-GM	15	5.8	6.35	11	30									●									
	XPHT32R1606-GM	16	5.8	6.35	9	32									●									
	XPHT40R2007-GM	20	6.8	7.94	9	40										○								
	XPHT50R2507-GM	25	9.2	7.94	9	50										○								

Applicable tool B9-B15  
Werkzeug

Inserts code key B153-B154  
WSP ISO

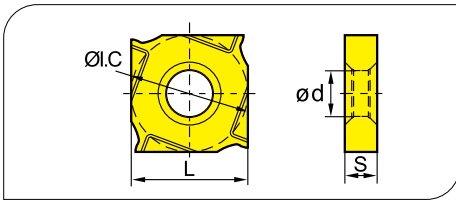
Grade selection guide B17-23  
Sortenauswahl

Technical data B182-B188  
Technische Daten

# Milling · Fräsen

## Indexable Milling Tools · Wendepplattenfräser

### XS\*\*

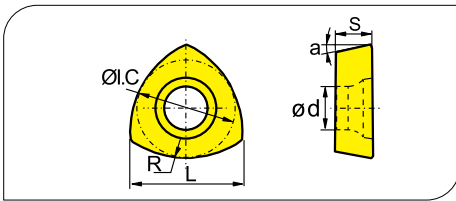


- Ideal Machining Condition / Gute Bearbeitungsbedingungen
- Normal Machining Condition / Normale Bearbeitungsbedingungen
- Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen

Workpiece Material / Werkstoffe	P	M	K	N	S	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
P Steel / Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
M Stainless Steel / Rostfreier Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
K Cast iron / Gusseisen										●	●	●				●	●				●	●	●
N Non-ferrite material / Ne Metalle																					●	●	●
S Heat-resistant steel / Warmfester Stahl										●	●	●											

Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen				CVD Coating / CVD Beschicht.						PVD Coating / PVD Beschicht.				Cermet		Carbide uncoat. unbe. Hartmetall						
		I.C	L	S	d	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201	
	XSEQ1202	12.7	12.7	2.3	5.0																			
	XSEQ1203	12.7	12.7	3.0	5.0										○									
	XSEQ12T3	12.7	12.7	3.5	5.0	○									○									
	XSEQ1204	12.7	12.7	4.0	5.0										○									
	XSEQ12T4	12.7	12.7	4.5	5.0																			

### ZD\*\*



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

Workpiece Material / Werkstoffe	P	M	K	N	S	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
P Steel / Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
M Stainless Steel / Rostfreier Stahl	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
K Cast iron / Gusseisen										●	●	●				●	●				●	●	●
N Non-ferrite material / Ne Metalle																					●	●	●
S Heat-resistant steel / Warmfester Stahl										●	●	●											

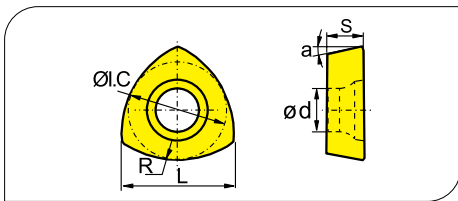
Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen						CVD Coating / CVD Beschicht.						PVD Coating / PVD Beschicht.				Cermet		Carbide uncoat. unbe. Hartmetall				
		I.C	L	S	R	d	α	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101
	ZDET08T2CYR10	6.75	8.4	2.78	10	2.8	14°			●														
	ZDET1103CYR12.5	8.5	10.6	3.18	12.5	2.8	14°			●														
	ZDET13T3CYR16	10.5	13.2	3.97	16	4.4	14°																	
	ZDET13T3CYR16-PM	10.5	13.2	3.97	16	4.4	14°			●														

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

# Milling - Fräsen

## Indexable Milling Tools - Wendepplattenfräser

### ZP\*\*

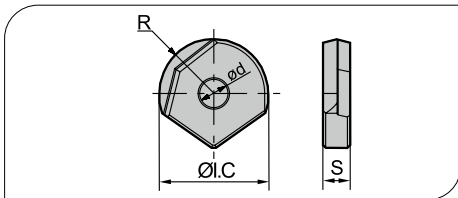


- Ideal Machining Condition / Gute Bearbeitungsbedingungen
- Normal Machining Condition / Normale Bearbeitungsbedingungen
- Unfavorable Machining Condition / Ungünstige Bearbeitungsbedingungen

Workpiece Material / Werkstoffe	P	M	K	N	S	Steel / Stahl	Stainless Steel / Rostfreier Stahl	Cast iron / Gusseisen	Non-ferrite material / Ne Metalle	Heat-resistant steel / Warmfester Stahl
P	●	●	●	●	●	●	●	●	●	●
M	●	●	●	●	●	●	●	●	●	●
K	●	●	●	●	●	●	●	●	●	●
N	●	●	●	●	●	●	●	●	●	●
S	●	●	●	●	●	●	●	●	●	●

Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen						CVD Coating / CVD Beschicht.					PVD Coating / PVD Beschicht.				Cermet		Carbide uncoat. unbe. Hartmetall							
		I.C	L	S	R	d	α	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201	
	ZPNT2204CY(R20)	12.7	16.1	4.76	20	5.56	11°			○																
	ZPNT2204CY(R25)	12.7	16.9	4.76	25	5.56	11°			●																
	ZPNT2204CY(R31)	12.7	17.6	4.76	31.5	5.56	11°			●																

### ZO\*\*



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

Workpiece Material / Werkstoffe	P	M	K	N	S	Steel / Stahl	Stainless Steel / Rostfreier Stahl	Cast iron / Gusseisen	Non-ferrite material / Ne Metalle	Heat-resistant steel / Warmfester Stahl
P	●	●	●	●	●	●	●	●	●	●
M	●	●	●	●	●	●	●	●	●	●
K	●	●	●	●	●	●	●	●	●	●
N	●	●	●	●	●	●	●	●	●	●
S	●	●	●	●	●	●	●	●	●	●

Insert WSP	Type · Typ	Dimensions (mm) · Abmessungen				CVD Coating / CVD Beschicht.						PVD Coating / PVD Beschicht.				Cermet		Carbide uncoat. unbe. Hartmetall							
		R	I.C	S	d	YBC301	YBC401	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201		
	ZOHX1203-GF	6	12	3	4												●								
	ZOHX1604-GF	8	16	4	5													●							
	ZOHX2005-GF	10	20	5	5													●							
	ZOHX2506-GF	12.5	25	6	6													●							
	ZOHX3007-GF	15	30	7	8													●							
	ZOHX3207-GF	16	32	7	8													●							
	ZOHX1203-GM	6	12	3	4												●								
	ZOHX1604-GM	8	16	4	5												●								
	ZOHX2005-GM	10	20	5	5												●								
	ZOHX2506-GM	12.5	25	6	6												●								
	ZOHX3007-GM	15	30	7	8												●								
	ZOHX3207-GM	16	32	7	8												●								

Applicable tool B9-B15  
Werkzeug

Inserts code key B153-B154  
WSP ISO

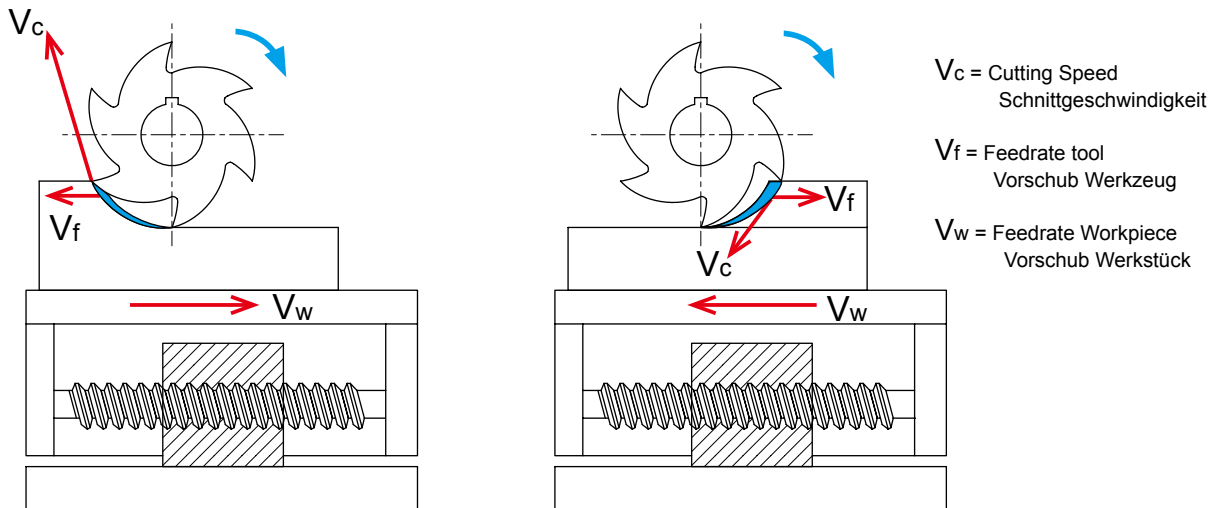
Grade selection guide B17-23  
Sortenauswahl

Technical data B182-B188  
Technische Daten

# Milling · Fräsen

Indexable Milling Tools · Wendeplattenfräser

## Difference and selection between down milling and up milling Unterschied zwischen Gleichlauf- und Gegenlauf



**Up milling  
Gegenlaufräsen**

**Down milling  
Gleichlaufräsen**

1. Down milling (climb milling): the feed direction of workpiece is the same as that of the milling rotation at the connecting position.

2. Up milling (conventional milling): the feed direction of workpiece is opposite to that of the milling rotation at the connecting position

1. Beim Gleichlaufräsen sind die Drehrichtung des Fräswerkzeuges und die Vorschubrichtung des Werkstückes gleich gerichtet.


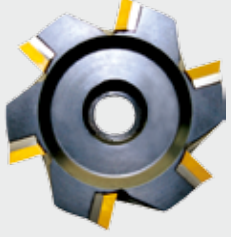

2. Beim Gegenlaufräsen ist die Drehrichtung des Fräswerkzeuges und die Vorschubrichtung des Werkstückes entgegengesetzt.

### Advantage and Disadvantage · Vor- und Nachteile:

Direction Richtung	Advantage Vorteil	Disadvantage Nachteil
Up milling Gegenlaufräsen	Prevent hooking of tool, more smooth cut Verhindert das Einhaken des Werkzeuges, ruhigerer Lauf	Bigger stress on cutting edge, tool life shorter Größere Belastung für den Schneidstoff, kürzere Standzeiten
Down milling Gleichlaufräsen	Higher tool life, less thermal stress Höhere Standzeiten, weniger thermische Belastung	Hooking of tool possible Einhaken des Werkzeuges möglich

### Pitch selection · Fräserteilung

Pitch is the distance between one point on one cutting edge and the same point on the next edge. Milling cutters are mainly classified into coarse, close and extra close pitches, Als Fräserteilung wird der Abstand von einer Schneidenecke zur nächsten Schneidenecke bezeichnet. Die Einteilung erfolgt in weite (differential), enge und extra enge Teilung.

Operational stability · Bearbeitungsstabilität		
<b>L</b> (Low/ Niedrig)	<b>M</b> (Medium/ Mittel)	<b>H</b> (High/Hoch)
<p><b>Coarse pitch · weite Teilung</b></p>  <p>(Differential pitch)</p>	<p><b>Close pitch · Enge Teilung</b></p> 	<p><b>Extra close pitch Extra Enge Teilung</b></p> 
<p>When the milling width equal to diameter of cutter, the machining system is stable and main power of machine is sufficient, selecting coarse pitch can achieve high productive efficiency.</p> <p>Ist die Fräsbreite gleich dem Fräserdurchmesser, die Maschinen in sich stabil, und mit genügend Leistung, wird eine weite Teilung verwendet, um eine hohe Produktivität zu erreichen.</p>	<p>General milling function and multiple mixed productions</p> <p>Erste Wahl für allgemeine Fräsbearbeitung und Mischbearbeitung</p>	<p>When the milling width is less than diameter of cutter, cutting by maximum edges can achieve high productive efficiency.</p> <p>Ist die Fräsbreite kleiner als der Fräserdurchmesser, ermöglicht eine große Schneidenanzahl eine hohe Produktivität. Für alle Materialien geeignet, besonders auch bei hochwarmfesten Werkstoffen.</p>

### Selection of approach angle · Einstellwinkel

The approach angle is composed by insert and tool body, Chip thickness, cutting forces and tool-life are affected especially by the approach angle. Decreasing the approach angle reduces chip thickness and spreads the cutting area between cutting edge and workpiece for a given feed rate.

A smaller approach angle also guarantee that it is stable entering into or exiting workpiece, to protect the cutting edge and extend tool life. However this will increase higher axial cutting forces on the workpiece, thus is not suitable for machining thin workpiece such as thin plate.

Approach angle Einstellwinkel	Feed rate per tooth Zahnvorschub	Real max. cutting depth Max. Spandicke
90°	$f_z$	$h_{ex}=f_z \times \text{sinkr}$
75°	$f_z$	$h_{ex}=0.96 \times f_z$
60°	$f_z$	$h_{ex}=0.86 \times f_z$
45°	$f_z$	$h_{ex}=0.707 \times f_z$
Round insert	$f_z$	$h_{ex} = \frac{\sqrt{i C^2 \times (i C - 2 a_p)^2}}{i C} \times f_z$

Der Einstellwinkel eines Planfräasers steht in Verbindung mit der Spandicke. Dies ist der Winkel zwischen der Hauptschneide der Wendeschneidplatte und der Werkstückoberfläche. Spandicke, Schnittkräfte und Standzeit werden insbesondere durch den Einstellwinkel beeinflusst. Durch Verringern des Einstellwinkels wird die Spandicke bei einer gegebenen Vorschubrate kleiner. Dieser Effekt führt dazu, dass sich die Werkstückstoffmenge über einen größeren Teil der Schneidkante verteilt. Ein kleiner Einstellwinkel sorgt auch für einen weniger abrupten Eintritt in den Schnitt, wodurch der radiale Druck sinkt und die Schneidkante geschont wird. Die höheren axialen Kräfte verstärken jedoch den Druck auf das Werkstück. Für die Bearbeitung von dünnwandigen Bauteilen nicht geeignet.

# Milling · Fräsen

Indexable Milling Tools · Wendeplattenfräser

## General formula · Allgemeine Formeln

$V_c$ : cutting speed (m/min)  
Schnittgeschwindigkeit (m/min)

$D_c$ : nominal diameter of milling tool (mm)  
Sollmaß von Fräswerkzeugen (mm)

$n$ : spindle speed (rev/min)  
Umdrehungsgeschwindigkeit (u/min)

$z_n$ : number of teeth  
Zähne Anzahl

$Q$ : metal removal rate (cm<sup>3</sup>/min)  
Material Abtragsrate (cm<sup>3</sup>/min)

$V_f$ : feed rate of worktable (feed speed) (mm/min)  
Vorschub der Maschinentisch (feed speed) (mm/min)

$f_z$ : feed rate per tooth (mm/z)  
Zahnvorschub (mm/z)

$\pi$ : circumference ratio ≈ 3.14  
Kreiszahl ~3,4

$T_c$ : machining time (min)  
Maschinen Zeit (min)

$f_n$ : feed rate per revolution (mm/rev)  
Vorschub pro Umdrehung (mm/u)

- Cutting speed · Schnittgeschwindigkeit

$$V_c = \frac{\pi \times D_c \times n}{1000} \text{ (m/min)}$$

- Spindle speed · Umdrehungsgeschwindigkeit

$$n = \frac{1000 \times V_c}{\pi \times D_c} \text{ (rev/min)}$$

- Feed rate of worktable ( feed speed)

- Vorschub des Maschinentisch

$$V_f = f_z \times n \times z_n \text{ (mm/min)}$$

- Feed rate per tooth · Zahnvorschub

$$f_z = \frac{V_f}{n \times z_n} \text{ (mm/z)}$$

- Feed rate per revolution · Vorschub pro Umdrehung

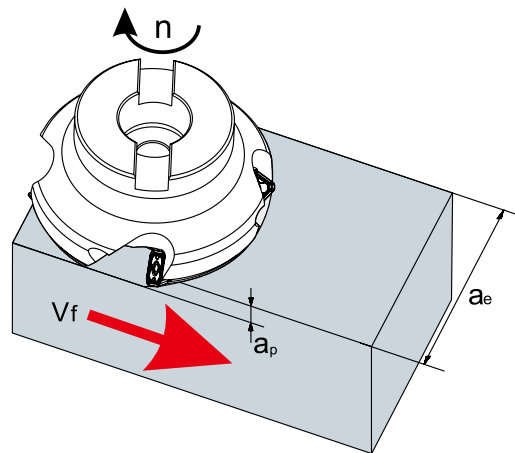
$$f_n = \frac{V_f}{n} \text{ (mm/rev)}$$

- Machining time · Bearbeitungszeit

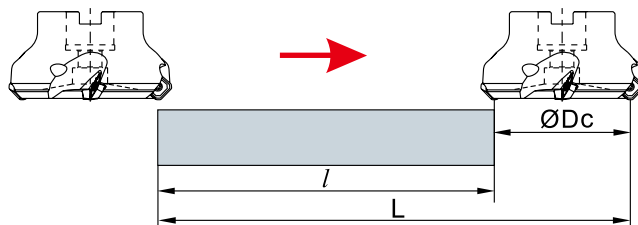
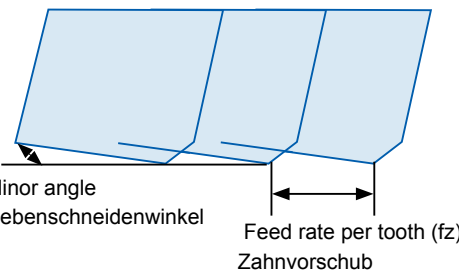
$$T_c = \frac{1000 \times V_c}{\pi \times D_c} \text{ (min)}$$

- Metal removal rate · Zerspanungsvolumen

$$Q = \frac{a_p \times a_e \times V_f}{1000} \text{ (cm}^3\text{/min)}$$

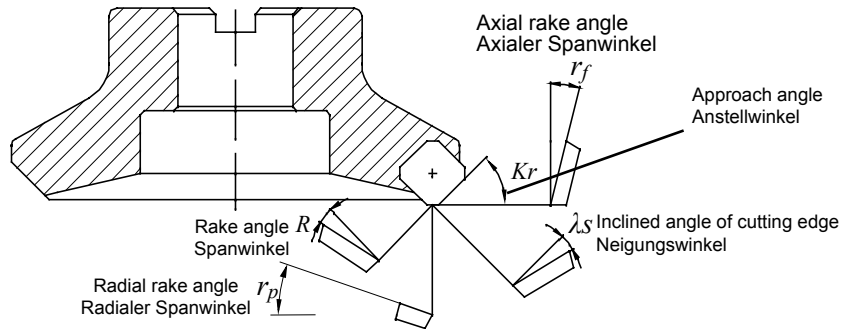


Feed direction  
Vorschubsrichtung





### Function of each part in face milling · Winkelfunktion beim Planfräsen



#### Main angles of face mills · Winkel beim Planfräsen

Designation Winkel	Function Funktion	Effect Auswirkung		
Axial rake angle Axialer Spanwinkel $r_f$	Determining the chip direction Beeinflusst die Spanflußrichtung	negative angle, excellent chip removal Negativer <Spanwinkel, gute Späneabfuhr		
Radial rake angle Radialer Spanwinkel $r_p$	Determining sharpness of cutting edge Definiert die Schneidenschärfe	Positive angle, good cutting performance Positiver Winkel, gute Schnittleistung		
Approach angle Anstellwinkel $Kr$	Determining the chip thickness Beeinflusst die Spandicke	$Kr \uparrow$ , chip thickness $\uparrow$ ; $Kr \downarrow$ , chip thickness $\downarrow$ ; $Kr \uparrow$ , Spandicke $\uparrow$ ; $Kr \downarrow$ , Spandicke $\downarrow$ ;		
Rake angle Spanwinkel $R$	Determining true sharpness of cutting edge Beeinflusst die wahre Plattenschärfe	Poor cutting performance, high strength of cutting edge Schlechte Schnittleistung, starke Schneidkante	(-) $\leftarrow$ 0 $\rightarrow$ (+)	Good cutting performance, low strength of cutting edge Schlechte Schnittleistung, starke Schneidkante
Inclined angle of cutting edge Neigungswinkel $\lambda_s$	Determining the chip flow direction Beeinflusst die Spanflußrichtung	Poor cutting performance, high strength of cutting edge Gute Schnittleistung, schwächere Schneidkante	(-) $\leftarrow$ 0 $\rightarrow$ (+)	Good cutting performance, low strength of cutting edge Gute Schnittleistung, schwächere Schneidkante

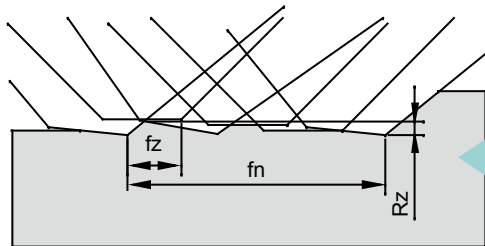
#### Combination of different rake angles · Kombination von verschiedenen Spanwinkeln

Negative rake angle Negativer Spanwinkel		Double positive Doppelt Positiv	Double negative Doppelt Negativ	One pos., one neg. Positiv/Negativ
0° rake angle Neutraler Winkel				
Positive rake angle Positiver Spanwinkel				
Axial rake angle $r_f$ / axialer SW		+	-	+
Radial rake angle $r_p$ radialer SW		+	-	-
Applicable material machined Anwendungsbereich	<b>P</b>	√		√
	<b>M</b>	√		√
	<b>K</b>		√	√
	<b>N</b>	√		
	<b>S</b>	√		√

### ■ Cutting performances of different approach angles

Approach angle Anstellwinkel	Schematic diagram Darstellung	Instruction Erklärung
45°		<p>Axial force is largest. It will bend when machining thin-wall workpiece, and reduces the precision of workpiece. It is benefit to avoid fringe breakage of workpiece when machining cast iron</p> <p>Die axiale Kraft ist sehr hoch. Wegen der Verbiegung nicht geeignet für die Bearbeitung von dünnwandigen Bauteilen. Optimal für die Planbearbeitung von Stahl, Guss und rostfreien Materialien.</p>
75°		<p>The main purpose is to resolve the radial cutting force, it is often used for general face milling.</p> <p>Zur Reduzierung der radialen Kräfte. Für die allgemeine Planbearbeitung.</p>
90°		<p>The axial force is zero in theory, suitable for milling thin plate workpiece.</p> <p>Die axiale Kraft ist nahezu null. Für die Zerspaltung von dünnen, labilen Werkstücken geeignet.</p>

### Wiper insert · Wiper Platte



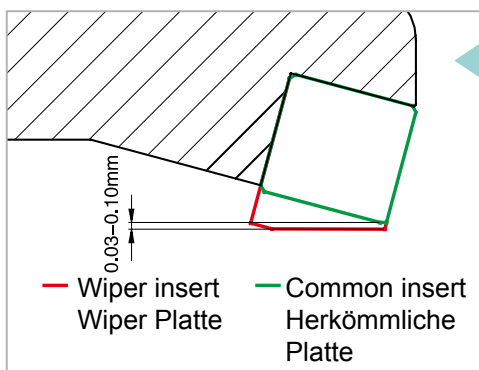
Required Surface roughness with common insert isn't good.

Geforderte Oberflächengüte mit herkömmlichen Platten wird nicht erreicht.

### Solution · Lösung

Assembling wiper inserts  
Einsatz von Wiper Platten

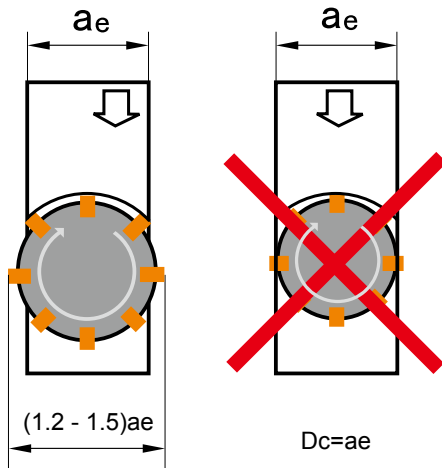
### usage · Anwendung



The wiper insert must protrude below the other inserts by 0.03-0.10 mm at axial direction, only that the wiping function can take into effect.  
Generally speaking, a cutter can just assemble only one wiper insert. If the diameter of cutter is much bigger or cutter's feed rate per revolution is bigger than the length of wiper edge, 2 to 3 wiper inserts can be assembled.

Die Wiperplatte muss ca. 0,03 – 0,1 mm über den normalen Platten in axialer Richtung stehen, um den Wipereffekt zu erreichen.  
Bei Standarddurchmessern reicht eine Wiperplatte.  
Bei sehr großen Fräserdurchmessern oder großen Vorschubraten können bis zu 3 Wiperplatten eingesetzt werden.

- Selection of cutting width and tool cutting diameter in face milling  
Schnittbreiten Auswahl und Werkzeug Durchmesser beim Planfräsen



Generally speaking, the relation between cutting width and tool cutting diameter is  $D_c = (1.2 - 1.5) a_e$ . In the machining practice, it need to avoid coincidence of tool center and workpiece center as much as possible.

In der allgemeinen Anwendung sollte der Fräserdurchmesser 1.2 – 1,5 mal  $a_e$  betragen.  
Positionieren Sie den Fräser leicht außermittig.

$D_c$ : Diameter of milling tool · Werkzeugdurchmesser  
 $a_e$ : Cutting width · Seitliche Zustellung

