Indexable Milling Tools

Catalogue

Milling

2022

ZCC Cutting Tools Europe GmbH

your Partner \ your Value

WELCOME TO ZCC CUTTING TOOLS EUROPE

ZCC-CT, one of the World's leading carbide tooling manufacturers, welcomes you to its products. We are able to offer you a wide product range of high performance cutting tools at economic prices and a good supply service to support the production and productivity at your manufacturing facilities. You will find the main tool types in the various sections of the catalogue, Turning is in section A, Milling in section B and Drilling in section C of the catalogue.

We are looking forward to working with you and developing good cooperation together. Our team at ZCC Cutting Tools Europe is ready to support you in all of your requirements.

Member of Minmetals Group

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MC 734/MT
STAMA

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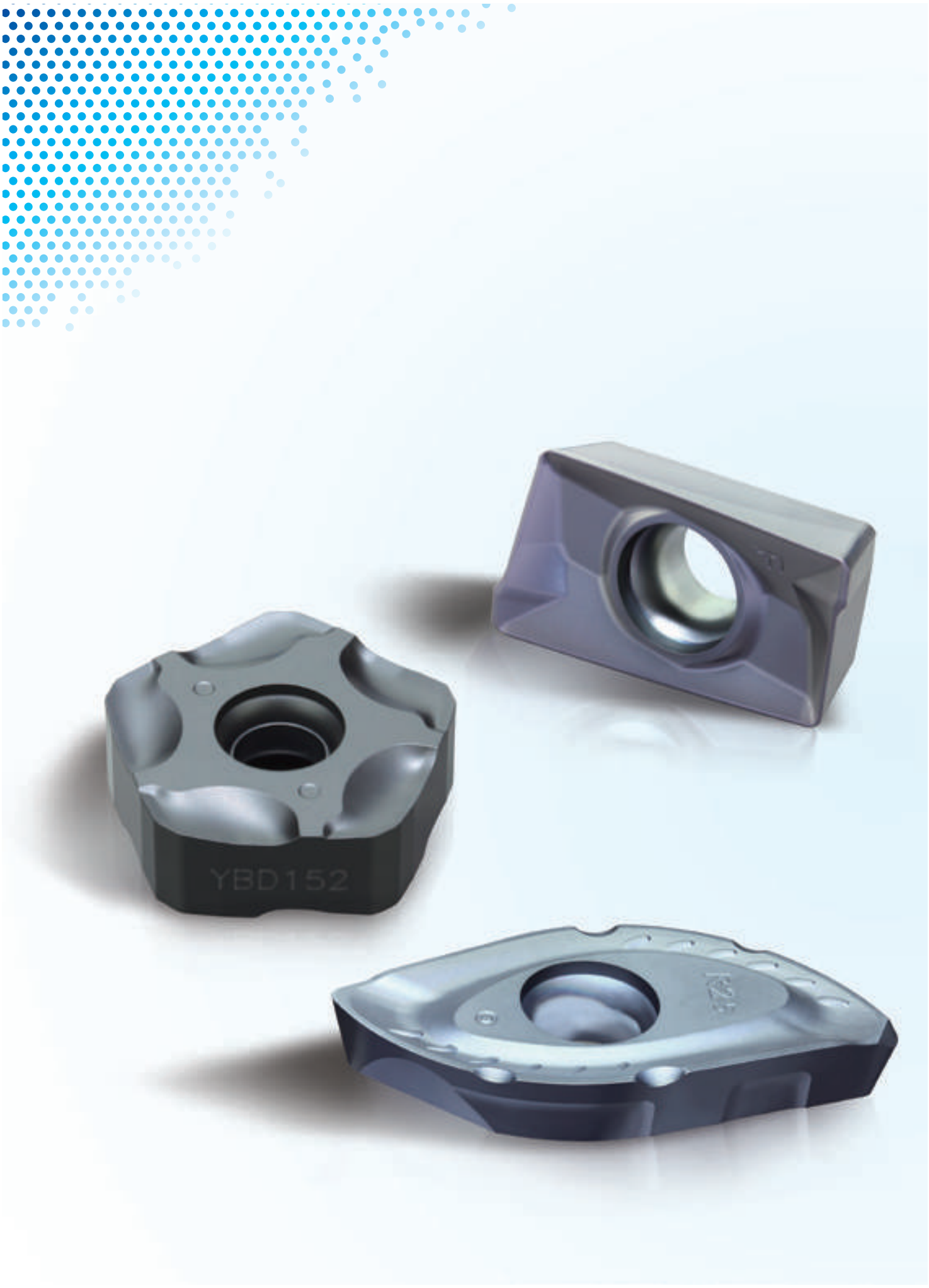
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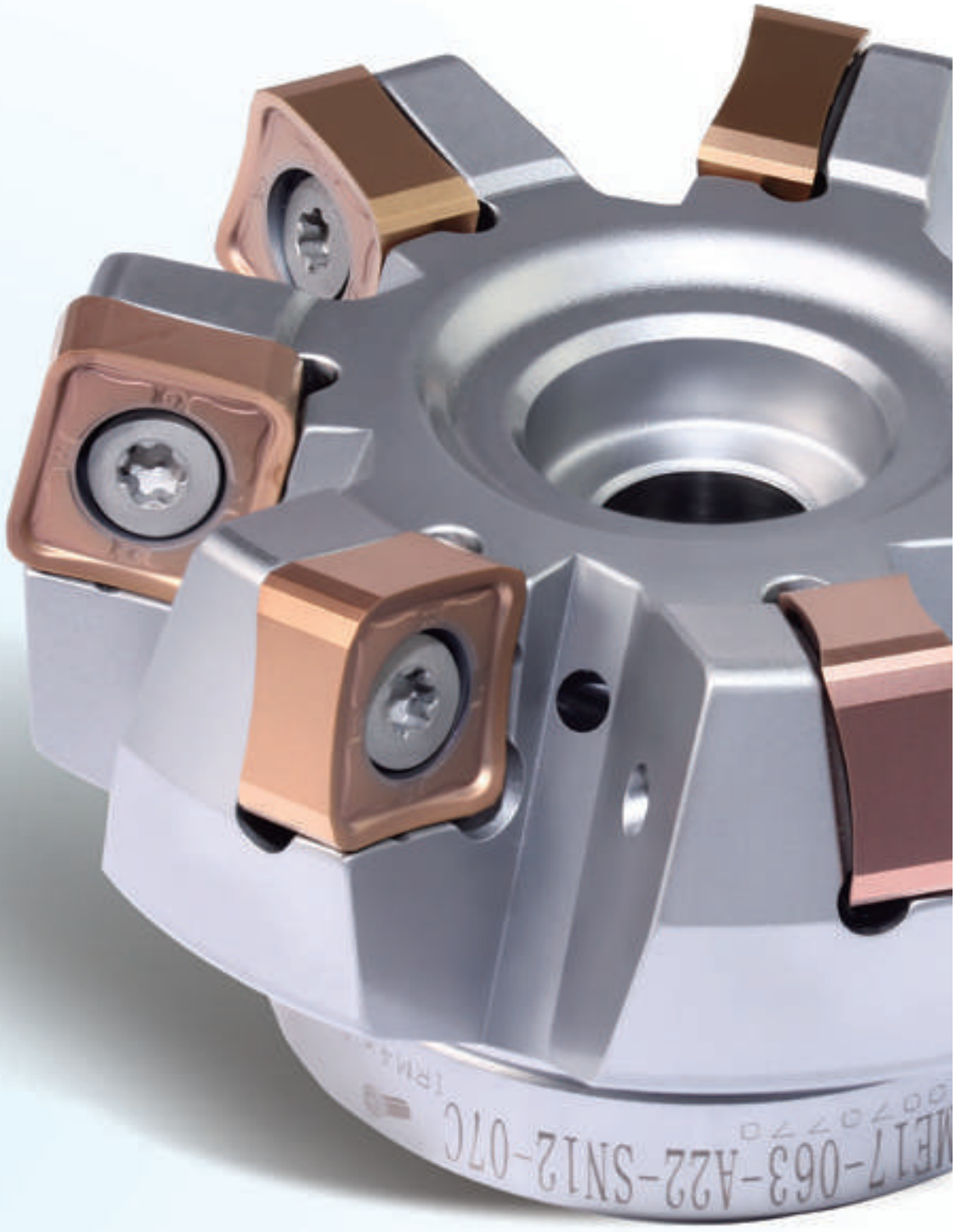
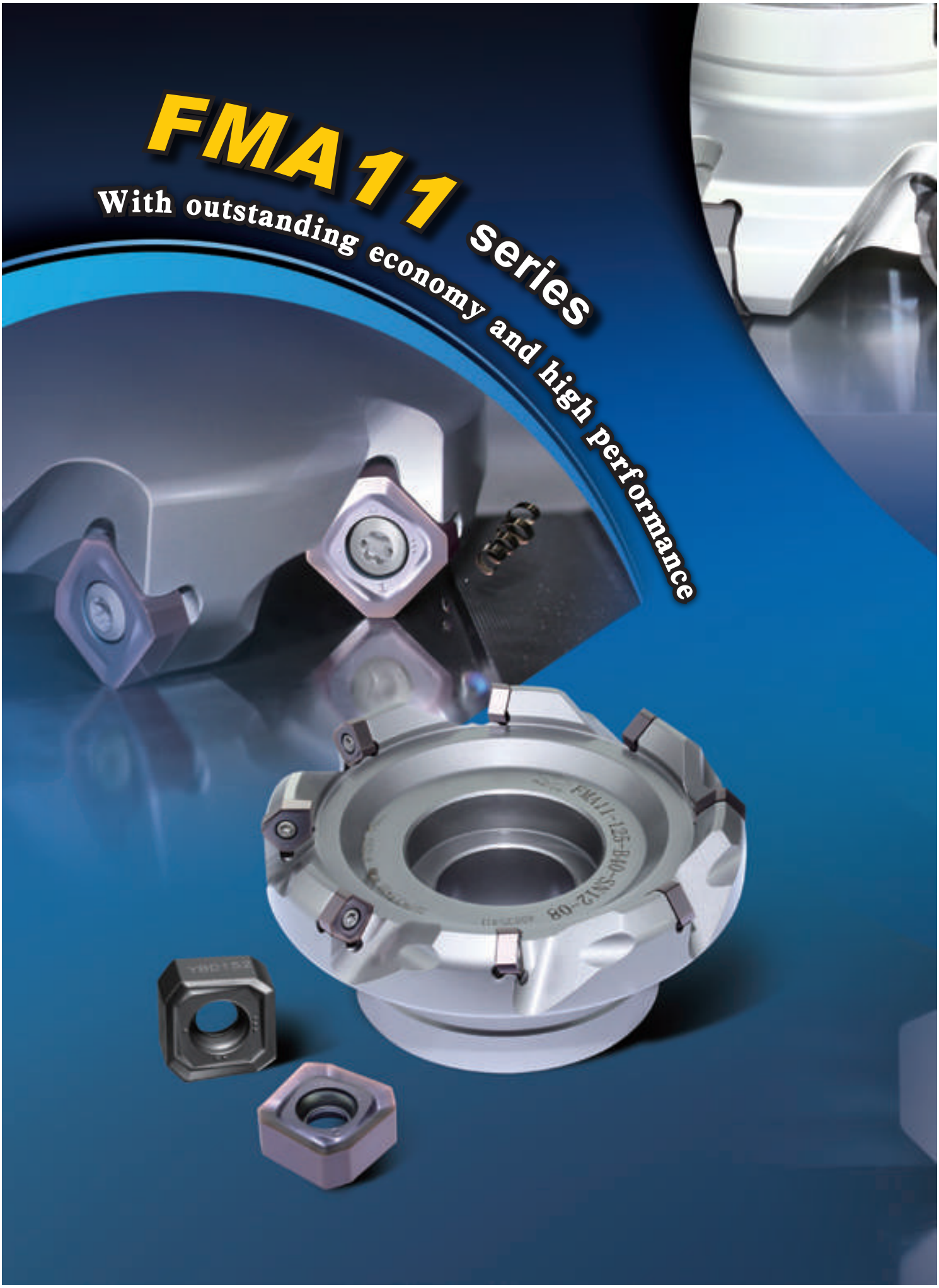


Milling Tools

Indexable milling tools

FMA11 series

With outstanding economy and high performance




FMA12 series
High Performance Face Milling
with 16 edges for outstanding
economy Milling
FMA14 series

New generation of the tangential milling cutter

EMP09 series

Milling

B


New Champion in Milling YBC302
Black Diamond Series grade

How to choose the right indexable milling tools

■ Classification of milling tools

According to types of machining operation

Applicable machining operations
For face milling, chamfering, shoulder milling etc.

Product series

Type of machining

Workpiece materials

Approach angle

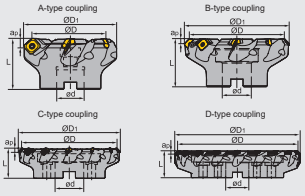
Structure and coupling size

Inserts specification
Insert shape, type, dimensions, grade, stock, etc.

Face milling tools Kr:45°

FMA01 P M K N S

A-type coupling / B-type coupling / C-type coupling / D-type coupling



Specification of tools

Type		Stock R	Stock L	Basic dimensions(mm) ØD	ØD1	ød	L	apmax	Number of teeth Z	Type of coupling	Weight (kg)
FMA01 Coarse pitch	-050-A22-SE12-04	▲	△	50	61	22	40	6	4	A	0.3
	-063-A22-SE12-05	▲	△	63	74	22	40	6	5	A	0.5
	-080-A27-SE12-06	▲	△	80	91	27	50	6	6	A	1.2
	-100-B32-SE12-07	▲	△	100	107	32	50	6	7	B	1.52
	-125-B40-SE12-08	▲	△	125	136	40	63	6	8	B	2.6
	-160-B40-SE12-07	▲	△	160	174	40	63	6	7	B	4.548
	-160-B40-SE12-10	▲	△	160	170	40	63	6	10	B	4.92
	-200-C60-SE12-08	▲	△	200	214	60	63	6	8	C	6.175
	-200-C60-SE12-12	▲	△	200	210	60	63	6	12	C	7.6
	-250-C60-SE12-10	▲	△	250	264	60	63	6	10	C	12.596
	-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
	-100-B32-SE18-04	▲	△	100	120	32	63	10.4	4	B	2.22
	-125-B40-SE18-05	▲	△	125	145	40	63	10.4	5	B	3.15
	-160-B40-SE18-06	▲	△	160	180	40	63	10.4	6	B	5.01
	-200-C60-SE18-08	▲	△	200	220	60	63	10.4	8	C	6.9
	-250-C60-SE18-10	▲	△	250	270	60	63	10.4	10	C	13.1
	-315-D60-SE18-12	▲	△	315	335	60	80	10.4	12	D	24.5

▲Stock available △Make-to-order

Spare parts

Diameter ØD	Insert	Insert screw	Shim	Shim screw	Wrench	Wrench
Ø50-Ø100	SEET12□□-□□	I60M3.5×10	–	–	WT15IS	–
Ø50-Ø315	SEET12□□-□□	I60M3.5×12	S13BS	SM5×7XA		WH35L
Ø100-Ø315	SEET18□□-□□	I60M5×17	S18BS	SM8×9XA	WT20IT	WH50L

Tools code key B24–B25 | Grade selection guide B19–B23 | Technical data B234–B240

Spare parts

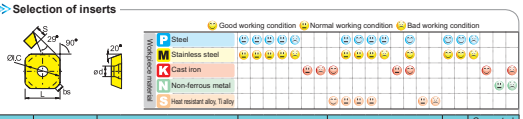
Tools specification
Tool shape, dimensions, stock, etc

Tool shape

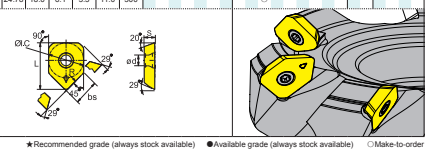
Assembly of tools and spare parts

Tools code key, reference to grade selection, technical data

Selection of inserts



Insert shape	Type	Basic dimensions(mm) L	Ø I.C	S	ød	bs	R	CVD Coating	PVD Coating	Cermet	Cemented carbide
	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	–	● ●	★ ★ ●		
	SEET18T6-DM	18.0	18.0	6.1	5.5	1.5	–	○ ○			
	SEET18T6-EM	18.0	18.0	6.1	5.5	1.5	–	○	○		
	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	★ ● ★	★	★	
	SEET18T6-W	24.78	18.0	6.1	5.5	11.0	500		○		



★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Chipbreaker selection for FMA01 milling inserts

Classification \ Function	For finishing	For semi-finishing	For roughing
P	-DF	-DM	-DR
M, S	-EF	-EM	
K	-CF	-CM	-CR
N	-LH		

Chipbreaker selection

How to choose indexable milling inserts

■ Detailed information for indexable milling inserts

Listed according to insert shape

Select insert grade according to workpiece material and working condition. Prior to selecting grade, please refer to the working condition suitable for the workpiece material.

😊 Good working condition: machine works well and stably. There are high requirements for dimensional precision of components and quality surface.

😃 Normal working condition: machine works normally. There are certain requirements for dimensional precision of components and surface quality.

☹ Bad working condition: machine works with bad stability. There are high requirements for high metal removal rate.

Insert shape and size

Insert shape

Insert grade

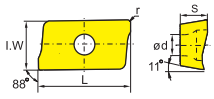
Stock condition

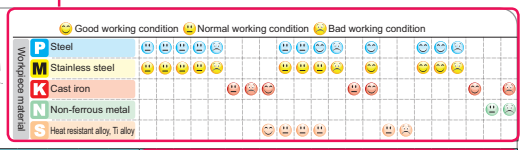
Insert shape

Insert dimension

Insert type

APKT





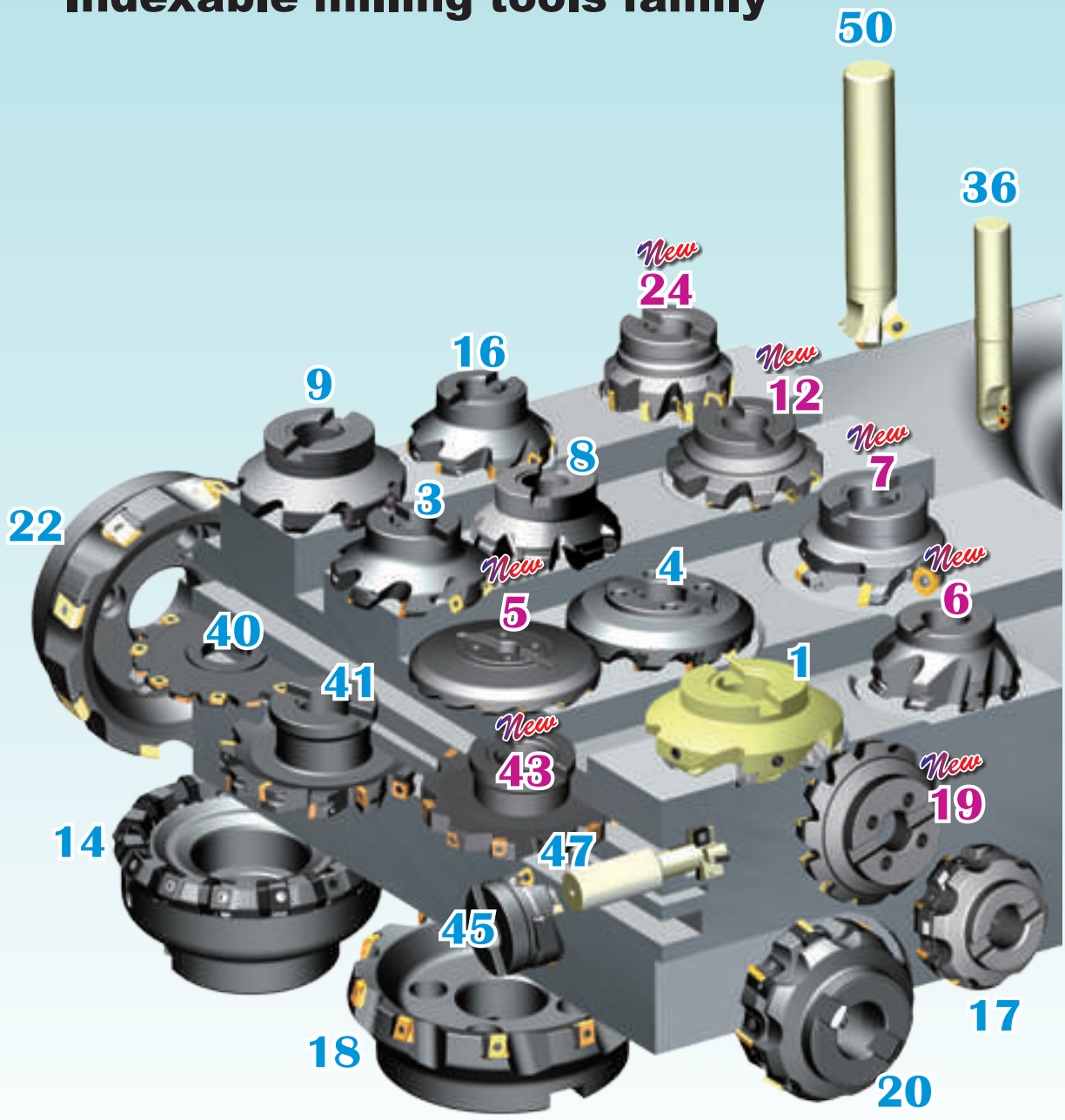
Insert shape	Type	Basic dimensions(mm)					CVD Coating						PVD Coating						Cermet		Cemented carbide		
		L	I.W	S	ød	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	APKT070204-APF	7.32	4.34	2.38	2	0.4	●		●								★											
	APKT11T304-APF	12.24	6.6	3.6	2.8	0.4	●		●								★											
	APKT11T308-APF	12.24	6.6	3.6	2.8	0.8	●		●								★				●	●						
	APKT160408-APF	17.877	9.33	5.76	4.4	0.8	●										★				●	●						
	APKT070204-APM	7.32	4.34	2.38	2	0.4				●		●					★											
	APKT11T304-APM	12.24	6.6	3.6	2.8	0.4				●							★											
	APKT11T308-APM	12.24	6.6	3.6	2.8	0.8				●		●					★				●	●						
	APKT11T312-APM	12.24	6.6	3.6	2.8	1.2						●					★											
	APKT11T316-APM	12.24	6.6	3.6	2.8	1.6											★											
	APKT11T320-APM	12.24	6.6	3.6	2.8	2.0				●							★											
	APKT160408-APM	17.877	9.33	5.76	4.4	0.8				●		●					★				●	●						
	APKT160416-APM	17.877	9.33	5.76	4.4	1.6				●		●					★				●							
	APKT160420-APM	17.877	9.33	5.76	4.4	2.0						●					★											
	APKT160424-APM	17.877	9.33	5.76	4.4	2.4											★											
	APKT160430-APM	17.877	9.33	5.76	4.4	3.0											★											
	APKT11T304-ALH	12.24	6.6	3.6	2.8	0.4																				★	★	
	APKT11T308-ALH	12.24	6.6	3.6	2.8	0.8																				★	○	
	APKT160408-ALH	17.877	9.33	5.76	4.4	0.8																				★	★	

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

B MILLING

Indexable Milling Tools

Indexable milling tools family



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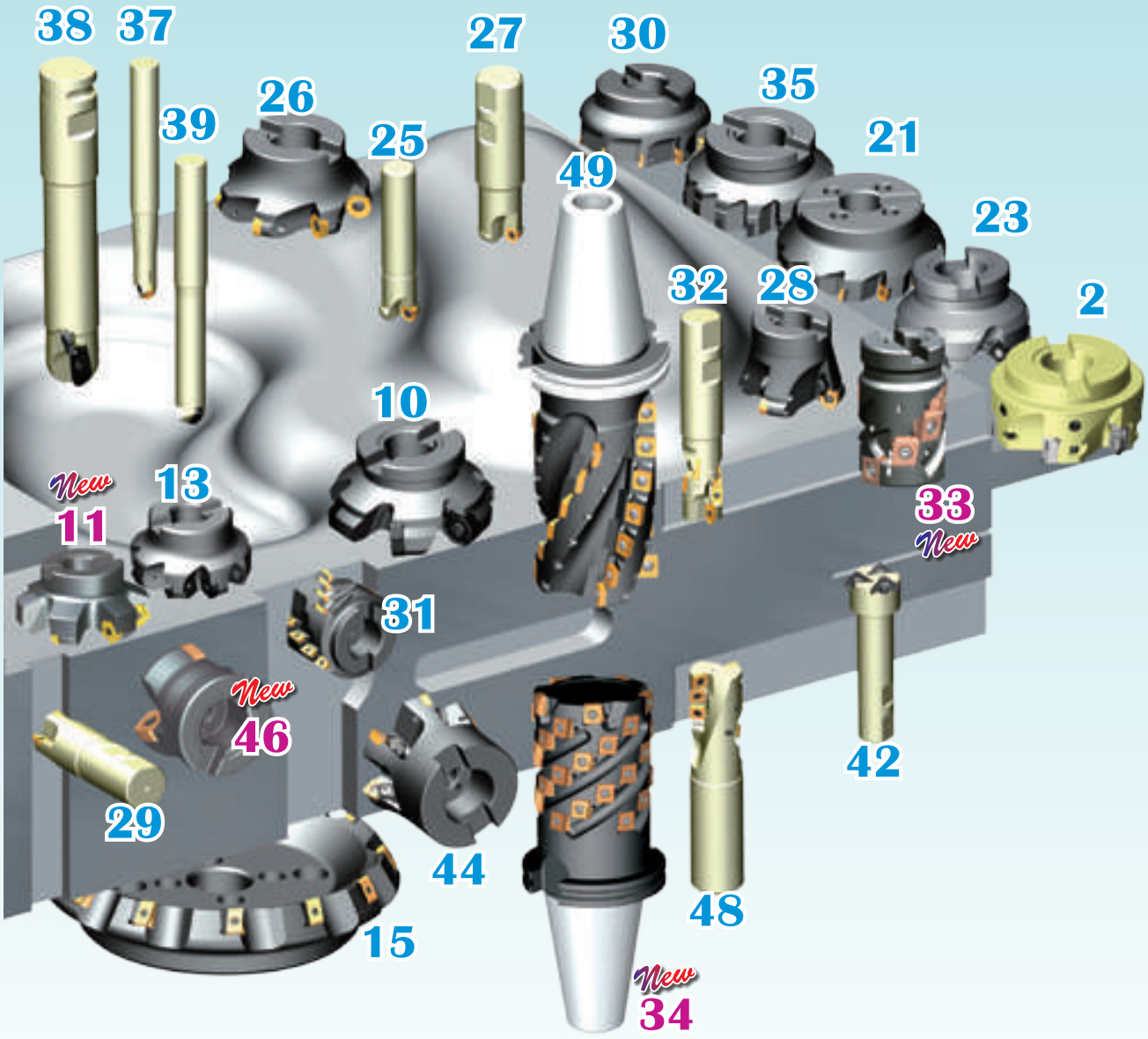

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	HMP01 EC(Ø50-Ø80)	B195
50	CM□01	B198


WHIRLWIND
FMD02
milling cutter series

Indexable milling tools overview

Operating pattern	Series/Shape	Approach angle / Max. cutting depth.	Applicable insert	Application overview	Features
High-speed high-precision milling tools	**AMA01**  B27	Kr=45° a_{pmax}=6.6	SEHT12T3AFFN-AL	High-speed high-precision milling of Aluminum alloy, cast iron.	• Diameter range Ø50-Ø500 • Aluminum alloy body with high strength, light weight • Unique tool clamping design • Elastic runout adjustment structure, high pressure internal cooling, and high-precision cutting inserts enable high-quality, high-precision, high-efficiency, and high-stability machining of various materials.
		Kr=45° a_{pmax}=2.0	SEHT12T308AFFN-CBN		
		Kr=45° a_{pmax}=2.5	SEHT12T308AFFN-PCD		
	AMP01  B29	Kr=90° a_{pmax}=12	APHT12T304PPFR-AL		
		Kr=90° a_{pmax}=1.0	APHT12T304-W		
		Kr=90° a_{pmax}=2.0	APHT12T304PPFR-CBN		
		Kr=90° a_{pmax}=3.0	APHT12T304PPFR-PCD		
Face milling	**FMA01**  B31-32	Kr=45° a_{pmax}=6.0	SEET12T3-DF/DM/DR SEET12T3-CF/CM/CR SEET12T3-EF/EM SEET12T3-LH/W	General face milling of the following materials: steel, alloy steel, stainless steel, cast iron, aluminum alloy, high-temperature alloy	• Diameter range Ø50-Ø315. • Large rake angle makes cutting easier and faster. • Wide applications can be achieved by using available inserts with different chipbreakers. • Adopting inserts with wiper can improve surface quality.
		Kr=45° a_{pmax}=10.4	SEET18T6-DM/EM/W		
	FMA03  B36	Kr=45° a_{pmax}=5.5	SE□□1203A□□□□	General face milling of steel, stainless steel, cast iron	• Diameter range Ø80-Ø315. • large rake angle makes cutting easier and faster. • Top clamping achieves better vibration resistance.
		Kr=45° a_{pmax}=7.5	SE□□1504A□□□□		
	FMA03A New  B37	Kr=45° a_{pmax}=5.5	SE□□1203A□□□□		• Diameter range Ø80-Ø350. • Large rank angle makes cutting easier and faster. • Top clamping makes it easy to assemble and better vibration resistance. • Good rigidity of the tool system. The first choice for mold surface milling to achieve high surface quality.
		Kr=45° a_{pmax}=7.5	SE□□1504A□□□□		
	FMA04  B40	Kr=45° a_{pmax}=3.5	OFKT05T3-DF/DM OFKT05T3-LH	Face milling of steel, alloy steel, cast iron, aluminum alloy	• Diameter range Ø50-Ø160. • High-economy milling tool with 8 cutting edges. • Screw clamping, high precision.
	New  B42	Kr=45° a_{pmax}=4.0	ODHT060508-GL/GM/GH/LH ODMT060512-GM	Face milling of steel, alloy steel, cast iron, aluminum alloy and high-temperature alloy	• Diameter range Ø50-Ø160. • High-economy milling tool with 8 cutting edges. • Top clamping makes it easy to assemble and disassemble.

Indexable milling tools overview

Operating pattern	Series/Shape	Approach angle / Max. cutting depth.	Applicable insert	Application overview	Features
Face milling	**FMA07**  B47	Kr=45° a_{pmax}=4.0	ONHU060408-PF/PM	General face milling of steel and cast iron	• Diameter range Ø25-Ø50. • High-economy milling tool with 16 cutting edges.
	 B46	Kr=45° a_{pmax}=5.0	ONHU08T508-PF/PM/W	General face milling of steel and cast iron	• Diameter range Ø50-Ø315. • High-economy milling tool with 16 cutting edges.
	FMA11  B51-52	Kr=45° a_{pmax}=5.5	SNEG1205ANR-GM/HGR/W	General face milling of steel, cast iron and high-temperature alloy	• Diameter range Ø63- Ø315. • Double-sided chipbreaker milling insert has eight cutting edges and high economy. • Large rake angle design and unique chip breaker structure of insert lead to low power consumption. • Double negati ve rake angle structure and super thick insert has higher safety and outstanding toughness, which can realize great depth cutting. • Insert has excellent machining perfor-mance with wiper edge.
		Kr=45° a_{pmax}=7.0	SNEG1506ANR-GM/HGR/W		
		Kr=45° a_{pmax}=9.0	SNEG1907ANR-HGR		
	FMA12 New  B55-56	Kr=45° a_{pmax}=4.0	ONHU0604□□ANN-GL/GM/GH ONMU0604□□-GH/GM	General face milling of steel, cast iron and high-temperature alloy	• Diameter rangeØ50-Ø400. • High Performance Face Mill with 16 edges for outstanding economy. •Double negative rake angle, in combination with helical insert structure, achieves double positive axial angle, which will help reduce cutting resistance and improve chip evacuation. • Unique 3-dimentional edge.
		Kr=45° a_{pmax}=5.5	ONMU09□□□□-GM/GH ONHU09□□□□ANN-GM/GH/GL		
	FMA14 New  B59	Kr=45° a_{pmax}=5.5	PNEG110512-GL PNEG110530-GM PNEG110530-GH	General face milling of steel, stainless steel, cast iron	• Diameter rangeØ50-Ø315. • Hige economy effect milling cutter with 10 cutting edges. • The balanced design with 45 clearance angle. • High anti-vibration ability which ensure the good surface quanlity.
	FMA17 New  B61	Kr=45° a_{pmax}=6.5	SNGX1205ANN-GL/GM/GH SNMX1205ANN-GM SNMX120512-GL/GM/GH	General face milling of steel, cast iron and high-temperature alloy	• Diameter rangeØ50-Ø400. • Double-sided chipbreaker milling insert has eight cutting edges and high economy; • Same inserts for right and left cutters. Coarse pitch and close pitch are available. • Diversified chipbreaker matching different coating for a wide range of application.
	FMD02  B64-65	Kr=67° a_{pmax}=5.0	PNEG110512R/L-CF/CM/CR	General face milling of steel and cast iron	• Diameter range Ø50-Ø315. • High-economy milling tool with 10 cutting edges.
		Kr=67° a_{pmax}=7.5	PNEG110512R/L-PF/PM/PR		
		Kr=67° a_{pmax}=6.5	PNEG110512-KH/KM/KL		
	 B69	Kr=55° a_{pmax}=6.0	HNEX090512-DF/DM HNEX090512-DR	Face milling of cast iron	• Diameter range Ø80-Ø315. • High-economy milling tool with 12 cutting edges. • Top clamping makes it easy to assemble and disassemble.

Indexable milling tools overview

Operating pattern	Series/Shape	Approach angle / Max. cutting depth.	Applicable insert	Application overview	Features
Face milling	**FMD03**  B71	Kr=60° a_{pmax}=12.0	LNKT2007DN-ZR	Heavy-duty face milling of steel and alloy steel	• Diameter range Ø125-Ø400. • Double positive rake angles can reduce cutting forces. • Inserts are mounted upright, suitable for heavy machining with high cutting depth. • Easy to assemble and clamp inserts.
		Kr=60° a_{pmax}=17.0	LNKT2510-ZR		
	FME02  B73	Kr=75° a_{pmax}=6.0	SPKW1204EDFR SPKW1204EDSR SPKT1204EDR	Face milling of steel, alloy steel and cast iron	• Diameter range Ø50-Ø125. • Kr 75°, general face milling. • Wide applications can be achieved by using inserts with different chipbreakers.
	FME03  B75	Kr=75° a_{pmax}=6.0	SP□N1203(1504)ED□□ SP□R1203(1504)ED□□	Face milling of steel, alloy steel and cast iron	• Diameter range Ø80-Ø315. • Kr 75°, general face milling. • Top clamping makes it easy to assemble and disassemble.
		Kr=75° a_{pmax}=8.0	SP□N1504ED□□ SP□R1504ED□□		
	FME04  B79	Kr=75° a_{pmax}=12.0	LNKT1506EN-ZR	Heavy-duty face milling of steel and alloy steel	• Diameter range Ø125-Ø315. • Double positive rake angles can reduce the cutting force. • Inserts are mounted upright, suitable for heavy machining at high cutting depth. • Easy to assemble and clamp inserts.
	FME17 New  B81	Kr=75° a_{pmax}=8.0	SNGX1205ENN-GL/GM/GH SNMX120512-GL/GM/GH	General face milling of steel, cast iron and high-temperature alloy	• Diameter range Ø50-Ø400. • Double-sided chipbreaker milling insert has eight cutting edges and high economy; • Same inserts for right and left cutters. Coarse pitch and close pitch are available. • Diversified chipbreaker matching different coating for a wide range of application.
	FMP01  B83	Kr=90° a_{pmax}=18.0	TPKN2204PD□ TPKN2204PDF□ TPKN2204PDT□	Face milling of steel, alloy steel and cast iron	• Diameter range Ø80-Ø315. • Kr 90° , for square shoulder milling. • Top clamping makes it easy to assemble and disassemble.
	FMP02  B85	Kr=90° a_{pmax}=6.7	SEET09T308PER-APF/APM/APR	Face milling of steel, alloy steel, stainless steel, cast iron and high-temperature alloy	• Diameter range Ø40-Ø315. • Kr 90°, for square shoulder milling. • Different pitches: coarse pitch, close pitch and extra close pitch. • High precision insert, high work-piece surface quality. • Optimized chipbreaker and grade, suitable for finishing, semi-finishing and roughing.
		Kr=90° a_{pmax}=10.8	SEET120308PER-APF/APM/APR		
	FMP03  B90	Kr=90° a_{pmax}=13.0	LNKT1506EN-ZR	Heavy-duty face milling of steel and alloy steel	• Diameter range Ø125-Ø315. • Double positive rake angles can reduce the cutting force. • Inserts are mounted upright, suitable for heavy machining at high cutting depth. • Easy to assemble and clamp inserts.
		Kr=90° a_{pmax}=17.0	LNKT2007DN-ZR		
		Kr=90° a_{pmax}=22.0	LNKT2510-ZR		

Indexable milling tools overview

Operating pattern	Series/Shape	Approach angle / Max. cutting depth.	Applicable insert	Application overview	Features
Face milling	**FMP12**  B93	Kr=90° a_{pmax}=5.7	WNHU0604□□PNR-GM WNMU060408PNN-GM	Steel, alloy steel, cast iron and aluminum alloy	• Diameter range Ø50-Ø315 • 90° approach angle can be used for shoulder milling, face milling, groove milling, etc.; -Six-flute double-sided groove milling inserts with wiper for large feed machining; double negative angle of the tool body combined with unique insert structure to achieve double positive tool angle, reducing cutting forces.
		Kr=90° a_{pmax}=7.7	WNHU0806□□PNR-GM WNMU080608PNN-GM WNHU080616PNR-LH		
	FMP12  B94	Kr=90° a_{pmax}=5.7	WNHU0604□□PNR-GM		• Diameter range Ø25-Ø50 • 90° approach angle can be used for shoulder milling, face milling, groove milling, etc.; -six-flute double-sided groove milling inserts with wiper for large feed machining; • Double negative angle of cutter body combined with unique insert structure to achieve double positive tool angle, reducing cutting forces.
	FMP17 New  B96-97	Kr=88° a_{pmax}=10.5	SNGX1205PNN-GL/GM/GH SNMX120512-GL/GM/GH SNCU120420-W4	General face milling of steel, cast iron and high-temperature alloy	• Diameter range Ø50-Ø400. • Double-sided chipbreaker milling insert has eight cutting edges and high economy; • Same inserts for right and left cutters. Coarse pitch and close pitch are available. • Diversified chipbreaker matching different coating for a wide range of application.
	FMR01  B99	a_{pmax}=5.0	RCKT10T3MO-DM	Cavity profile milling of steel, alloy steel, stainless steel and cast iron	• Diameter range Ø25-Ø50. • R-type inserts have extra-strong cutting edges. • Suitable for machining of curved surface of die. • Economical milling tools with screw clamping.
		a_{pmax}=6.0	RCKT1204MO-DM/DR/ ER/NM		
	FMR02  B102	a_{pmax}=6.0	RCKT1204MO-DM/DR/ER/NM RCMW1204MOBS01225 RCMW1204MOAS01225	Face milling and cavity profile milling of steel, alloy steel, stainless steel and cast iron	• Diameter range Ø50-Ø160. • R-type inserts have extra-strong cutting edges. • Suitable for machining of curved surface of die. • Economical milling tools with screw clamping.
		a_{pmax}=8.0	RCKT1606MO-DM/DR /ER/NM		
		a_{pmax}=10.0	RCKT2006MO-DR/ER		
	FMR03  B106	a_{pmax}=4.0	RDKW0803MO	Cavity profile milling of steel, alloy steel, stainless steel and cast iron	• Diameter range Ø16-Ø50. • R-type inserts have extra-strong cutting edges. • Suitable for machining of curved surface of die. • Economical milling tools with screw clamping.
		a_{pmax}=5.0	RDKW10T3MO RDKT10T3MO-NM		
		a_{pmax}=6.0	RDKW1204MO		
	FMR04  B109	a_{pmax}=6.0	RDKW1204MO	Face milling and cavity profile milling of steel, alloy steel, stainless steel and cast iron	• Diameter range Ø50-Ø160. • R-type inserts have extra-strong cutting edges. • Suitable for machining of curved surface of die.
		a_{pmax}=8.0	RDKW1605MO		
		a_{pmax}=10.0	RDKW2006MO		
Square shoulder milling	**EMP01**  B112-114	Kr=90° a_{pmax}=6.0	APKT070204-APF/APM	Multi-function milling of steel, alloy steel, stainless steel, cast iron, aluminum alloy and high-temperature alloy	• Two mounting styles: Straight shank and Weldon shank, diameter range Ø10-Ø63. • Kr 90° , for square shoulder milling, slot milling, ramp milling, etc. • Inserts with wiper, also suitable for face milling. • Inserts with 3D helical cutting edge, less cutting force.
		Kr=90° a_{pmax}=10.5	APKT11T3□□-APF/APM APKT11T3□□-ALH		
		Kr=90° a_{pmax}=15.5	APKT160408- APF/APM APKT160408-ALH		

Indexable milling tools overview

Operating pattern	Series/Shape	Approach angle / Max. cutting depth.	Applicable insert	Application overview	Features
Square shoulder milling	**EMP02**  B118	Kr=90° a_{pmax}=11.5	APKT11T3□□-APF/APM APKT11T3□□-ALH	Face milling of steel, alloy steel, stainless steel, cast iron, aluminum alloy and high-temperature alloy	• Diameter range Ø50-Ø160. • Kr 90° , for square shoulder milling, slot milling, ramp milling, etc. • Inserts with wiper, also suitable for face milling. • Inserts with 3D helical cutting edge, less cutting force.
		Kr=90° a_{pmax}=15.5	APKT160408-APF/APM APKT160408-ALH		
	EMP03  B121	Kr=90° a_{pmax}=39.0	APKT11T3□□-APF/APM APKT11T3□□-ALH	Milling of steel, alloy steel, stainless steel, cast iron, aluminum alloy and high-temperature alloy at high cutting depth	• Diameter range Ø50-Ø100. • End mills with positive helical angle, good chip removal. • For side face milling and slot machining. • Close pitch, high machining efficiency.
	EMP04  B122	Kr=90° a_{pmax}=29.4~58.0	APKT11T3□□-APF/APM APKT11T3□□-ALH	Multi-function drilling and milling of steel alloy steel, stainless steel, cast iron and high-temperature alloy	• Diameter range Ø20-Ø40. • End mills with positive helical angle, good chip removal. • For side face milling and slot machining. • Close pitch, high machining efficiency.
	EMP09 New  B126	Kr=90° a_{pmax}=8.0	LNKT0804□□PNR-GM/GL LNMT080404PNR-GM	Multiple functional milling of steel, alloy steel, stainless steel, cast iron and high-temperature alloy	• Diameter rangeØ20-Ø40. • straight shank and tappered shank types. • The tangential inserts with 90-degree clearance angel can be used in square shoulder milling and slotting which can stand more cutting forces.
		Kr=90° a_{pmax}=11.5	LNKT1206□□PNR-GM/GL LNMT120608PNR-GM		
	 B127-128	Kr=90° a_{pmax}=8.0	LNKT0804□□PNR-GM/GL LNMT080404PNR-GM	face milling of steel, alloy steel, stainless steel, cast iron and high-temperature alloy	• Diameter rangeØ40-Ø160. • The tangential inserts with 90-degree clearance angel can be used in square shoulder milling and face milling with good rigidity..
		Kr=90° a_{pmax}=11.5	LNKT1206□□PNR-GM/GL LNMT120608PNR-GM		
		Kr=90° a_{pmax}=15	LNKT1607□□PNR-GM/GL LNMT160708PNR-GM		
	 B129	Kr=90° a_{pmax}=33~63	LNKT1206□□PNR-GM/GL LNMT120608PNR-GM	large cutting depth milling of steel, alloy steel, stainless steel, cast iron and high-temperature alloy	• Diameter rangeØ32-Ø100. • Used in side milling and slotting.. • The helical cutting edge design lead to light cut.
	 B130	Kr=90° a_{pmax}=30~53	LNKT0804□□PNR-GM/GL LNMT080404PNR-GM		• Diameter rangeØ25-Ø50. • High strength on the cutting edge with sharp cutting edge. • Used in side milling and slotting. • The tangential inserts could stand more cutting forces.
			LNKT1206□□PNR-GM/GL LNMT120608PNR-GM		
	EMP09 BT New  B131	Kr=90° a_{pmax}=63~125	LNKT1206□□PNR-GM/GL LNMT120608PNR-GM		• Diameter rangeØ50-Ø80. • High strength on the cutting edge with sharp cutting edge. • Used in side milling and slotting. • The tangential inserts could stand more cutting forces.
	EMP09 JT New  B132	Kr=90° a_{pmax}=85~125			

Indexable milling tools overview

Operating pattern	Series/Shape	Approach angle / Max. cutting depth.	Applicable insert	Application overview	Features
Square shoulder milling	**EMP13**  B136	Kr=90° a_{pmax}=11.2	AN□X1105□□PNR-GM/LH	Multi-functional milling of steel, alloy steel, stainless steel, cast iron and aluminum alloy	• Diameter range Ø25-Ø160. • Designed with extra thick insert in combination with double negative tool body, achieving double positive cutting angle, reducing cutting force, as well as greatly improving impact resistance. • Properly designed cutting edge with high precision control can achieve high quality 90°square shoulder milling.
	 B137	Kr=90° a_{pmax}=14.5	AN□X1506□□PNR-GM/LH		
	 B138	Kr=90° a_{pmax}=43~64	AN□X1105□□PNR-GM/LH AN□X1506□□PNR-GM/LH		
	 B139	Kr=90° a_{pmax}=43~53			
Profile milling	**BMR01**  B141	Cutting depth: see the detailed information about tool specifications	ZDET□□CYR□□ ZPNT2204CYR□□ SPMT060304 SDMT□□	Profile machining of steel, stainless steel and cast iron	• Diameter range Ø20-Ø63. • Very suitable for rough machining large mold. • Ball nose cutter with 3-cutting-edge inserts, perfect economical efficiency.
	BMR02  B143		ROHX□□	Profile machining of steel, stainless steel and cast iron	• Diameter range Ø12-Ø20. • For profile finish machining. • Stable assembly. • Insert with two cutting edges, perfect economical efficiency.
	BMR03  B145		XPHT□□R□□- GM	Profile machining of steel, stainless steel and cast iron	• Diameter range Ø16-Ø50. • For profile finish machining. • Stable assembly. • Insert with two cutting edges, perfect economical efficiency.
	 B146				
	 B147				
	 B148				

Indexable milling tools overview

Operating pattern	Series/Shape	Approach angle / Max. cutting depth.	Applicable insert	Application overview	Features
Profile milling	**BMR04**  B157  B158	cutting depth: see the detailed information about tool specifications	ZOHX□□	Profile machining of steel, stainless steel and cast iron	• Diameter range Ø12-Ø32. • High precision, for finish profile machining • Two types of chipbreaker, used in different machining conditions. • High assembling precision, good stability.
Side and face milling	**SMP01**  B164  B165		XSEQ12□□	Slot milling of steel, stainless steel and cast iron	• Diameter range Ø63-Ø250. • Two mounting styles: mounting by keyway and arbor mounting. • Groove width range : 8, 10, 12, 16, 18, 20mm.
	SMP03  B167  B168		MPHT□□	Slot milling of steel, stainless steel and cast iron	• Diameter range Ø80-Ø200. • Two mounting styles: mounting by keyway and arbor mounting. • Groove width range : 8, 10, 12, 16, 18, 20mm.
	SMP05  B171		QC16L□□ QC22L□□	Slot milling of steel, stainless steel and cast iron	• Diameter range Ø25-Ø44
	SMP09 New  B173-174  B175-176		LNGX1005□□-GM LNGX1407□□-GM	Slot milling of steel, stainless steel and cast iron	• Diameter range Ø80-Ø250. • Optimized positioning structure of the cutter for reliable positioning. • Tangential milling cutter for excellent impact resistance. • Large rank angle makes cutting easier and faster. Tailor-made cutters and inserts are available for grooving of different width and nose radius. • Diameter range Ø80-Ø315. • Optimized positioning structure of the cutter for reliable positioning. • Tangential milling cutter for excellent impact resistance. • Large rank angle makes cutting easier and faster. Tailor-made cutters and inserts are available for grooving of different width and nose radius.

Indexable milling tools overview

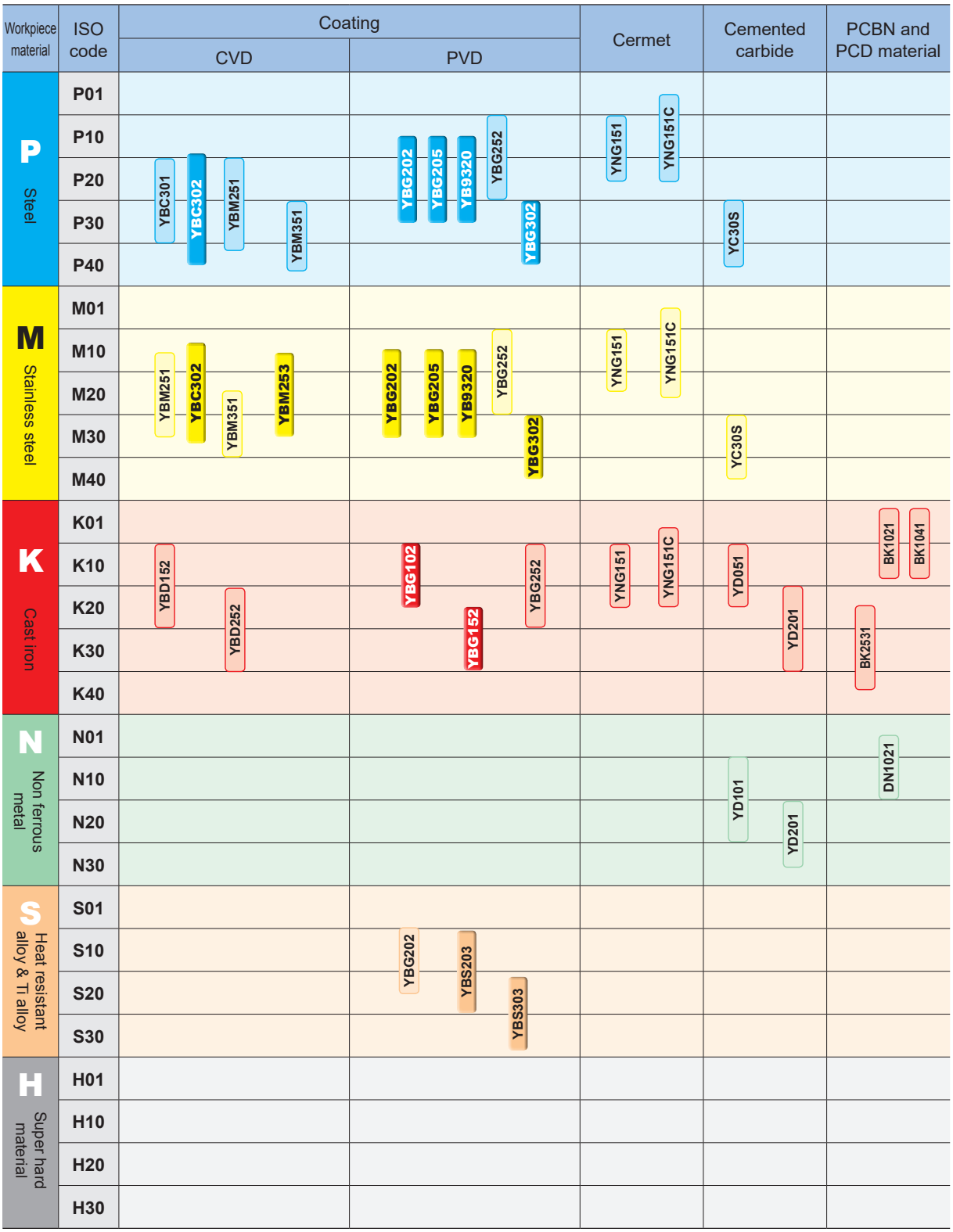
Operating pattern	Series/Shape	Approach angle / Max. cutting depth.	Applicable insert	Application overview	Features
Special milling (high feed)	**XMR01**  B178  B179  B181  B182	cutting depth: see the detailed information about tool specifications	SDMT□□-DM/PM/NM	Slot milling of steel, stainless steel and cast iron	• Diameter range Ø20-Ø160. • Two mounting types: straight shank and arbor mounting. • Cutting forces are resolved effectively, achieving cutting with high feed rate. • For plunge milling. • Double clamping, firm and reliable.
			WPGT□□ZSR WPGT□□ZSR-PM	Face and cavity profile milling of steel, stainless steel and cast iron in cavity applications	• Diameter range Ø20-Ø160. • Two mounting types: straight shank and arbor mounting. • Cutting forces are resolved effectively, achieving cutting with high feed rate. • Double clamping, firm and reliable.
	XMR03 New  B189		SNGU□□-GM	cavity milling, face milling of steel, alloy steel, stainless steel, and cast iron	• Diameter rangeØ50-Ø125 • double-sided inserts with 8 cutting edges and great economical effect. • Large rake angle design leads to low cutting resistance with high generality. • The overall impact resistance of the tool is outstanding. • Great anti-vibration ability and stable machining.
T-slot milling	**TMP01**  B191	Kr=90° a_{pmax}=9~28	MPHT□□	Machining T slot in cast iron	• Diameter range Ø21-Ø60. • Machining T-slot with nominal size 12, 14, 18, 22, 28, 36. • 86° rhombic inserts with positive angle.
Helical end mills	**HMP01**  B193	Kr=90° a_{pmax}=55	APKT150412-PM/KM SPMT120408-PM/KM	Milling of steel, alloy steel and cast iron at high cutting depth.	• Diameter range Ø40、Ø80. • Coarse and differential pitch, less vibration. • Holistic structure with good rigidity, interchangeable heads achieve high economical efficiency.
	 B194	Kr=90° a_{pmax}=74~144			
	HMP01 EC  B195	Kr=90° a_{pmax}=74~144			

Indexable milling tools overview

Operating pattern	Series/Shape	Approach angle / Max. cutting depth.	Applicable insert	Application overview	Features
Chamfering	**CMZ01**  B198	Kr=30°	SPMT120408	Chamfer machining of steel, alloy steel, stainless steel and cast iron	• Diameter range Ø12、Ø25、Ø32、Ø36. • With the function of milling small surface.
	CMA01  B199	Kr=45°		Chamfer machining of steel, alloy steel, stainless steel and cast iron	• Diameter range Ø12、Ø25、Ø32、Ø36. • With the function of milling small surface.
	CMD01  B200	Kr=60°			


Profile milling tools
series

Milling insert grades overview

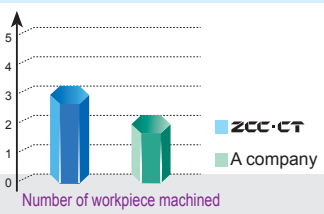
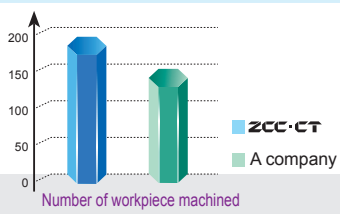


Grade classification for milling inserts

Coated Cemented Carbide CVD

Grade	Coating structure	Micro-structure	ISO applied range	Application field
YBC301	Combination of high-toughness, high-strength substrate and coating compo sed of TiCN、thin Al_2O_3 and TiN		P15~35	Suitable for semi-finish and rough milling of P-type material
YBC302	Combination of high toughness, high strength substrate and coating composed of TiCN, thin Al_2O_3 and TiN		P15~35 M10~30	Suitable for rough and semi-finish milling of P-type, M-type, whose hardness is below HRC45 and under
YBM251	Combination of high-toughness, high-strength substrate and coating compo sed of TiCN、thin Al_2O_3 and TiN		P15~40 M10~30	Suitable for semi-finish and rough milling of P- and M-type material
YBM253	Combination of high-toughness gradient substrate and coating composed of TiCN and ultra fine Al_2O_3		M10~30	Suitable for rough milling of M-type material
YBM351	Combination of high-toughness substrate and coating compoed of TiCN、thin Al_2O_3 and TiN		P25~40 M20~35	Suitable for rough milling of P- and M-type material
YBD152	Good combination of substrate with high wear-resistance and coating composed of TiCN and thick Al_2O_3		K05~25	Suitable for finish and semi-finish milling of K-type material
YBD252	Good combination of substrate with high wear-resistance and coating composed of TiCN and thick Al_2O_3		K15~35	Suitable for rough and semi-finish milling of K-type material

Application case

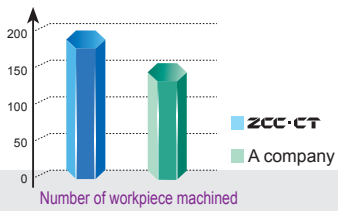
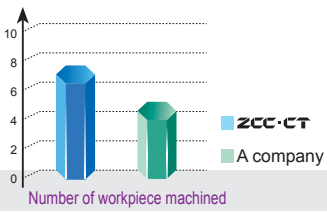
Component shape		
Machine and cooling	Vertical machining center, dry machining	Horizontal machining center, dry machining
Workpiece material and hardness	45# Forged steel HB240-270	HT250 HB220
Type of machining	Milling surface	Milling surface
Applicable tool	FMA01-125-B40-SE12-08	FMP02-100-B32-SE12-07
Applicable insert	YBM351/SEET12T3-DR	YBD252/SEET120308PER-APM
Cutting parameters	Vc=212m/min, fz=0.2mm/z, a_p=3mm	Vc=160m/min, fz=0.2mm/z, a_p=1.5mm
Application results		

Grade classification for milling inserts

Coated Cemented Carbide PVD

Grade	Coating structure	ISO applied range	Application field
YBG102	fine carbide substrate + Nano coating	K05~K20	Suitable for finish and semi-finish milling of K-type material
YBG202	Substrate with excellent deformation resistance + Nano coating	P10~30 M10~30 S05~20	PVD grade with wide application, widely applied in semi-finish milling of P-, M- and S-type material
YBG205	Ultra fine carbide substrate + Nano coating	P10~30 M10~30	Suitable for finishing and semi-finish milling of P- and M- material
YBG302	Substrate with good toughness and strength + Nano coating	P25~40 M25~40	Suitable for rough milling of P- and M-type material
YBG152	Substrate with moderate hardness and strength + Nano coating	K20~35	Suitable for rough and semi-finish milling of K-type material
YB9320	Substrate with high toughness + TiAlN based multi Nano coating	P10~30 M10~30	PVD grade with wide application, widely applied in finishing and semi-finish milling of P-, M- and S- material
YBS203	The excellent resistance to deformation substract+ Nano coating	S10~20	The general grade for S type machining, suitable for the milling of S type hard-to-cut materials.
YBS303	The great rigidity and strength substract + Nano coating	S20~30	Suitable for milling of titanium alloy materials

Application case

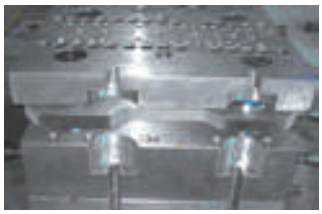
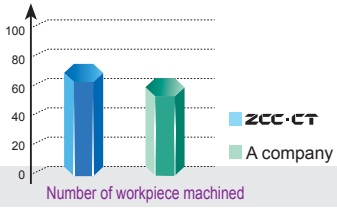
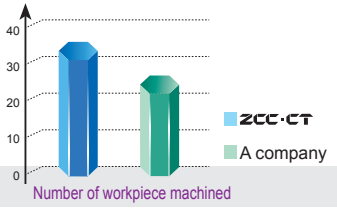
Component shape		
Machine and cooling	Machining center, dry cutting	Plane milling machine, dry cutting
Workpiece material and hardness	Nodular cast iron HB 220	7CrSiMoV HRC25
Type of machining	Milling surface	Cavity milling
Applicable tool	EMP02-050-A22-AP11-06	BMR03-050-MT5-M
Applicable insert	YB9320/APKT11T308-APM	YBG302/XPHT50R2507- GM
Cutting parameters	Vc=235m/min, fz=0.15mm/z, a_p=1~3mm	Vc=120m/min, fz=0.25mm/z, a_p=8mm
Application results		

Grade classification for milling inserts

Cermet

Grade	Coating structure	ISO applied range	Application field
YNG151		P05~20 M05~20 K05~20	Wide application in finish milling of P-, M-, and K-type material
YNG151C		P01~20 M01~20 K01~20	Wide application in finish milling of P-, M-, and K-type material

Application case

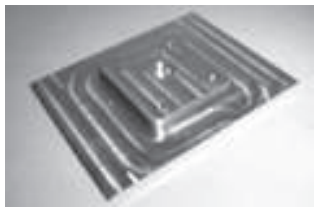
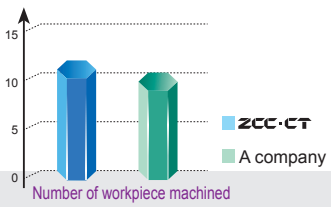
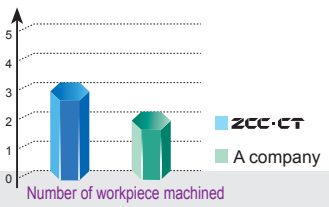
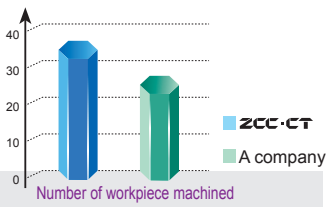
Component shape		
Machine and cooling	Machining center, dry cutting	Machining center, dry cutting
Workpiece material and hardness	45# HB 170~220	NAK80 HRC42~48
Type of machining	Finish milling surface	Finish milling surface
Applicable tool	FMA03-160-B40-SE12-08	FME03-160-B40-SP12-10
Applicable insert	YNG151/SEEN1203AFTN	YNG151C/SPEN1203EDER
Cutting parameters	Vc=400m/min, fz=0.1mm/z, a_p=0.3mm	Vc=420m/min, fz=0.12mm/z, a_p=0.35mm
Application results		

Grade classification for milling inserts

Cemented Carbide

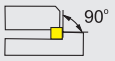
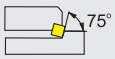
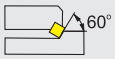
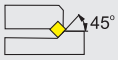
Grade	Coating structure	ISO applied range	Application field
YC30S		P25~40 M25~40	Suitable for rough milling of P- and M-type material
YD051		K05~20	Suitable for finish milling of K-type material
YD101		N05~25	Suitable for rough milling of N-type material
YD201		K15~35 N15~30	Suitable for rough and semi-finish milling of K-type material, and for rough milling of N-type material

Application case

Component shape			
Machine and cooling	Vertical machining center, wet machining	Plane milling machine, wet machining	plane milling machine, dry cutting
Workpiece material and hardness	Aluminum alloy HB100	40CrMnMo HB240	HT250 HB220
Type of machining	Milling surface	Milling surface	Milling surface
Applicable tool	FMA01-100-B32-SE12-07	FMP01-100-B32-TP22-06	FME03-160-B40-SP15-10
Applicable insert	YD101/SEET12T3-LH	YC30S/TPKN2204PDR	YD201/SPKN1504EDTR
Cutting parameters	Vc=300-350m/min, a_p=1~2mm, fz=0.2mm/z	Vc=170m/min, a_p=5~7mm fz=0.3mm/z	Vc=100-130m/min, a_p=7mm, fz=0.35mm/z
Application results			

Indexable milling tools code key

Cutter type	
FM	Face milling
EM	Square shoulder milling
HM	Helical end milling
SM	Side and face milling
BM	Profile milling
CM	Chamfer milling
XM	Special milling
TM	T-slot milling
AM	Aluminum alloy high speed milling

Approach angle		
P	90°	
E	75°	
D	60°	
A	45°	
R		

Series code

Cutting diameter ØD

Side and face milling tool : diameter X cutting edge width

Coupling structurebe (see below)

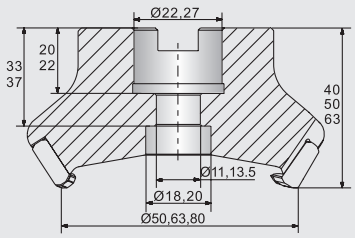
A	A-type coupling	XP	Weldon shank
B	B-type coupling	G	Straight shank
C	C-type coupling	MW	Morse adapter with a conical hole and without a flat tail
D	D-type coupling		

Coupling size(mm) (see below)

FM E 03 - 100 - B 32

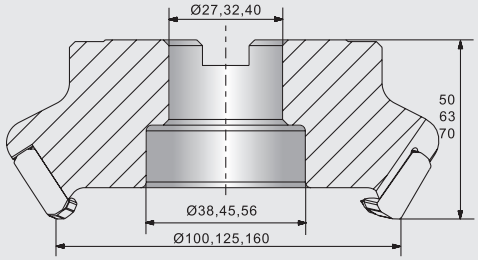
Coupling structure of arbor

A-type coupling



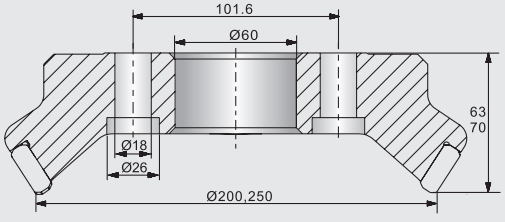
Ø50- Ø80 arbor face milling cutter as per GB5342-96

B-type coupling



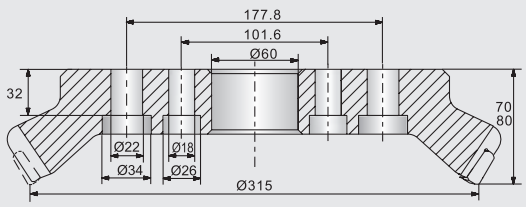
Ø100- Ø160 arbor face milling cutter as per GB5342-96

C-type coupling



Ø200- Ø250 arbor face milling cutter as per GB5342-96

D-type coupling



D≥Ø315 arbor face milling cutter as per GB5342-96

For coupling methods of Weldon shank, straight shank and Morse taper shank, etc., see technical information of tooling systems.

Insert shape	
80° C	55° D
R	S
60° T	L
H	O

Insert clearance angle	
N	0°
B	5°
C	7°
P	11°
D	15°
E	20°
F	25°

Length of cutting edge

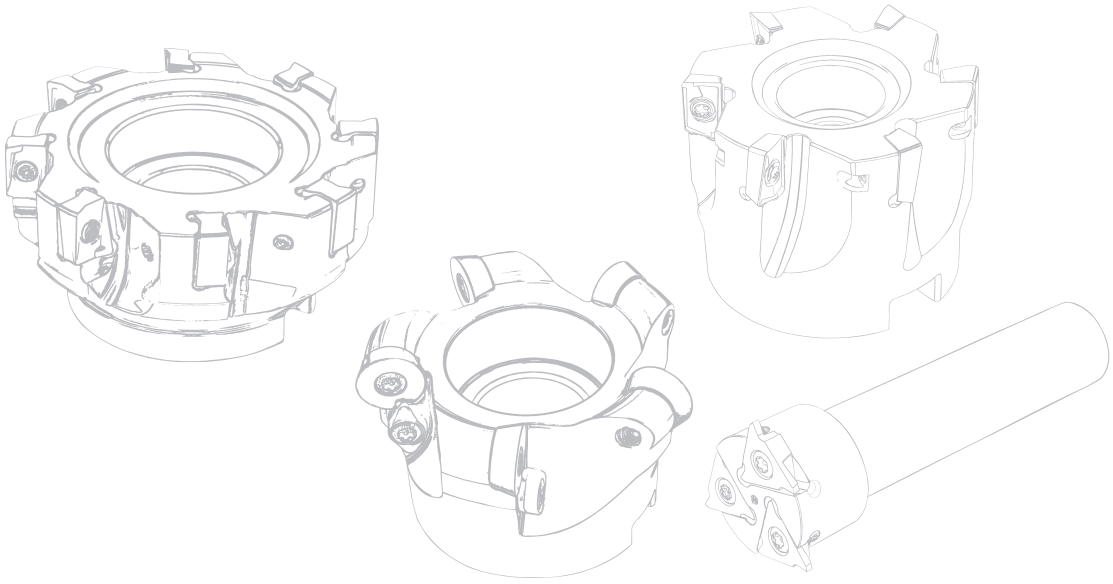
Diameter of insert's inscribed circle	Insert shape					
	C	D	R	S	T	L
5.556	—	—	—	—	09	—
6.350	06	07	—	—	11	—
9.525	09	11	09	09	16	—
12.700	12	15	12	12	22	—
15.875	16	19	15	15	27	—
19.050	19	—	19	19	33	—
25.400	25	—	25	25	44	2

-SP12-06LC

Number of teeth
(number of flute in the case of helical end mills)

Cutting direction
(R: Right L: Left R style as the default)

Internal cooling structure



Machining case of AMP01 series high-speed high-precision milling tools

Area of machining：Bottom surface of cylinder housing
Machine：Machining center
Coolant：Internal
Workpiece material：Aluminum alloy（HB 110）
Operation：Face milling
Cutting data：n= 11141r/min fz=0.1mm/z

●Comparison of tool life

Number of workpiece machined(pieces)

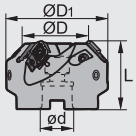
Results:：
ZCC-CT：12000 pcs
（Still usable）
Product of company A: 3500 pcs

AMA01 Series High-speed High-precision milling tools

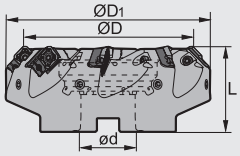
Kr:45° Face milling Chamfering

AMA01 N K

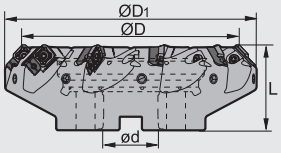
A-type coupling



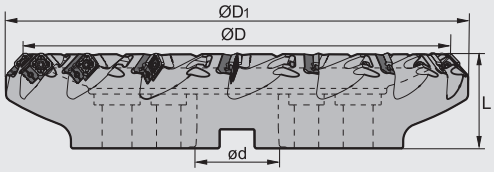
B-type coupling



C-type coupling



D-type coupling



Specification of tools

Type		Stock		Basic dimensions(mm)				Number of teeth Z	Type of coupling	Weight (kg)
		R	L	ØD	ØD1	ød	L			
AMA01	-050-A22-SE12-03C	▲	△	50	64	22	40	3	A	0.17
	-063-A27-SE12-04C	▲	△	63	77	27	40	4	A	0.27
	-080-A27-SE12-05C	▲	△	80	94	27	50	5	A	0.49
	-100-A32-SE12-06C	▲	△	100	114	32	50	6	A	0.84
	-125-B40-SE12-08C	▲	△	125	139	40	63	8	B	1.20
	-160-B40-SE12-10C	▲	△	160	173	40	63	10	B	2.11
	-160-C40-SE12-10C	▲	△	160	173	40	63	10	C	2.15
	-200-C60-SE12-12C	▲	△	200	213	60	63	12	C	3.36
	-250-C60-SE12-14C	▲	△	250	263	60	63	14	C	4.96
	-315-D60-SE12-16	▲	△	315	328	60	80	16	D	8.68
	-400-D60-SE12-18	▲	△	400	413	60	80	18	D	10.1
	-500-D60-SE12-20	▲	△	500	513	60	80	20	D	14.3

▲Stock available △Make-to-order

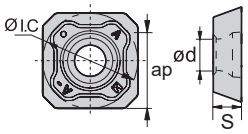
Cutter with a diameter of 250mm or more have no internal cooling, and cutter with a diameter of 200mm or more have no dynamic balance. Type A and Type B connectors are equipped with internal cooling screws.

Spare parts

Diameter ØD	Locator screw	Balancing screw	Adjusting screw	Insert screw	Locator	Wrench	Wrench
Ø50	M4×12-TP	M8×8(GB77-85)	I20M3×10X	I60M4×8.4	AMA0101	WT15IP	WT09P
Ø63							
Ø80		M8×12(GB77-85)			AMA0102	WT15IS	
Ø100-Ø160							
Ø200		--					
Ø250-Ø500		--			AMA0103		

Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Selection of inserts



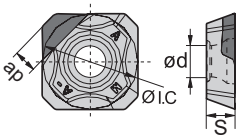
Good working condition Normal working condition Bad working condition

Workpiece material				
K	Cast iron		😊	☹
N	Non-ferrous metal	😐		😐

Insert shape	Type	Basic dimensions(mm)				PCD	PCBN	Cemented carbide
		ØI.C	S	ød	a_{pmax}	DN1021	BK1021	YD201
	**SEHT12T3AFFN-AL**	12.7	3.97	4.4	6.6			★

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Selection of inserts



Good working condition Normal working condition Bad working condition

Workpiece material				
K	Cast iron		😊	☹
N	Non-ferrous metal	😐		😐

Insert shape	Type	Basic dimensions(mm)				PCD	PCBN	Cemented carbide
		ØI.C	S	ød	a_{pmax}	DN1021	BK1021	YD201
	**SEHT12T308AFFN-PCD**	12.7	3.97	4.4	2.5	★		
	SEHT12T308AFFN-CBN	12.7	3.97	4.4	2		○	

CBN insert edge can be treated as per machining requirements ★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

Workpiece material		Insert material	Cutting parameters	
			V_c(m/min)	f_z(mm/z)
K	Cast iron	BK1021	800(500-1200)	0.2(0.1-0.5)
N	Aluminum alloy (Si content≤12%)	DN1021	1500(800-3000)	0.1(0.08-0.3)
		YD201	600(300-1000)	0.15(0.05-0.3)

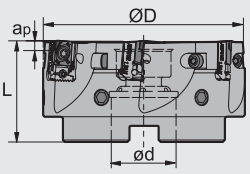
AMA01 Series High-speed High-precision milling tools

Kr:90° Face milling Step shoulder

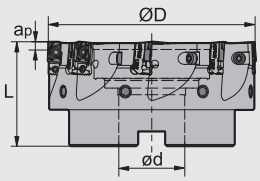
AMP01

Close even pitch

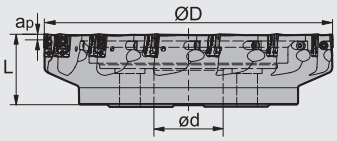
A-type coupling



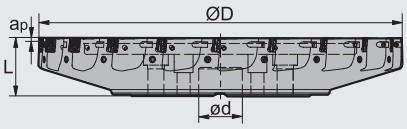
B-type coupling



C-type coupling



D-type coupling



Specification of tools

Type		Stock		Basic dimensions(mm)			Number of teeth Z	Type of coupling	Weight (kg)
		R	L	ØD	ød	L			
AMP01	-050-A22-AP12-03C	▲	△	50	22	40	3	A	0.17
	-063-A27-AP12-05C	▲	△	63	27	40	5	A	0.27
	-080-A27-AP12-06C	▲	△	80	27	50	6	A	0.49
	-100-A32-AP12-06C	▲	△	100	32	50	6	A	0.84
	-125-B40-AP12-08C	▲	△	125	40	63	8	B	1.20
	-160-B40-AP12-10C	▲	△	160	40	63	10	B	2.11
	-160-C40-AP12-10C	▲	△	160	40	63	10	C	2.15
	-200-C40-AP12-12C	▲	△	200	60	63	12	C	3.36
	-250-C60-AP12-14C	▲	△	250	60	63	14	C	4.96
	-315-D60-AP12-16	▲	△	315	60	80	16	D	8.68
	-400-D60-AP12-18	▲	△	400	60	80	18	D	10.1
	-500-D60-AP12-20	▲	△	500	60	80	20	D	14.3

▲Stock available △Make-to-order

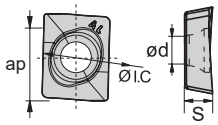
Cutter with a diameter of 250mm or more have no internal cooling, and cutter with a diameter of 200mm or more have no dynamic balance. Type A and Type B connectors are equipped with internal cooling screws.

Spare parts

Diameter ØD	Locator screw	Balancing screw	Adjusting screw	Insert screw	Locator	Wrench	Wrench
Ø50-Ø63	M4×12-TP	M8×8(GB77-85)	I20M3×10X	I60M4×8.4	AMP0101	WT15IP	WT09P
Ø80-Ø160		M8×12(GB77-85)			AMP0102	WT15IS	
Ø200		--					
Ø250-Ø500		--			AMP0103		

Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Selection of inserts



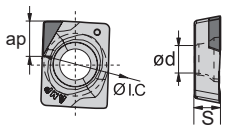
Good working condition Normal working condition Bad working condition

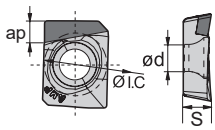
Workpiece material				
K	Cast iron		😊	☹
N	Non-ferrous metal	😐		😐

Insert shape	Type	Basic dimensions(mm)				PCD	PCBN	Cemented carbide
		ØI.C	S	ød	a_{pmax}	DN1021	BK1021	YD201
	**APHT12T304PPFR-AL**	12.7	3.97	4.4	12			★

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Selection of inserts





Good working condition Normal working condition Bad working condition

Workpiece material				
K	Cast iron		😊	☹
N	Non-ferrous metal	😐		😐

Insert shape	Type	Basic dimensions(mm)				PCD	PCBN	Cemented carbide
		ØI.C	S	ød	a_{pmax}	DN1021	BK1021	YD201
	**APHT12T304PPFR-PCD**	12.7	3.97	4.4	3	★		
	**APHT12T304PPFR-CBN**	12.7	3.97	4.4	2		○	
	**APHT12T304-W**	12.7	3.97	4.4	1	★	★	

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

Workpiece material		Insert material	Cutting parameters	
			V_c(m/min)	f_z(mm/z)
K	Cast iron	BK1021	800(500-1200)	0.2(0.1-0.5)
N	Aluminum alloy (Si content≤12%)	DN1021	1500(800-3000)	0.1(0.08-0.3)
		YD201	600(300-1000)	0.15(0.05-0.3)

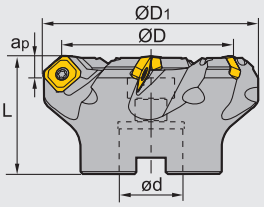
Face milling tools

Kr:45°

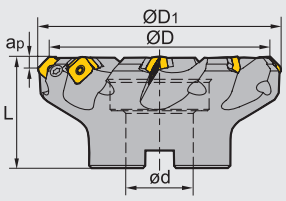
Face milling Chamfering

FMA01 P M K N S

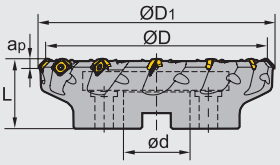
A-type coupling



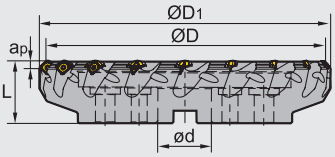
B-type coupling



C-type coupling



D-type coupling



Specification of tools

Type		Stock		Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
		R	L	ØD	ØD1	ød	L	apmax			
FMA01 Coarse pitch	**-050-A22-SE12-04**	▲	△	50	61	22	40	6	4	A	0.3
	-063-A22-SE12-05	▲	△	63	74	22	40	6	5	A	0.5
	-080-A27-SE12-06	▲	△	80	91	27	50	6	6	A	1.2
	-100-B32-SE12-07	▲	△	100	107	32	50	6	7	B	1.52
	-125-B40-SE12-08	▲	△	125	136	40	63	6	8	B	2.6
	-160-B40-SE12-07	▲	△	160	174	40	63	6	7	B	4.548
	-160-B40-SE12-10	▲	△	160	170	40	63	6	10	B	4.92
	-200-C60-SE12-08	▲	△	200	214	60	63	6	8	C	6.175
	-200-C60-SE12-12	▲	△	200	210	60	63	6	12	C	7.6
	-250-C60-SE12-10	▲	△	250	264	60	63	6	10	C	12.596
	-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
	-100-B32-SE18-04	▲	△	100	120	32	63	10.4	4	B	2.22
	-125-B40-SE18-05	▲	△	125	145	40	63	10.4	5	B	3.15
	-160-B40-SE18-06	▲	△	160	180	40	63	10.4	6	B	5.01
	-200-C60-SE18-08	▲	△	200	220	60	63	10.4	8	C	6.9
	-250-C60-SE18-10	▲	△	250	270	60	63	10.4	10	C	13.1
	-315-D60-SE18-12	▲	△	315	335	60	80	10.4	12	D	24.5

▲Stock available △Make-to-order

Spare parts

Diameter ØD	Insert	Insert screw	Shim	Shim screw	Wrench	Wrench
Ø50-Ø100	SEET12□□-□□	I60M3.5×10	--	--	WT15IS	--
Ø50-Ø315	SEET12□□-□□	I60M3.5×12	S13BS	SM5×7XA		WH35L
Ø100-Ø315	SEET18□□-□□	I60M5×17	S18BS	SM8×9XA	WT20IT	WH50L

Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Face milling tools

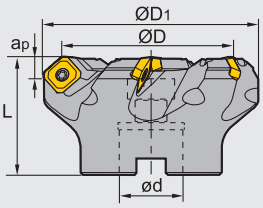
Kr:45°

Face milling Chamfering

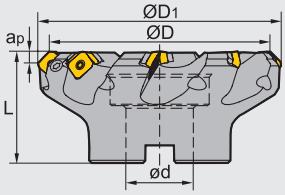
FMA01 P M K N S

Close and equal pitch

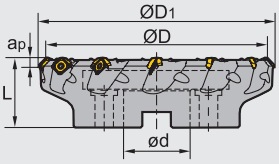
A-type coupling



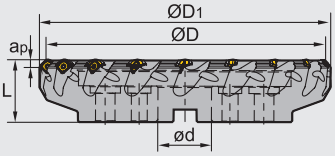
B-type coupling



C-type coupling



D-type coupling



Specification of tools

Type		Stock		Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
		R	L	ØD	ØD1	ød	L	apmax			
FMA01 Close pitch	**-050-A22-SE12-05**	▲	△	50	63	22	40	6	5	A	0.427
	-063-A22-SE12-06	▲	△	63	74	22	40	6	6	A	0.53
	-080-A27-SE12-08	▲	△	80	93	27	50	6	8	A	1.37
	-100-B32-SE12-10	▲	△	100	114	32	50	6	10	B	1.755
	-125-B40-SE12-12	▲	△	125	136	40	63	6	12	B	3.06
	-160-B40-SE12-16	▲	△	160	174	40	63	6	16	B	5.21
	-200-C60-SE12-20	▲	△	200	214	60	63	6	20	C	9.32
	-250-C60-SE12-24	▲	△	250	264	60	63	6	24	C	15.892
	-100-B32-SE18-06	▲	△	100	114	32	63	10.4	6	B	2.98
	-125-B40-SE18-07	▲	△	125	144	40	63	10.4	7	B	3.803
	-200-C60-SE18-12	▲	△	200	220	60	63	10.4	12	C	7.191
	-250-C60-SE18-14	▲	△	250	265	60	63	10.4	14	C	14.9

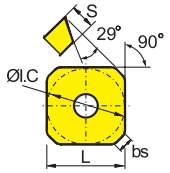
▲Stock available △Make-to-order

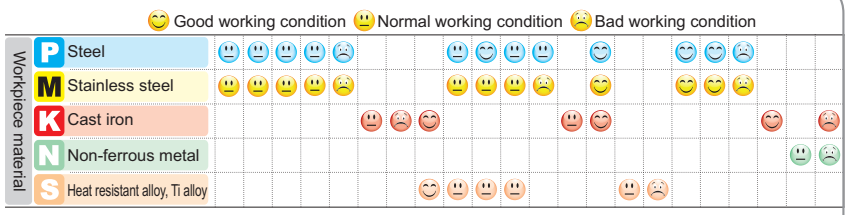
Spare parts

Diameter ØD	Insert	Insert screw	Shim	Shim screw	Wrench	Wrench
						
Ø50-Ø100	SEET12□□-□□	I60M3.5×10	--	--	WT15IS	--
Ø50-Ø315	SEET12□□-□□	I60M3.5×12	S13BS	SM5×7XA		WH35L
Ø100-Ø315	SEET18□□-□□	I60M5×17	S18BS	SM8×9XA	WT20IT	WH50L

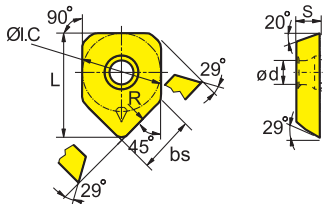
Tools code key B24–B25 Grade selection guide B19–B23 Technical data B234–B240

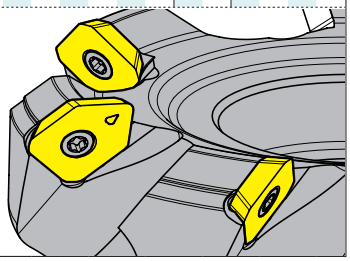
Selection of inserts



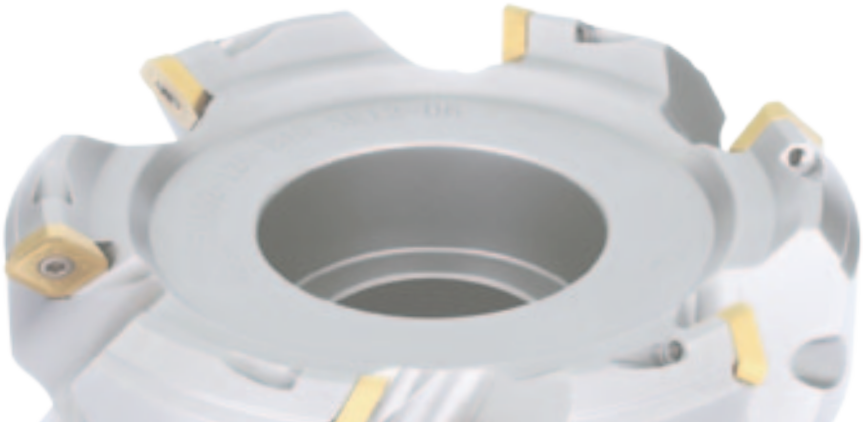


Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating									Cermet		Cemented carbide			
		L	ØI.C	S	ød	bs	R	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SEET12T3-DF	13.4	13.4	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	--			●		●					★		★				●						
	SEET18T6-DM	18.0	18.0	6.1	5.5	1.5	--		○		○																		
	SEET18T6-EM	18.0	18.0	6.1	5.5	1.5	--				○							○											
	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		★	●			★				★							★					
	SEET18T6-W	24.78	18.0	6.1	5.5	11.0	500										○												





★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order



Chipbreaker selection for FMA01 milling inserts

Classification \ Function	For finishing	For semi-finishing	For roughing
P	-DF	-DM	-DR
M, S	-EF	-EM	
K	-CF	-CM	-CR
N	-LH		

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters			
				V_c(m/min)	f_z(mm/z)		
					-DF	-DM	-DR
P	Low-carbon steel、Soft steel	≤180	YBM251 YBC301	270(220-350)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
			YBG205 YB9320	270(200-360)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
			YBG302 YBM253	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	180-280	YBM251 YBC302 YBC301	240 (200-320)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
			YBG205 YB9320	240 (180-350)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
			YBG302 YBM253	220 (150-330)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
	Alloy tool steel	280-350	YBM251 YBM351 YBC301	220 (180-300)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
			YBG205 YB9320	220 (170-340)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
			YBG302 YBM253	190 (130-300)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
M					-EF	-EM	
	Stainless steel	≤270	YBM251	150 (120-240)	0.15(0.1-0.2)	0.2 (0.1-0.3)	
			YBG205 YB9320	160 (110-270)	0.15(0.1-0.2)	0.2 (0.1-0.3)	
			YBG302	140 (100-250)	0.15(0.1-0.2)	0.2 (0.1-0.3)	
K					-CF	-CM	-CR
	Cast iron	180-250	YBG102	210 (120-300)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
			YBD152	240 (180-300)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
N					-LH		
	Al alloy steel	--	YD101	300-	0.25 (0.1-0.4)		
			YD201	300-			
S					-EF	-EM	
	High-temperature alloy	≤400	YBG102	50(20-60)	0.1 (0.1-0.2)	0.15 (0.1-0.3)	
			YBS303	100(60-120)	0.1 (0.1-0.2)	0.15 (0.1-0.25)	

Case for FMA01

Workpiece material：1Cr18Ni9Ti (HB180)
Cooling system： Dry cutting
Machine： Vertical machining center
Cutting parameters：
Vc=160m/min
a_p=1mm
fz=0.2mm/z
a_e=60mm

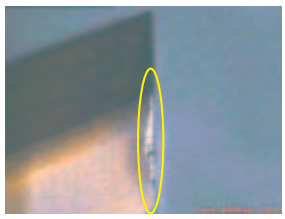
Tool type：FMA01-080-A27-SE12-06
Insert type/grade：SEET12T3-EM/YBG302

Surface roughness of workpiece:

ZCC-CT:Ra1.2

Similar overseas products：Ra1.6

●Comparison of insert abrasion

	ZCC-CT	Similar overseas products
17'30"		
29'30"		
33'30"		

Face milling tools

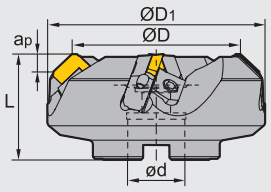
Kr:45°


Face milling

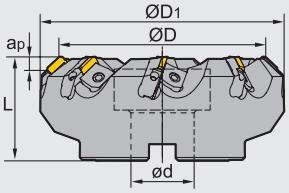

Chamfering

FMA03 P M K

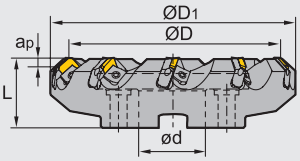
A-type coupling



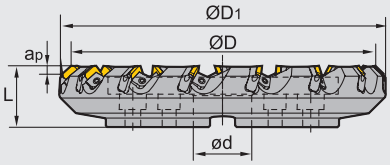
B-type coupling



C-type coupling



D-type coupling



Specification of tools

Type		Stock		Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
		R	L	ØD	ØD1	ød	L	apmax			
FMA03	**-080-A27-SE12-04**	▲	△	80	103	27	50	5.5	4	A	1.8
	-100-B32-SE12-05	▲	△	100	122	32	50	5.5	5	B	2.4
	-125-B40-SE12-06	▲	△	125	147	40	63	5.5	6	B	4.4
	-160-B40-SE12-08	▲	△	160	181	40	63	5.5	8	B	6.4
	-200-C60-SE12-10	▲	△	200	221	60	63	5.5	10	C	8.5
	-250-C60-SE12-12	▲	△	250	270	60	63	5.5	12	C	14.1
	-315-D60-SE12-15	▲	△	315	353	60	63	5.5	15	D	22.2
	-080-A27-SE15-04	▲	△	80	103	27	50	7.5	4	A	1.7
	-100-B32-SE15-05	▲	△	100	122	32	50	7.5	5	B	2.3
	-125-B40-SE15-06	▲	△	125	147	40	63	7.5	6	B	4.2
	-160-B40-SE15-08	▲	△	160	181	40	63	7.5	8	B	6.1
	-200-C60-SE15-10	▲	△	200	221	60	63	7.5	10	C	8.3
	-250-C60-SE15-12	▲	△	250	270	60	63	7.5	12	C	13.6
	-315-D60-SE15-15	▲	△	315	353	60	63	7.5	15	D	21.8

▲Stock available △Make-to-order

Spare parts

Diameter ØD	Inserts	Locator	Wedge	Wedge screw	Locator screw	Wrench
Ø80-Ø315	SE12	LSE12R/L	W05R/L	DM8×21X	LOM5×15.1	WT20T WH40T
Ø80-Ø315	SE15	LSE15R/L	W01R/L			

Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Face milling tools

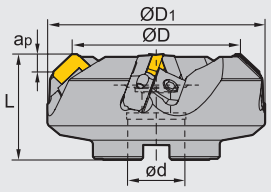
Kr:45°


Face milling

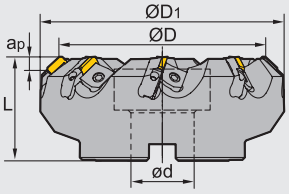

Chamfering

FMA03A P M K

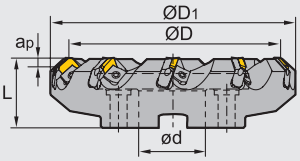
A-type coupling



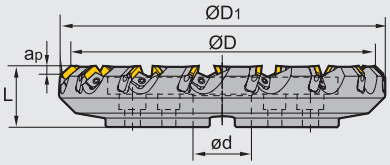
B-type coupling



C-type coupling



D-type coupling



Specification of tools

Type		Stock		Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
		R	L	ØD	ØD1	ød	L	apmax			
FMA03A	**-160-B2.00"-SE12-08R/L**	▲	△	160	177	2.00"	63	5.5	8	B	6.9
	-200-C1.875"-SE12-10R/L	▲	△	200	217	1.875"	63	5.5	10	C	9.1
	-250-C1.875"-SE12-12R/L	▲	△	250	267	1.875"	63	5.5	12	C	14.6
	-315-C1.875"-SE12-14R/L	▲	△	315	332	1.875"	63	5.5	14	C	22.7
	-350-C1.875"-SE12-16R/L	▲	△	350	367	1.875"	63	5.5	16	C	28.9
	-250-C1.875"-SE15-12R/L	▲	△	250	267	1.875"	63	7.5	12	C	7.3
	-315-C1.875"-SE15-14R/L	▲	△	315	340	1.875"	63	7.5	14	C	9.5
	-350-C1.875"-SE15-16R/L	▲	△	350	370	1.875"	63	7.5	16	C	15.1

▲Stock available △Make-to-order

1.875"=47.625mm 2.00"=50.8mm

Cutter diameter — Insert type — Left cutter

FMA03A - 160 - B2.00" - SE12 - 08R/L

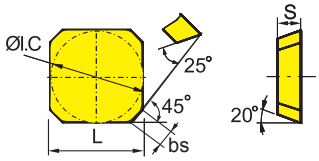
Cutter type — Coupling type — Right cutter

Spare parts

Diameter ØD	Inserts	Shim	Wedge	Wedge screw	Insert screw	Wrench
Ø160-Ø350	SE□□12□□□□ SE□□15□□□□	S15BSX	W27R/L	DM10X21X	M4X10-S12B	WH50T

Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Selection of inserts

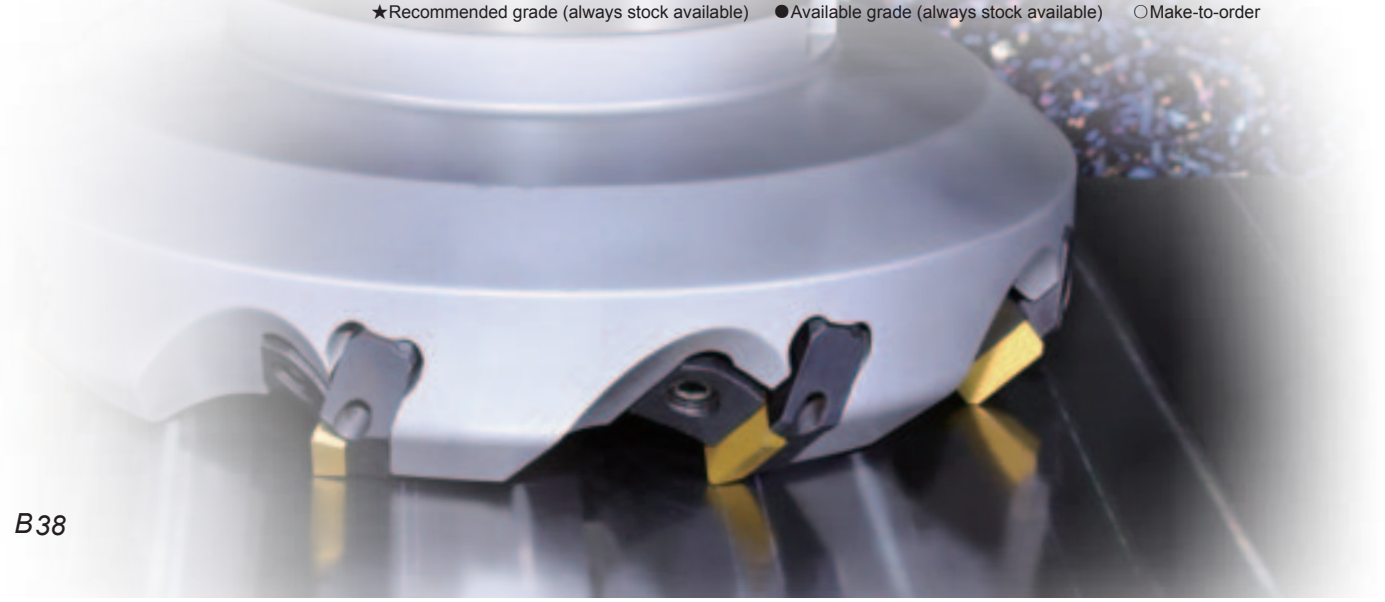


Good working condition Normal working condition Bad working condition

Workpiece material		YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
P	Steel	😐	😐	😐	😐	☹				😐	😊	😐	😐		😊			😊	😊	☹			
M	Stainless steel	😐	😐	😐	😐	☹				😐	😐	😐	☹		😊			😊	😊	☹			
K	Cast iron						😐	☹	😊					😐	😊						😊		☹
N	Non-ferrous metal																					😐	☹
S	Heat resistant alloy, Ti alloy								😊	😐	😐	😐				😐	☹						

Insert shape	Type	Basic dimensions(mm)				CVD Coating							PVD Coating									Cermet		Cemented carbide			
		L	ØI.C	S	bs	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	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	●								○			○										
	**SEMR1203AN-M**	12.7	12.7	3.3	-										●												
	**SEKR1203AN-M**	12.7	12.7	3.3	-										●												
	**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							★					★							●			
	**SEMR1504AN-M**	15.875	15.875	4.9	-										●												
	**SEKR1504AN-M**	15.875	15.875	4.9	-										●												

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order



Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				V_c(m/min)	f_z(mm/z)
P	Low-carbon steel、Soft steel	≤180	YNG151	430 (340-500)	0.2 (0.1-0.4)
			YBM251 YBC301 YBG205	270 (220-350)	0.2 (0.1-0.4)
			YBM351	220 (180-300)	0.25 (0.15-0.3)
			YBG202 YBG302	270 (200-360)	0.2 (0.1-0.3)
			YC30S	140 (100-220)	0.27 (0.1-0.4)
	High-carbon steel、Alloy steel	180-280	YNG151	400 (320-480)	0.2 (0.1-0.4)
			YBM251 YBC301 YBG205	240 (200-320)	0.2 (0.1-0.4)
			YBM351	200 (160-280)	0.25 (0.15-0.3)
			YBG202 YBG302	240 (180-350)	0.2 (0.1-0.3)
			YC30S	120 (80-200)	0.27 (0.1-0.4)
	Alloy tool steel	280-350	YNG151	350 (300-450)	0.2 (0.1-0.4)
			YBM251 YBC301 YBG205	220 (180-300)	0.2 (0.1-0.4)
			YBM351	180 (150-250)	0.25 (0.15-0.3)
			YBG202 YBG302	220 (170-340)	0.2 (0.1-0.3)
			YC30S	100 (60-180)	0.27 (0.1-0.4)
M	Stainless steel	≤270	YNG151	220 (160-280)	0.2 (0.1-0.4)
			YBM251 YBG205	130 (100-220)	0.2 (0.1-0.4)
			YBM351	140 (100-240)	0.25 (0.15-0.3)
			YBG202 YBG302	140 (100-250)	0.2 (0.1-0.3)
K	Cast iron	180-250	YBG102	210 (120-300)	0.2 (0.1-0.3)
			YBD252	200 (150-250)	0.2 (0.1-0.4)
			YD201	100 (80-160)	0.25 (0.1-0.4)

Face milling tools

Kr:45°

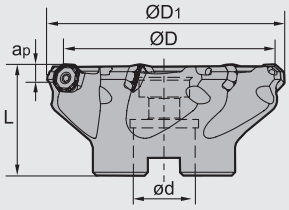

Face milling


Chamfering

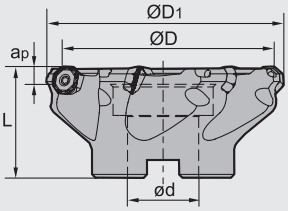
FMA04 P M K N

Screw clamping

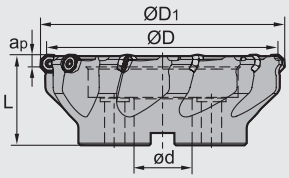
A-type coupling



B-type coupling



C-type coupling



Specification of tools

Type		Stock		Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
		R	L	ØD	ØD1	ød	L	apmax			
FMA04	**-050-A22-OF05-04**	▲	△	50	56	22	40	3.5	4	A	0.3
	-050-A22-OF05-05	△	△	50	56	22	40	3.5	5	A	0.4
	-063-A22-OF05-05	▲	△	63	69	22	40	3.5	5	A	0.5
	-080-A27-OF05-06	▲	△	80	86	27	50	3.5	6	A	0.8
	-100-B32-OF05-07	▲	△	100	106	32	50	3.5	7	B	1.2
	-125-B40-OF05-08	▲	△	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

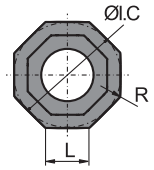
▲Stock available △Make-to-order

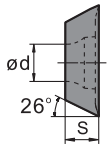
Spare parts

Diameter ØD	Insert screw	Wrench
Ø50- Ø63	I60M4×8.4	WT15IS
Ø80 -Ø160	I60M4×10	

Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Selection of inserts





Good working condition Normal working condition Bad working condition

Workpiece material	
P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	ØI.C	S	ød	R	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	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																				○	

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters		
				Vc(m/min)	fz(mm/z)	
					-DF	-DM
P	Low-carbon steel、Soft steel	≤180	YBM251	270 (220-350)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
			YBG202	270 (200-360)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
			YBG302 YB9320 YBG205	230 (170-350)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
	High-carbon steel、Alloy steel	180-280	YBM251	240 (200-320)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
			YBG202	240 (180-350)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
			YBG302 YB9320 YBG205	220 (150-330)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
	Alloy tool steel	280-350	YBM251	220 (180-300)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
			YBG202	220 (170-340)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
			YBG302 YB9320	190 (130-300)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
M	Stainless steel	≤270	YBG202	160 (110-270)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
			YBG302 YB9320 YBG205	140 (100-250)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
			YBM251	150 (120-250)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
K	Cast iron	180-250	YBG102 YBD152 YBD252	210 (120-300)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
N					-LH	
	Al alloy steel	-	YD101	300-	0.15 (0.05-0.3)	

Face milling tools

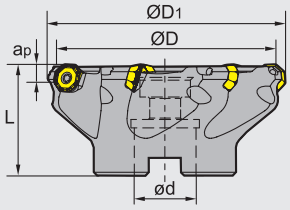
Kr:45°

Face milling Chamfering

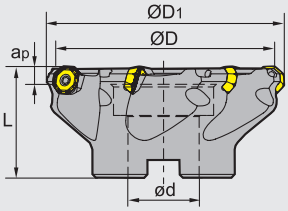
FMA04 P M K N S

Screw clamping

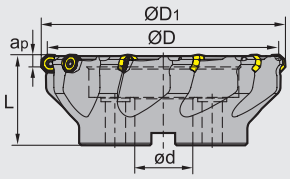
A-type coupling



B-type coupling



C-type coupling

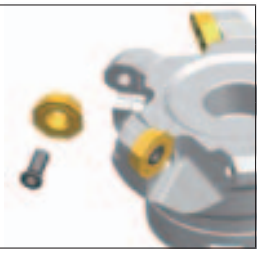


Specification of tools

Type		Stock		Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
		R	L	ØD	ØD1	ød	L	apmax			
FMA04 Coarse pitch	**-050-A22-OD06-04C**	▲	△	50	60	22	40	4	4	A	0.284
	-063-A22-OD06-05C	▲	△	63	73	22	40	4	5	A	0.409
	-080-A27-OD06-06C	▲	△	80	90	27	50	4	6	A	1.017
	-100-A32-OD06-07C	▲	△	100	110	32	50	4	7	A	1.536
	-125-B40-OD06-08	▲	△	125	135	40	63	4	8	B	2.931
	-160-C40-OD06-10	▲	△	160	170	40	63	4	10	C	3.838
Close pitch	**-050-A22-OD06-05C**	▲	△	50	60	22	40	4	5	A	0.298
	-063-A22-OD06-06C	▲	△	63	73	22	40	4	6	A	0.425
	-080-A27-OD06-07C	▲	△	80	90	27	50	4	7	A	1.025
	-100-A32-OD06-09C	▲	△	100	110	32	50	4	9	A	1.521
	-125-B40-OD6-10	▲	△	125	135	40	63	4	10	B	2.919
	-160-C40-OD6-12	▲	△	160	170	40	63	4	12	C	3.825

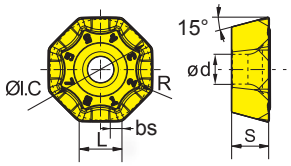
▲Stock available △Make-to-order

Spare parts

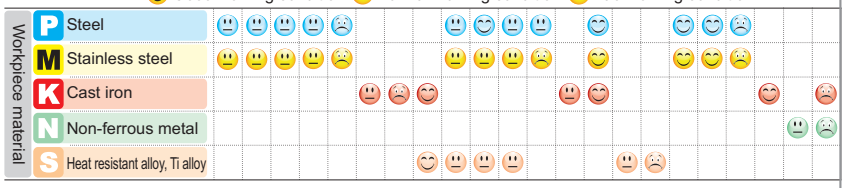
Diameter ØD	Insert screw	Wrench	
			
Ø50-Ø160	I60M5×13	WT20IP WT20IS	

Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Selection of inserts



Good working condition Normal working condition Bad working condition



Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	ØI.C	S	ød	R	bs	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**ODHT060508-GL**	6.5	15.875	5.56	5.4	0.8	1.6				●		●				●	●											
	**ODHT060508-GM**	6.5	15.875	5.56	5.4	0.8	1.6				●		●				●	●					●						
	**ODMT060512-GM**	6.5	15.875	5.56	5.4	1.2	--				●		●				●	●					●						
	**ODHT060508-GH**	6.5	15.875	5.56	5.4	0.8	1.6				●		●				●	●											
	**ODHT060508-LH**	6.5	15.875	5.56	5.4	0.8	1.6																					●	●

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Chipbreaker selection for FMA04 milling inserts

Classification \ Function	For finishing	For semi-finishing	Heavy-load machining
P	-GM	-GL	-GH
M	-GM	-GL	-GH
K	-GM	-GL	-GH
S	-GM	--	--
N	-LH		

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters			
				V_c(m/min)	f_z(mm/z)		
					-GL	-GM	-GH
P	Low-carbon steel、Soft steel	≤180	YBM253	270(220-350)	0.15 (0.1-0.2)	0.25 (0.15-0.35)	0.3 (0.15-0.4)
			YBG205	270(200-360)			
			YB9320	270(200-360)			
	High-carbon steel、Alloy steel	180-280	YBM253	240(200-320)	0.15 (0.1-0.2)	0.15 (0.1-0.3)	0.25 (0.15-0.4)
			YBG205	240(180-350)			
			YB9320	240(180-350)			
	Alloy tool steel	280-350	YBM253	220(180-200)	0.15 (0.1-0.2)	0.15 (0.1-0.3)	0.25 (0.15-0.4)
			YBG205	220(170-340)			
			YB9320	220(170-340)			
M	Stainless steel	≤270	YBM253	230(180-300)	0.15 (0.1-0.2)	0.15 (0.1-0.3)	0.25 (0.15-0.4)
			YBG205	150(120-250)			
			YB9320	150(120-250)			
K	Cast iron	180-250	YBD152	200(150-250)	0.15 (0.1-0.2)	0.25 (0.15-0.35)	0.3 (0.15-0.4)
S	High-temperature alloy	≤400	YBS303	100(60-120)	--	0.15 (0.1-0.25)	--
N					-LH		
	Aluminium alloy	--	YD101	300-	0.15 (0.05-0.3)		
			YD201				

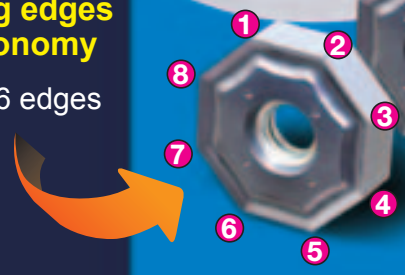
HURRICANE

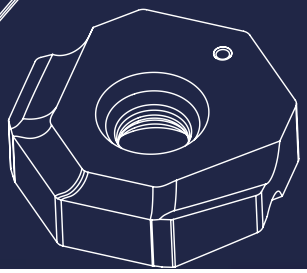
FMA07 milling cutter series

New generation of high economy milling cutters

16 cutting edges high economy

⑧×2=16 edges





- Double negative rake angle structure, both axial and radial direction, super thick insert with outstanding toughness.
- Has good wiper capability, especially under the high feed rate, the wiper effect is better in comparison with similar tools.
- The unique hole design makes the insert clamp more secured.
- Tool diameters from 25 to 315mm and 3 geometries available, -PF, -PM and -W (wiper).

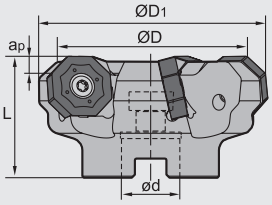
Face milling tools

Kr:45°

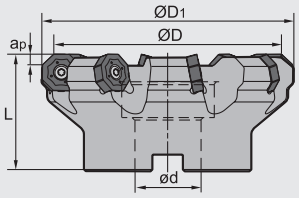
Face milling Chamfering

FMA07 P M K

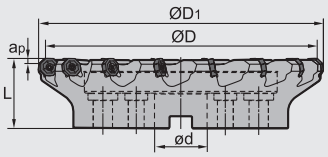
A-type coupling



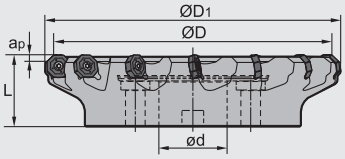
B-type coupling



C-type coupling



D-type coupling



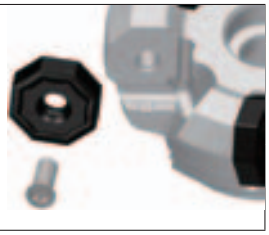
Specification of tools

Type		Stock		Basic dimensions(mm)					Number of teeth Z	Style of coupling	Weight (kg)
		R	L	ØD	ØD1	ød	L	apmax			
FMA07	-050-A22-ON06-05	▲	△	50	62	22	40	4	5	A	0.3
	-063-A22-ON06-06	▲	△	63	75	22	40	4	6	A	0.5
	-080-B27-ON06-07	▲	△	80	92	27	50	4	7	B	1.0
	-100-B32-ON06-08	▲	△	100	112	32	63	4	8	B	1.9
	-125-B40-ON06-09	▲	△	125	137	40	63	4	9	B	3.5
	-160-C40-ON06-11	▲	△	160	172	40	63	4	11	C	4.3
	-200-C60-ON06-13	▲	△	200	212	60	63	4	13	C	6.4
	-250-C60-ON06-15	▲	△	250	262	60	63	4	15	C	13.4
	-315-D60-ON06-17	▲	△	315	327	60	80	4	17	D	21.9
	-063-A22-ON08-05	▲	△	63	78	22	40	5	5	A	0.5
	-080-B27-ON08-06	▲	△	80	95	27	50	5	6	B	0.9
	-100-B32-ON08-07	▲	△	100	115	32	63	5	7	B	1.8
	-125-B40-ON08-08	▲	△	125	140	40	63	5	8	B	3.1
	-160-C40-ON08-10	▲	△	160	175	40	63	5	10	C	4.1
	-200-C60-ON08-12	▲	△	200	215	60	63	5	12	C	6.1
	-250-C60-ON08-14	▲	△	250	265	60	63	5	14	C	12.0
	-315-D60-ON08-16	▲	△	315	330	60	80	5	16	D	21.0

▲Stock available △Make-to-order

Spare parts

Diameter ØD	Inserts	Insert screw	Wrench	
				
Ø50 -Ø315	ONHU06□□□□-PF/PM	I60M4×10	--	WT15IS
Ø63 -Ø315	ONHU08□□□□-PF/PM/W	I60M5×13	WT20IT	--



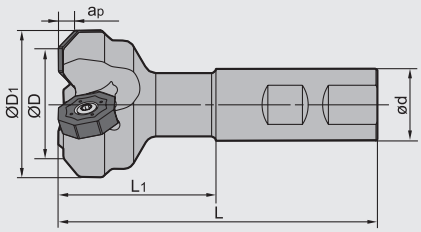
Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Face milling tools

Kr:45°

Face milling Chamfering

FMA07 P M K



Specification of tools

Type		Stock		Basic dimensions(mm)						Number of teeth Z	Weight (kg)
		R	L	ØD	$ØD_1$	ød	L	L_1	$a_p$max		
FMA07	-025-XP20-ON06-02	▲	△	25	37	20	95	45	4	2	0.2
	-040-XP25-ON06-03	▲	△	40	52	25	106	50	4	3	0.4
	-032-XP25-ON08-02	▲	△	32	47	25	111	55	5	2	0.4
	-040-XP25-ON08-03	▲	△	40	55	25	111	55	5	3	0.5
	-050-XP25-ON08-04	▲	△	50	65	25	111	55	5	4	0.6

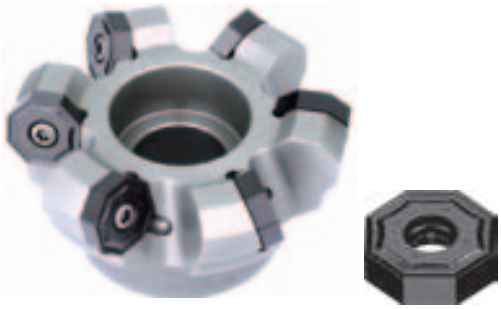
▲Stock available △Make-to-order

Spare parts

Diameter ØD	Inserts	Insert screw	Wrench	
Ø25 -Ø40	ONHU06□□□□-PF/PM	I60M4×10	--	WT15IS
Ø32 -Ø50	ONHU08□□□□-PF/PM/W	I60M5×13	WT20IT	--

Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

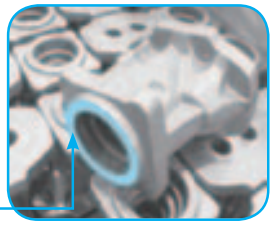
Case for FMA07



Tool type：FMA07-100-B32-ON08-07

Insert type/grade：ONHU08T508-PM/YBD152

Part: Gear pump body
Workpiece material：HT400
Hardness：HRC22
Cooling system: Dry cutting
Machine: Vertical machining center
Cutting parameters：V_c=267m/min
a_p=1.5mm
f_z=0.42mm/z
a_e=80mm
Milling style: Down milling
Area of machining: End surface



●Comparison of insert abrasion

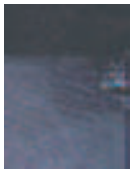
Abrasion on rake face

ZCC·CT

similar product of company A

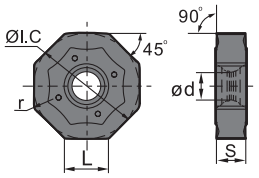
Abrasion on clearance face

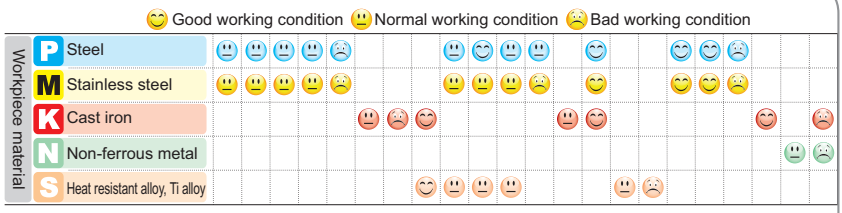
ZCC·CT



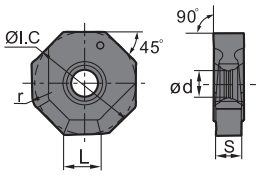
similar product of company A

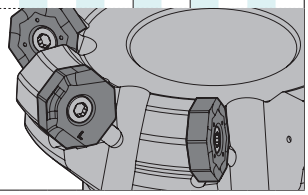
Selection of inserts





Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	ØI.C	S	ød	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**ONHU060408-PF**	6.58	15.875	4.76	4.4	0.83		★		●		★			★	★												
	ONHU08T508-PF	8.37	20.2	5.77	5.3	0.83		★		●		★			★	★	●											
	**ONHU060408-PM**	6.58	15.875	4.76	4.4	0.83		★		★		★		●		●												
	ONHU08T508-PM	8.37	20.2	5.79	5.3	0.83		★		★		★																
	**ONHU08T508-W**	6.9	20.5	6.00	5.3	0.80		★				★		★														





★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters		
				V_c(m/min)	f_z(mm/z)	$a_p$max(mm)
P	Low-carbon steel、Soft steel	≤180	YBG102 YBM253 YBG202 YBC302 YBG205 YB9320	270 (220-350)	0.2 (0.1-0.4)	4.0 (ONHU06) 5.0 (ONHU08)
P	High-carbon steel、Alloy steel	180-280	YBG102 YBM253 YBG202 YBC302 YBG205 YB9320	260 (200-320)	0.2 (0.1-0.4)	
P	Alloy tool steel	280-350	YBG102 YBM253 YBG202 YBC302 YBG205 YB9320	240 (180-300)	0.2 (0.1-0.4)	
M	Stainless steel	≤270	YBM253 YBG205 YB9320	230(180-300)	0.2(0.1-0.3)	
K	Cast iron	180-250	YBD152	270 (150-300)	0.4 (0.1-0.5)	

Note: The recommended feed rate per tooth for inserts with wiper fz≤0.25mm/z.

FMA11 Kr:45° Series

With outstanding economy and high performance

4 × 2=8 edge

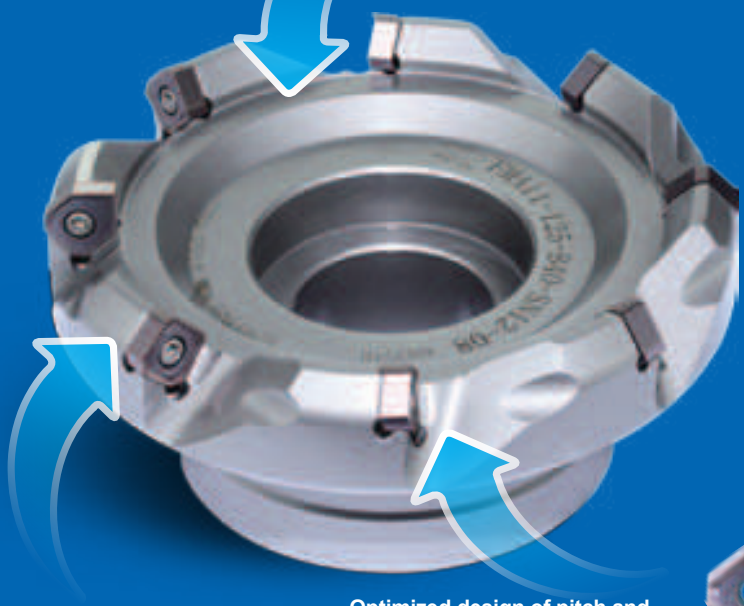
Cutter body with PVD coating for superior corrosion and heat resistance resulting in longer service life.

Comprehensive upgrading of -GM geometry, good chip breaking performance, large rake angle, reduced cutting force.

New -HGR geometry, high edge strength, excellent breakage resistance.

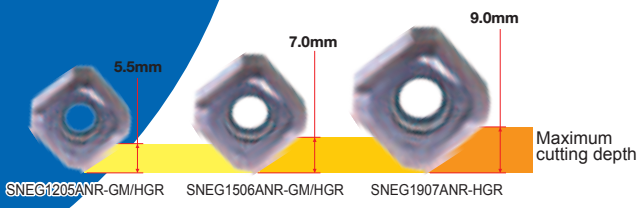
Insert with wiper, smoother surface roughness.

Complete range of insert specifications and geometries, for different cutting depths and different machining demands.



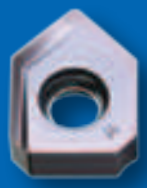
Double negative structure, excellent impact resistance.

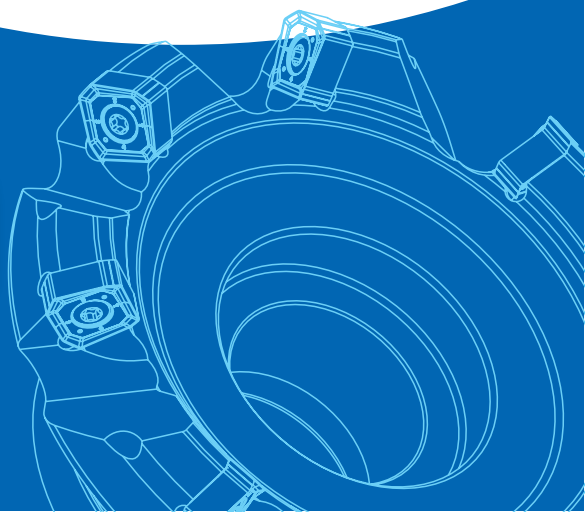
Optimized design of pitch and chip pocket, for unobstructed chip flow, and higher cutting efficiency.



-W special wiper geometry, wiper designed with large arc to improve surface quality the workpiece;

Large effective wiper length, more suitable for semi-finishing/finishing of large-diameter cutter heads.





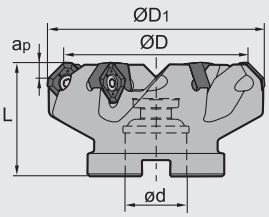
Face milling tools

Kr:45°

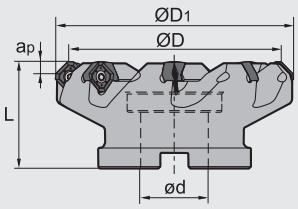
Face milling Chamfering

FMA11 P K M S

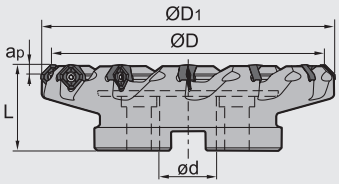
A-type coupling



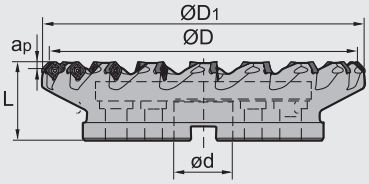
B-type coupling



C-type coupling



D-type coupling



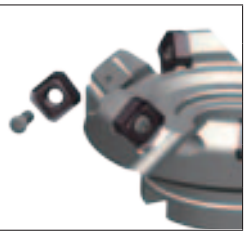
Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Style of coupling	Weight (kg)
		R	ØD	ØD1	ød	L	apmax			
FMA11 Coarse pitch	**-063-A22-SN12-05C**	▲	63	75.2	22	40	5.5	5	A	0.55
	-080-A27-SN12-06C	▲	80	92.2	27	50	5.5	6	A	1.14
	-100-B32-SN12-07	▲	100	112.2	32	50	5.5	7	B	1.42
	-125-B40-SN12-08	▲	125	137.2	40	63	5.5	8	B	2.86
	-160-C40-SN12-10	▲	160	172.2	40	63	5.5	10	C	4.06
	-063-A22-SN15-05C	▲	63	78.4	22	40	7.0	5	A	0.56
	-080-A27-SN15-06C	▲	80	95.4	27	50	7.0	6	A	1.06
	-100-B32-SN15-07	▲	100	115.4	32	50	7.0	7	B	1.47
	-125-B40-SN15-08	▲	125	140.4	40	63	7.0	8	B	2.70
	-160-C40-SN15-10	▲	160	175.4	40	63	7.0	10	C	3.92
	-200-C60-SN15-12	▲	200	215.4	60	63	7.0	12	C	5.46
	-250-C60-SN15-14	▲	250	265.4	60	63	7.0	14	C	11.26
	-315-D60-SN15-18	▲	315	330.4	60	80	7.0	18	D	20.00
	-125-B40-SN19-07	▲	125	144.4	40	63	9.0	7	B	3.00
	-160-C40-SN19-09	▲	160	179.4	40	63	9.0	9	C	4.25
	-200-C60-SN19-11	▲	200	219.4	60	63	9.0	11	C	6.18
	-250-C60-SN19-13	▲	250	269.4	60	63	9.0	13	C	11.55
	-315-D60-SN19-16	▲	315	334.4	60	80	9.0	16	D	20.90

▲Stock available △Make-to-order

Spare parts

Diameter ØD	Inserts	Insert screw	Wrench	
Ø63 -Ø160	SNEG1205ANR-GM/HGR/W	I60M3.5×10	--	WT15IS
Ø63 -Ø315	SNEG1506ANR-GM/HGR/W	I60M5×13	WT20IT	--
Ø125 -Ø315	SNEG1907ANR-HGR	I43M6×16	WT25IT	--



Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

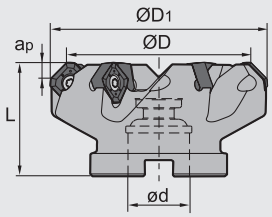
Face milling tools

Kr:45°

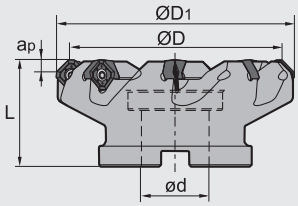
Face milling Chamfering

FMA11 P K M S

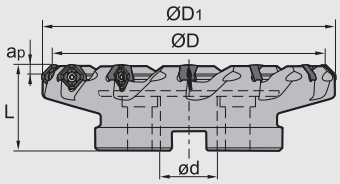
A-type coupling



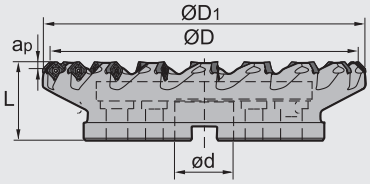
B-type coupling



C-type coupling



D-type coupling



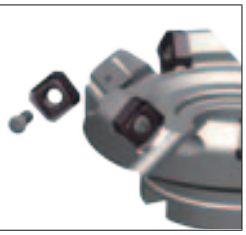
Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Style of coupling	Weight (kg)
		R	ØD	ØD1	ød	L	apmax			
FMA11 Close pitch	**-063-A22-SN12-06C**	▲	63	74.2	22	40	5.5	6	A	0.58
	-080-A27-SN12-08C	▲	80	91.9	27	50	5.5	8	A	1.16
	-100-B32-SN12-10C	▲	100	111.2	32	50	5.5	10	B	1.71
	-125-B40-SN12-12C	▲	125	136.2	40	63	5.5	12	B	3.29
	-160-C40-SN12-15	▲	160	171.6	40	63	5.5	15	C	4.40
	-063-A22-SN15-06C	▲	63	78.3	22	40	7.0	6	A	0.56
	-080-A27-SN15-07C	▲	80	95.3	27	50	7.0	7	A	1.05
	-100-B32-SN15-08C	▲	100	115.3	32	50	7.0	8	B	1.67
	-100-B32-SN15-09C	▲	100	115.3	32	50	7.0	9	B	1.67
	-125-B40-SN15-10C	▲	125	140.3	40	63	7.0	10	B	3.10
	-160-C40-SN15-12	▲	160	175.3	40	63	7.0	12	C	4.20
	-160-C40-SN15-13	▲	160	175.3	40	63	7.0	13	C	4.14
	-200-C60-SN15-15	▲	200	215.3	60	63	7.0	15	C	5.84
	-250-C60-SN15-18	▲	250	265.3	60	63	7.0	18	C	11.68
	-315-D60-SN15-22	▲	315	330.3	60	80	7.0	22	D	20.59

▲Stock available △Make-to-order

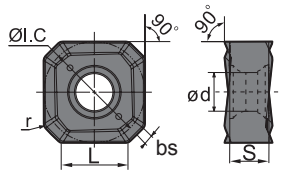
Spare parts

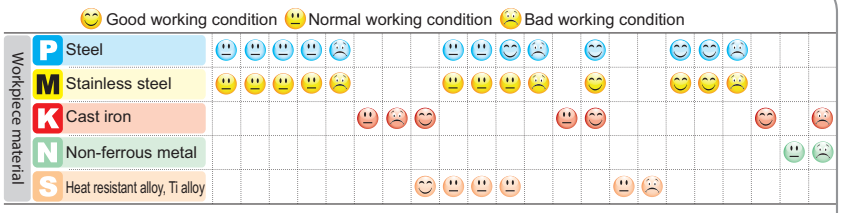
Diameter ØD	Inserts	Insert screw	Wrench	
Ø63 -Ø160	SNEG1205ANR-GM/HGR/W	I60M3.5×10	--	WT15IS
Ø63 -Ø315	SNEG1506ANR-GM/HGR/W	I60M5×13	WT20IT	--
Ø125 -Ø315	SNEG1907ANR-HGR	I43M6×16	WT25IT	--

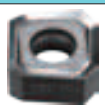


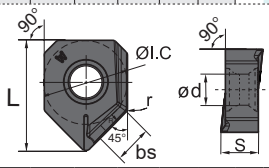
Tools code key B24–B25 Grade selection guide B19–B23 Technical data B234–B240

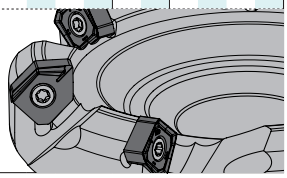
Selection of inserts





Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	ØI.C	S	bs	ød	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**SNEG1205ANR-GM**	7.6	12.0	4.76	1.05	4.6	0.8		★		★		★				★	★					○						
	SNEG1506ANR-GM	9.4	15.0	5.54	1.30	5.5	0.9		★		★		★				★	★					○						
	**SNEG1205ANR-HGR**	7.6	12.0	4.76	1.05	4.6	0.8		★		★			○			★	★											
	SNEG1506ANR-HGR	9.4	15.0	5.54	1.30	5.5	0.9		★		★			○			★	★											
	SNEG1907ANR-HGR	12.1	19.0	7.0	1.67	7.2	1.0		★		★			○			★	★											
	**SNEG1205ANR-W**	15.9	12.0	4.76	4.07	4.6	0.6										●												
	SNEG1506ANR-W	19.9	15.0	5.54	4.97	5.5	0.9										●												





★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters		
				V_c(m/min)	f_z(mm/z)	a_{pmax}(mm)
P	Low-carbon steel、Soft steel	⩽180	YBM253 YBC302 YBG205 YB9320	270 (220-350)	0.2 (0.1-0.4)	5.5(SN12) 7.0(SN15) 9.0(SN19)
P	High-carbon steel、Alloy steel	180-280	YBM253 YBC302 YBG205 YB9320	260 (200-320)	0.2 (0.1-0.4)	
P	Alloy tool steel	280-350	YBM253 YBC302 YBG205 YB9320	240 (180-300)	0.2 (0.1-0.4)	
K	Cast iron	180-250	YBD152	270 (150-300)	0.3(0.1-0.5)	
K			YBD252	200 (150-250)	0.4 (0.2-0.6)	
M	Stainless steel	⩽70	YBG205 YB9320	220 (160-250)	0.2 (0.1-0.4)	
M			YBM253	230 (180-300)	0.25 (0.15-0.35)	
S	High-temperature alloy	⩽400	YBS203 YBS303	100 (60-120)	0.15 (0.08-0.3)	

Case for FMA11

Workpiece material: NAK80
Operation: Face milling
Tool: FMA11-125-B40-SN12-08
Insert: SNEG1205ANR-HGR/YBG205
Cutting parameters: Vc=200m/min, fz=0.2mm/z,
Ap=2mm, Ae=50mm

●Tool Life Comparison

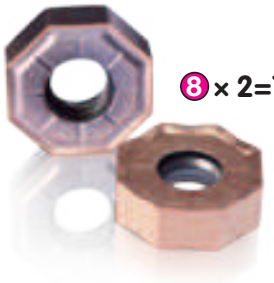
	Product of company A	-HGR/YBG205
Test Group 1		
Life	22 minutes	35 minutes wear 0.02mm
Test Group 1		
Life	27 minutes	35 minutes wear 0.01mm

FMA12 Series

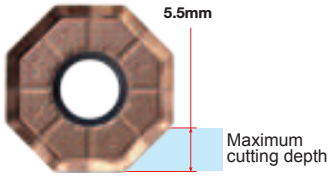
Kr:45°

High Performance Face Mill with 16 edges for outstanding economy

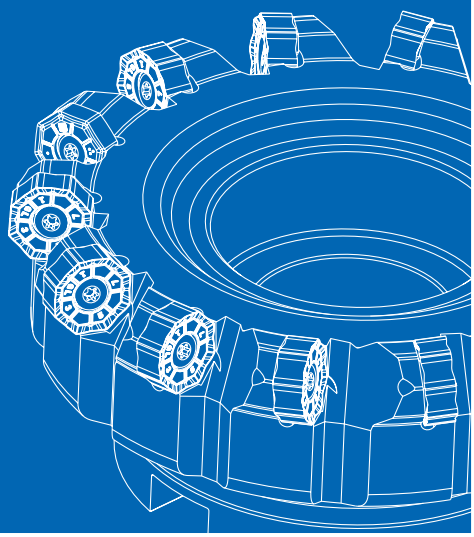
Double negative rake angle, in combination with helical insert structure, achieves double positive axial angle, which will help reduce cutting resistance and improve chip evacuation.



8 × 2=16 edges



ONHU09T508ANN-GM



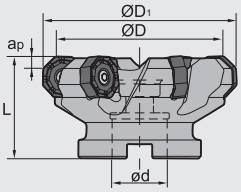
Face milling tools

Kr:45°

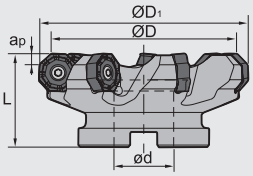
Face milling Chamfering

FMA12 P M K S

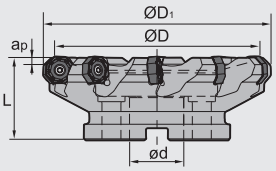
A-type coupling



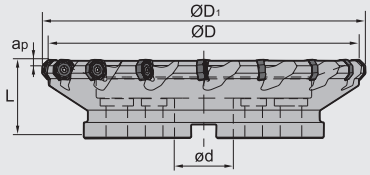
B-type coupling



C-type coupling



D-type coupling



Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Style of coupling	Weight (kg)
			ØD	ØD1	ød	L	apmax			
FMA12 Coarse pitch	**-050-A22-ON06-04C**	△	50	59	22	40	4	4	A	0.309
	-063-A27-ON06-05C	△	63	72	27	50	4	5	A	0.645
	-080-A27-ON06-07C	△	80	90	27	50	4	7	A	1.071
	-100-A32-ON06-08C	△	100	110	32	50	4	8	A	1.599
	-125-B40-ON06-10	△	125	135	40	63	4	10	B	3.114
	-160-C40-ON06-12	△	160	170	40	63	4	12	C	4.504
	-200-C60-ON06-18	▲	200	210	60	63	4	18	C	6.35
	-250-C60-ON06-20	▲	250	260	60	63	4	20	C	12.47
	-315-D60-ON06-22	▲	315	325	60	80	4	22	D	21.25
	-400-D60-ON06-28	▲	400	410	60	80	4	28	D	39.78
	-063-A22-ON09-04C	▲	63	76	22	50	5.5	4	A	0.7
	-080-A27-ON09-05C	▲	80	93	27	50	5.5	5	A	1.1
	-100-A32-ON09-06C	▲	100	113	32	50	5.5	6	A	1.6
	-125-B40-ON09-08	△	125	138	40	63	5.5	8	B	3.1
	-160-C40-ON09-10	△	160	173	40	63	5.5	10	C	3.982
	-200-C60-ON09-12	△	200	303	60	63	5.5	12	C	4.987
	-250-C60-ON09-16	△	250	260	60	63	5.5	16	C	11.89
	-315-D60-ON09-20	△	315	325	60	80	5.5	20	D	20.97
	-400-D60-ON09-24	△	400	410	60	80	5.5	24	D	38.69

▲Stock available △Make-to-order

Face milling tools

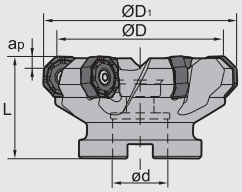
Kr:45°


Face milling

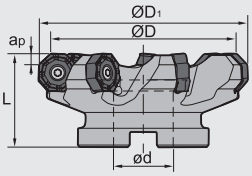

Chamfering

FMA12 P M K S

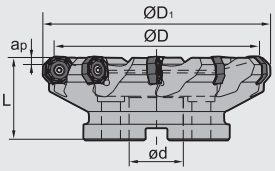
A-type coupling



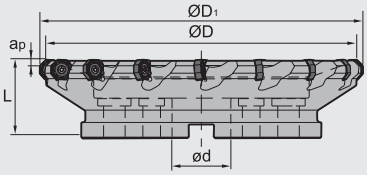
B-type coupling



C-type coupling



D-type coupling



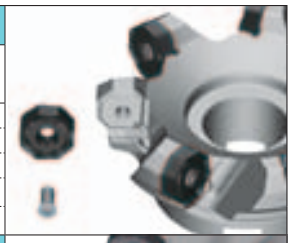
Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Style of coupling	Weight (kg)
			ØD	ØD1	ød	L	apmax			
FMA12 Coarse pitch	**-050-A22-ON06-05C**	△	50	59	22	40	4	5	A	0.352
	-063-A27-ON06-07C	△	63	72	27	50	4	7	A	0.695
	-080-A27-ON06-09C	△	80	90	27	50	4	9	A	1.098
	-100-A32-ON06-11C	△	100	110	32	50	4	11	A	1.616
	-125-B40-ON06-14	△	125	135	40	63	4	14	B	3.151
	-160-C40-ON06-18	△	160	170	40	63	4	18	C	4.568
	-063-A22-ON09-06C	▲	63	76	22	50	5.5	6	A	0.84
	-080-A27-ON09-07C	▲	80	93	27	50	5.5	7	A	1.24
	-100-A32-ON09-10C	▲	100	113	32	50	5.5	10	A	1.809
	-125-B40-ON09-12C	▲	125	138	40	63	5.5	12	B	3.648
	-160-C40-ON09-15	▲	160	173	40	63	5.5	15	C	4.303
	-200-C60-ON09-18	▲	200	303	60	63	5.5	18	C	5.754
	-125-B40-ON06-14W2	▲	125	138	40	63	4	12+2	B	3.626
	-160-B40-ON06-18W3	△	160	173	40	63	4	15+3	B	4.787
	-200-C60-ON06-24W4	△	200	303	60	63	4	20+4	C	6.231

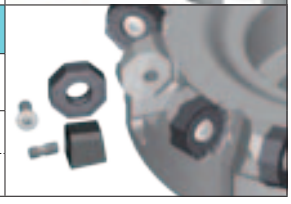
▲Stock available △Make-to-order

Spare parts

Diameter ØD	Inserts	Insert screw	Wrench
			
Ø50-Ø63	ONMU06□□□□-GM/GH ONHU06□□□□ANN-GM/GH/GL	IRM4X10	WT15IP
Ø80-Ø125			WT15IS
Ø160			WT15IT
Ø63-Ø125	ONMU09□□□□-GM/GH ONHU09□□□□ANN-GM/GH/GL	I60M5X13	WT20IS
Ø160-Ø400			WT20IT

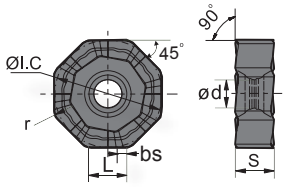


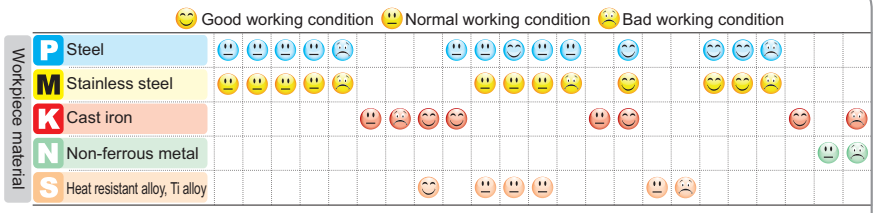
Diameter ØD	Inserts	Insert screw	Adjustment block	Insert screw	Wrench
					
Ø125	ONMU06□□□□-GM/GH ONHU06□□□□ANN-GM/GH/GL ONHU0604AN-W	DM6X20A	ADJ-M6X1.0A	IRM4X10	WT15IS
Ø160-Ø200					WT15IT



Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Selection of inserts





Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating									Cermet		Cemented carbide			
		L	ØI.C	S	ød	r	bs	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG105	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	ONHU060404ANN-GL	6.15	15.875	5.54	6	0.4	1.2				●		●					●	●					●						
	ONHU09T508ANN-GL	8.0	20.2	5.8	7	0.8	1.2				●		●					●	●					●						
	ONHU060408ANN-GM	6.15	15.875	5.54	6	0.8	1				●		●					●	●					●						
	ONMU060408-GM	6.15	15.875	5.54	6	0.8	-				●		●					●	●											
	ONHU09T508ANN-GM	8.0	20.2	5.8	7	0.8	1.2				●		●					●	●					●						
	ONMU09T512-GM	8.0	20.2	5.8	7	1.2	-				●		●					●	●											
	ONMU060408-GH	6.15	15.875	5.54	6	0.8	-				●		●					●	●					●						
	ONHU060408ANN-GH	6.15	15.875	5.54	6	0.8	1				●		●					●	●					●						
	ONHU09T508ANN-GH	8.0	20.2	5.8	7	0.8	1.2				●		●					●	●					●						
	ONMU09T512-GH	8.0	20.2	5.8	7	1.2	-				●		●					●	●											
	ONHU0604AN-W	6.15	15.875	4.97	6	0.8	-									●														

●Inserts are suitable for both left and right cuts

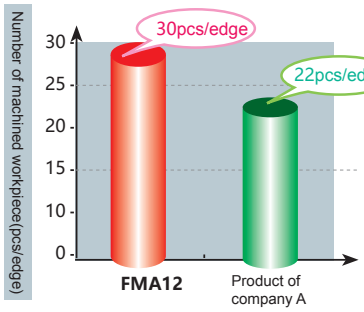
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters		
				V_c(m/min)	f_z(mm/z)	a_{pmax}(mm)
P	Low carbon steel	≤180	YBM253 YBG205 YB9320	270(220-350)	0.2(0.1-0.3)	4.0(0N06) 5.5(0N09)
P	Alloy steel	180-350	YBM253 YBG205 YB9320	240(180-320)	0.15(0.1-0.3)	
M	Stainless steel	≤270	YBM253 YBG205 YB9320	230 (180-300) 160 (110-270)	0.15 (0.1-0.3)	
K	Cast iron	180-260	YBD152	270(150-300)	0.2(0.1-0.3)	
S	Hard-to-cut material	≤400	YBS303	100(60-120)	0.15 (0.08-0.3)	

Case for FMA12

Workpiece: Elevator brake
Workpiece material: Alloy steel (HB190-240)
Machining location: Panel
Tool: FMA12-160-C40-ON09-10
Insert: ONHU09T508ANN-GM/YB9320
Cutting data: V_c=300m/min, f_z=0.25mm/z, a_p=3.5mm, a_e=120mm
System of cooling: External

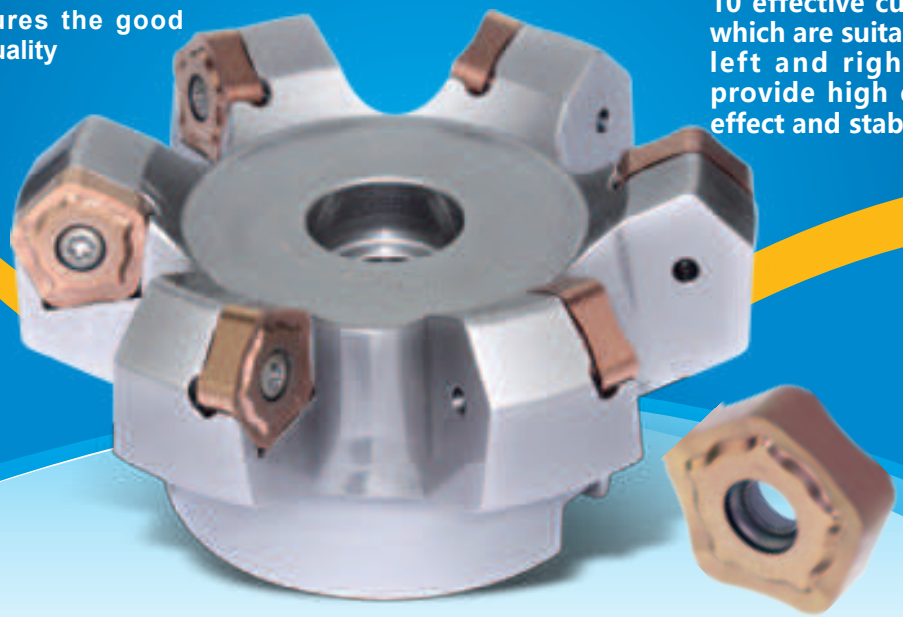


Tool Life comparison
Being compared to the similar product of company A, our FMA12 has longer cutting tool life.

FMA14

The general milling cutter with high-effective multiple cutting edges

- The balanced design with 45 clearance angle to achieve low cutting resistance for high-effective machining
- The upgraded new design of the chipbreaker which is suitable for different machining of steel and nodular cast iron
- The great anti-vibration tool ensures the good surface quality
- The pentagon design with 10 effective cutting edges which are suitable for both left and right cut, also provide high economical effect and stability



The helical cutting edge design could reduce cutting resistance to achieve light cut

The optimized chipbreaker design ensures the strength which significantly reduces the cutting edge breakage risk.

The abundant chipbreaker series could deal with different machining condition

-GL: Emphasis on stable machining

Suitable for low cutting forces and the insufficient machine load situation

-GM: First choice for P material machining

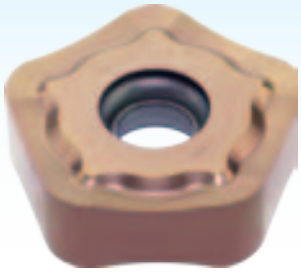
The large radius cutting edge with optimized cutting edge design

-GH: Emphasis on anti-breakage machining

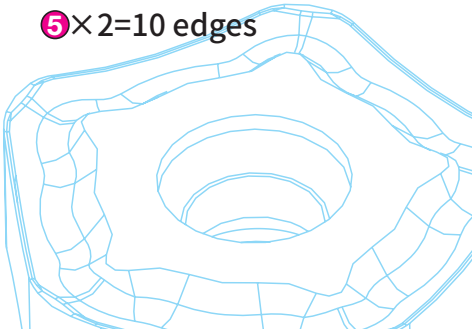
The high strength of the cutting edge significantly control the breakage risks

To combine with new grade YB9320 to achieve long tool life and stable machining

-GL/-GM/-GH



5×2=10 edges



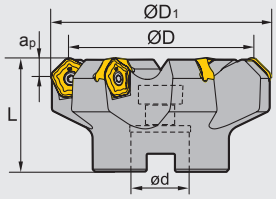
Face milling tools

Kr:45°

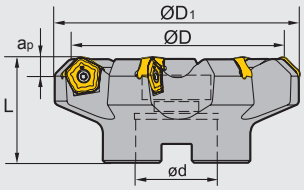
Face milling Chamfering

FMA14 P M K

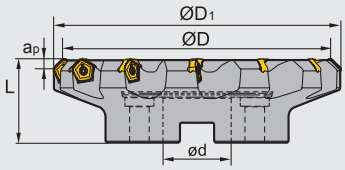
A-type coupling



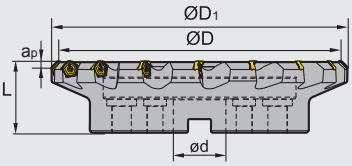
B-type coupling



C-type coupling



D-type coupling



Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Style of coupling	Weight (kg)
			ØD	ØD1	L	ød	apmax			
FMA14 Coarse pitch	**-050-A22-PN11-04**	▲	50	66.7	50	22	5.5	4	A	0.571
	-063-A22-PN11-05	▲	63	79.7	50	22	5.5	5	A	0.77
	-080-A27-PN11-06	▲	80	96.7	50	27	5.5	6	A	1.09
	-100-B32-PN11-07	▲	100	116.7	50	32	5.5	7	B	1.48
	-125-B40-PN11-08	▲	125	141.7	63	40	5.5	8	B	3.39
	-160-B40-PN11-10	▲	160	176.7	63	40	5.5	10	B	5.93
	-200-C60-PN11-12	▲	200	216.7	63	60	5.5	12	C	6.28
	-250-C60-PN11-14	▲	250	266.7	63	60	5.5	14	C	11.84
	-315-D60-PN11-16	▲	315	331.7	80	60	5.5	16	D	19.8
Close pitch	**-050-A22-PN11-05**	▲	50	66.7	50	22	5.5	5	A	0.6
	-063-A22-PN11-06	▲	63	79.7	50	22	5.5	6	A	0.9
	-080-A27-PN11-08	▲	80	96.7	50	27	5.5	8	A	1.2
	-100-B32-PN11-10	▲	100	116.7	50	32	5.5	10	B	1.9
	-125-B40-PN11-12	▲	125	141.7	63	40	5.5	12	B	3.5
	-160-B40-PN11-14	▲	160	176.7	63	40	5.5	14	B	6.4
	-200-C60-PN11-16	▲	200	216.7	63	60	5.5	16	C	8.5
	-250-C60-PN11-18	▲	250	266.7	63	60	5.5	18	C	18.0
	-315-D60-PN11-26	▲	315	331.7	80	60	5.5	26	D	24.5

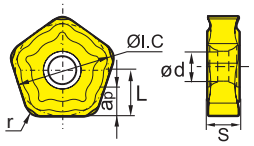
▲Stock available △Make-to-order

Spare parts

Inserts	Insert screw	Wrench
		
PNEG11□□□□-GL/GM/GH	I60M4×10	WT15IS

Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Selection of inserts



Good working condition Normal working condition Bad working condition

Workpiece material

- P Steel
- M Stainless steel
- K Cast iron
- N Non-ferrous metal
- S Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	ØI.C	S	ød	r	a_{pmax}	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**PNEG110512-GL**	7.5	15.875	5.56	4.64	1.2	5.5				●						●	★											
	**PNEG110530-GM**	7.5	15.875	5.56	4.64	3.0	5.5				●						●	★											
	**PNEG110530-GH**	7.5	15.875	5.56	4.64	3.0	5.5				●						●	★											

●Inserts are suitable for both left and right cuts ★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

ISO	Workpiece material	Hardness HB	Insert grade	Cutting parameters						a_{pmax}
				-GL		-GM		-GH		
				V_c(m/min)	f_z(mm/z)	V_c(m/min)	f_z(mm/z)	V_c(m/min)	f_z(mm/z)	
P	Low-carbon steel	≤HB180	YB9320 YBG205 YBM253	170(100~250)	0.25(0.1~0.4)	170(100~250)	0.3(0.15~0.5)	160(100~230)	0.4(0.2~0.6)	5.5mm
	High-carbon steel	180~280	YB9320 YBG205 YBM253	160(100~230)	0.8(0.1~0.4)	160(100~230)	0.3(0.15~0.5)	160(100~230)	0.4(0.2~0.6)	
	Alloy steel	180~280	YB9320 YBG205 YBM253	150(100~220)	0.2(0.1~0.3)	150(100~220)	0.25(0.15~0.4)	150(100~220)	0.35(0.2~0.5)	
	Tool steel	280~350	YB9320 YBG205 YBM253	150(100~220)	0.2(0.1~0.3)	150(100~220)	0.3(0.15~0.5)	150(100~220)	0.35(0.2~0.5)	
M	Stainless steel	≤270	YB9320 YBG205 YBM253	130(90~180)	0.25(0.1~0.4)	130(90-180)	0.2(0.1~0.3)	130(90~180)	0.4(0.2~0.6)	
K	Cast iron、Ductile iron、High nickel cast iron	180~250	YB9320 YBG205	180(100~260)	0.2(0.1~0.3)	160(100-240)	0.25(0.15~0.4)	160(100-240)	0.35(0.2~0.5)	

Case for FMA14

Workpiece material: 42CrMo

Tool: FMA14-125-B40-PN11-08

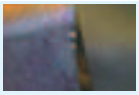
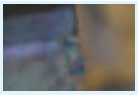
Insert: PNEG110530-GM/YB9320

Cutting data: Vc=140m/min，fz=0.4mm/z，ap=2mm，ae=72mm

Machine: 3-axis machining center

Cooling system: Dry cutting

Comparison of insert abrasion

	PNEG110530-GM	similar product of company A
Time	135min	65min
Abrasion on clearance face		
Abrasion on rake face		

Result:Our FMA14 not only has obvious better tool life than the similar product from Company A, but also have better performance on anti-breakage and wear-resistance.

Face milling tools

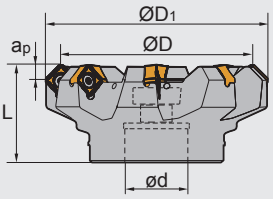
Kr:45°


Face milling

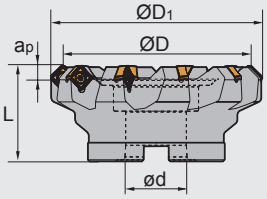

Chamfering

FMA17 P M K S

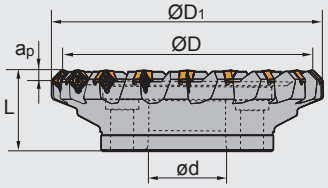
A-type coupling



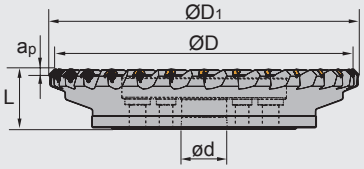
B-type coupling



C-type coupling



D-type coupling



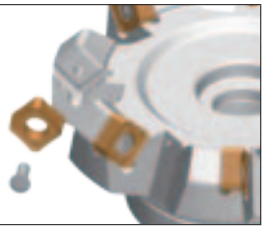
Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Style of coupling	Weight (kg)
			ØD	ØD1	ød	L	apmax			
FMA17 Coarse pitch	**-050-A22-SN12-04C**	▲	50	65	22	40	6.5	4	A	0.384
	-063-A22-SN12-06C	▲	63	78	22	40	6.5	6	A	0.717
	-080-A27-SN12-07C	▲	80	95	27	50	6.5	7	A	1.085
	-100-A32-SN12-08	▲	100	115	32	50	6.5	8	A	1.558
	-125-B40-SN12-10	▲	125	140	40	63	6.5	10	B	3.012
	-160-C40-SN12-12	▲	160	175	40	63	6.5	12	C	4.358
	-200-C60-SN12-18	▲	200	215	60	63	6.5	18	C	6.337
	-250-C60-SN12-20	▲	250	265	60	63	6.5	20	C	12.360
	-315-D60-SN12-22	▲	315	330	60	80	6.5	22	D	21.224
	-400-D60-SN12-28	▲	400	415	60	80	6.5	28	D	39.535
Close pitch	**-050-A22-SN12-06C**	▲	50	65	22	40	6.5	6	A	0.381
	-063-A22-SN12-08C	▲	63	78	22	40	6.5	8	A	0.717
	-080-A27-SN12-10C	▲	80	95	27	50	6.5	10	A	1.105
	-100-A32-SN12-12C	▲	100	115	32	50	6.5	12	A	1.656
	-125-B40-SN12-16	▲	125	140	40	63	6.5	16	B	3.103
	-160-C40-SN12-20	▲	160	175	40	63	6.5	20	C	4.600
	-200-C60-SN12-24	▲	200	215	60	63	6.5	24	C	6.569

▲Stock available △Make-to-order

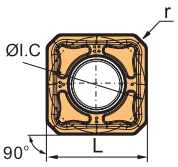
Spare parts

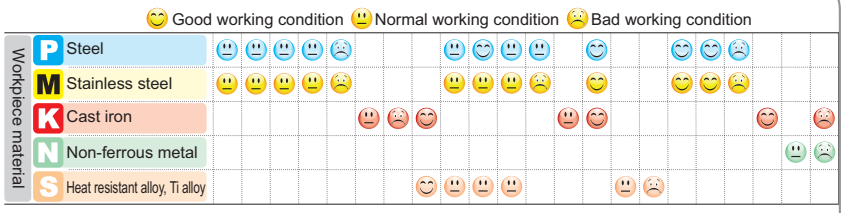
Diameter ØD	Insert screw	Wrench
Ø50-Ø63	IRM4×10	WT15IP
Ø80-Ø160		WT15IS
Ø200-Ø400		WT15IT



Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Selection of inserts





Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	ØI.C	S	ød	r	$a_p$max	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SNGX1205ANN-GL	12.7	12.7	6.5	5.9	0.8	6.5				●		●					★											
	SNMX120512-GL	12.7	12.7	6.5	5.9	1.2	6.5				●		●					★											
	SNGX1205ANN-GM	12.7	12.7	6.5	5.9	0.8	6.5				●		●					★					●					
	SNMX1205ANN-GM	12.7	12.7	6.5	5.9	0.8	6.5				●		●					★					●					
	SNMX120512-GM	12.7	12.7	6.5	5.9	1.2	6.5				●		●					★					●					
	SNGX1205ANN-GH	12.7	12.7	6.5	5.9	0.8	6.5				●		●					★										
	SNMX120512-GH	12.7	12.7	6.5	5.9	1.2	6.5				●		●					★										

●Inserts are suitable for both left and right cuts ★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

ISO	Workpiece material	Hardness HB	Insert grade	Cutting parameters			
				V_c(m/min)	f_z(mm/z)		
					-GL	-GM	-GH
P	Low-carbon steel、Soft steel	⩽ 180	YBM253 YB9320	270(220-350)	0.15(0.1-0.3)	0.2(0.1-0.4)	0.3(0.2-0.5)
	High-carbon steel、Alloy steel	180-280	YBM253 YB9320	260(220-320)	0.15(0.1-0.3)	0.2(0.1-0.4)	0.3(0.2-0.5)
	Alloy tool steel	280-350	YBM253 YB9320	240(180-300)	0.15(0.1-0.3)	0.2(0.1-0.4)	0.3(0.2-0.5)
M	Stainless steel	⩽ 270	YBM253 YB9320	160(110-270)	0.1(0.08-0.2)	0.15(0.1-0.3)	0.2(0.1-0.3)
K	Cast iron、Ductile iron、High nickel cast iron	180-250	YBD152	270(150-300)	0.2(0.1-0.3)	0.3(0.1-0.4)	0.4(0.2-0.5)
S	Difficult-to-machine materials	⩽ 400	YBS303	100(60-120)	--	0.15(0.1-0.25)	--

Case for FMA17

Workpiece: Gear box housing

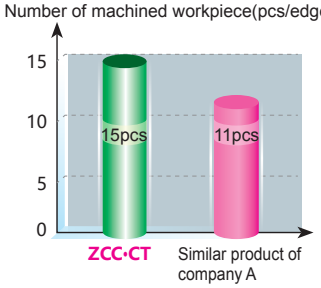
The material of workpiece: HT250(HB220)

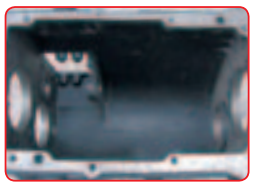
Tool: FMA17-160-C40-SN12-12

Insert: SNGX1205ANN-GM/YBD152

Cutting parameter: Vc=160m/min, fz=0.15mm/z，ap=2mm, ae=100mm

Type of cooling: External cooling

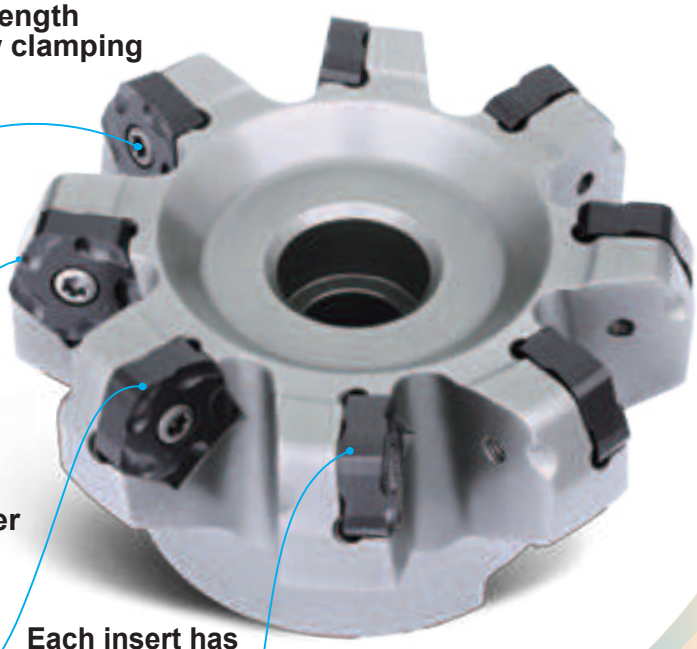




WHIRLWIND FMD02 milling cutter series

The optimized design of the acute angle clamping method has good self-locking performance and high clamping precision which provides enough resisting power to ensure the stability of the machining.

High strength screw clamping



67° approach angle

The open flute and large rake angle design could satisfy the machining requirement of different machine load.

Wiper

The inserts with wiper design which helps to achieve the stable surface quality under different feed rate.

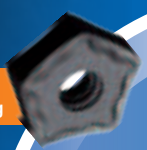
Each insert has 10 cutting edges

The good economical effect and abundant chipbreaker selections could satisfy multiple working conditions.

General face milling for steel and cast iron.
-CF -CM -CR
⑤×2=10 edges

General face milling for cast iron
-PF -PM -PR
⑤×2=10 edges

New chipbreaker for cast iron
-KH -KM -KL

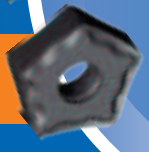


-KH

The optimized cutting edge design emphasis on anti-breakage machining

-KM

general machining chipbreaker. The first choice for cast iron machining



-KL

Emphasizing low cutting force machining to prevent vibration and control burrs to ensure the surface quality.

The helical cutting design with chamfered double-rake angle which can perfectly match different cutting depth requirement.

The high economical inserts with 10 cutting edges could be suitable for both left and right cuts with a high performance-to-cost ratio.

The optimized cutting edge design with high strength of cutting edges and outstanding wear resistance performance greatly increases the tool life.

The low cutting forces design could effectively control the vibration. The combination of the FMD02 could achieve high-performance cast iron machining.

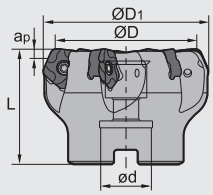
Face milling tools

Kr:67°

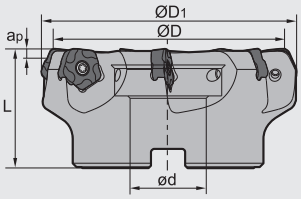
Face milling

FMD02 P K

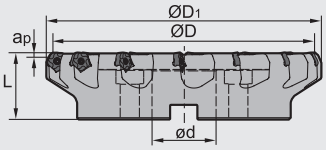
A-type coupling



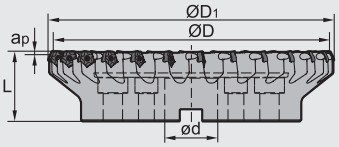
B-type coupling



C-type coupling



D-type coupling



Specification of tools

Type		Stock		Basic dimensions(mm)					Number of teeth Z	Style of coupling	Weight (kg)
		R	L	ØD	ØD1	ød	L	apmax			
FMD02 Coarse pitch (unequal pitch)	**-050-A22-PN11-04**	▲	△	50	60.1	22	50	5/6.5/7.5	4	A	0.6
	-063-A22-PN11-05	▲	△	63	73.1	22	50	5/6.5/7.5	5	A	0.8
	-080-A27-PN11-06	▲	△	80	90.1	27	50	5/6.5/7.5	6	A	1.1
	-100-B32-PN11-07	▲	△	100	110.1	32	50	5/6.5/7.5	7	B	1.8
	-125-B40-PN11-08	▲	△	125	135.1	40	63	5/6.5/7.5	8	B	2.9
	-160-B40-PN11-10	▲	△	160	170.1	40	63	5/6.5/7.5	10	B	5.6
	-200-C60-PN11-12	▲	△	200	210.1	60	63	5/6.5/7.5	12	C	7.9
	-250-C60-PN11-14	▲	△	250	260.1	60	63	5/6.5/7.5	14	C	13.4
Close pitch	**-050-A22-PN11-05**	▲	△	50	60.1	22	50	5/6.5/7.5	5	A	0.6
	-063-A22-PN11-06	▲	△	63	73.1	22	50	5/6.5/7.5	6	A	0.9
	-080-A27-PN11-08	▲	△	80	90.1	27	50	5/6.5/7.5	8	A	1.2
	-100-B32-PN11-10	▲	△	100	110.1	32	50	5/6.5/7.5	10	B	1.9
	-125-B40-PN11-12	▲	△	125	135.1	40	63	5/6.5/7.5	12	B	3.2
	-160-B40-PN11-14	▲	△	160	170.1	40	63	5/6.5/7.5	14	B	6.4
	-200-C60-PN11-16	▲	△	200	210.1	60	63	5/6.5/7.5	16	C	8.5
	-250-C60-PN11-18	▲	△	250	260.1	60	63	5/6.5/7.5	18	C	18.0
	-315-D60-PN11-26	▲	△	315	325.1	60	80	5/6.5/7.5	26	D	24.5

▲Stock available △Make-to-order

Spare parts

Diameter ØD	Insert screw	Wrench
		
Ø50 -Ø315	I60M4×10	WT15IS

Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

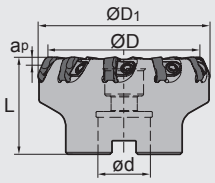
Face milling tools

Kr:67°

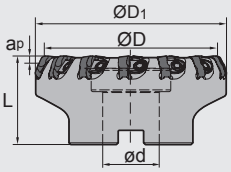
Face milling

FMD02 P K

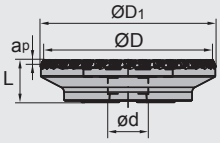
A-type coupling



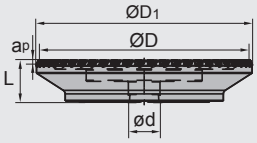
B-type coupling



C-type coupling



D-type coupling



Specification of tools

Type		Stock		Basic dimensions(mm)					Number of teeth Z	Style of coupling	Weight (kg)
		R	L	ØD	ØD1	ød	L	apmax			
FMD02 Extra close pitch	**-080-A27-PN11-10**	▲	△	80	90.1	27	50	5/6.5/7.5	10	A	1.3
	-100-B32-PN11-14	▲	△	100	110.1	32	50	5/6.5/7.5	14	B	1.6
	-125-B40-PN11-18	▲	△	125	135.1	40	63	5/6.5/7.5	18	B	3.2
	-160-B40-PN11-22	▲	△	160	170.1	40	63	5/6.5/7.5	22	B	5.8
	-200-C60-PN11-28	▲	△	200	210.1	60	63	5/6.5/7.5	28	C	9.7
	-250-C60-PN11-36	▲	△	250	260.1	60	63	5/6.5/7.5	36	C	19.8
	-315-D60-PN11-44	▲	△	315	325.1	60	80	5/6.5/7.5	44	D	32.5

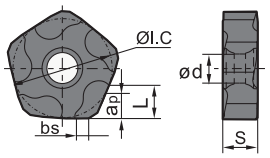
▲Stock available △Make-to-order

Spare parts

Diameter ØD	Wedge	Screw	Wrench
			
Ø80 -Ø125	W18N	DM6×20A	WT15IS
Ø160 -Ø315			WT15IT

Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Selection of inserts



Good working condition Normal working condition Bad working condition

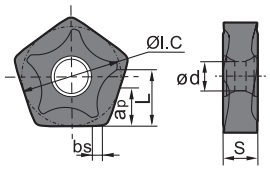
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating									Cermet		Cemented carbide			
		L	ØI.C	S	ød	bs	$a_p$max	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	PNEG110512R-CF	5.4	15.875	5.56	4.64	1.6	5						●																
	PNEG110512L-CF	5.4	15.875	5.56	4.64	1.6	5						●																
	PNEG110512R-CM	5.4	15.875	5.56	4.64	1.6	5						●																
	PNEG110512L-CM	5.4	15.875	5.56	4.64	1.6	5						●																
	PNEG110512R-CR	5.4	15.875	5.56	4.64	1.6	5						●	●															
	PNEG110512L-CR	5.4	15.875	5.56	4.64	1.6	5						●	●															

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Selection of inserts



Good working condition Normal working condition Bad working condition

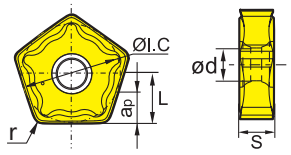
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

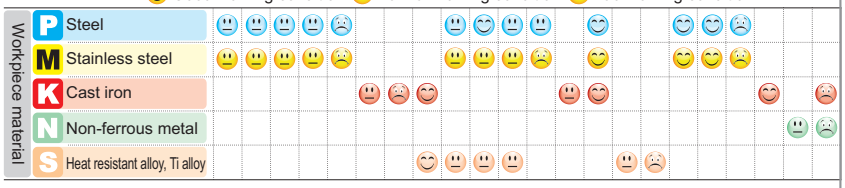
Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating									Cermet		Cemented carbide			
		L	ØI.C	S	ød	bs	$a_p$max	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	PNEG110512R-PF	7.5	15.875	5.56	4.64	1.4	7.5		★		●																		
	PNEG110512L-PF	7.5	15.875	5.56	4.64	1.4	7.5		★		●																		
	PNEG110512R-PM	7.5	15.875	5.56	4.64	1.4	7.5		★		●																		
	PNEG110512L-PM	7.5	15.875	5.56	4.64	1.4	7.5		★		●																		
	PNEG110512R-PR	7.5	15.875	5.56	4.64	1.4	7.5		★		●																		
	PNEG110512L-PR	7.5	15.875	5.56	4.64	1.4	7.5		★		●																		

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Selection of inserts



Good working condition Normal working condition Bad working condition



Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	ØI.C	S	ød	r	a_{pmax}	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**PNEG110512-KL**	6.5	15.875	5.56	4.64	1.2	6.5						●	●															
	**PNEG110512-KM**	6.5	15.875	5.56	4.64	1.2	6.5						●	●															
	**PNEG110512-KH**	6.5	15.875	5.56	4.64	1.2	6.5						●	●															

●Inserts are suitable for both left and right cuts

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters				
				V_c(m/min)	f_z(mm/z)			a_{pmax}(mm)
					-PF	-PM	-PR	
P	Low-carbon steel、Soft steel	⩽180	YBM253 YBC302	270 (220-350)	0.15 (0.1-0.2)	0.2(0.1-0.3)	0.3(0.2-0.4)	7.5
P	High-carbon steel、Alloy steel	180-280	YBM253 YBC302	260 (200-320)	0.15 (0.1-0.2)	0.2(0.1-0.3)	0.3(0.2-0.4)	7.5
P	Alloy tool steel	280-350	YBM253 YBC302	240 (180-300)	0.15 (0.1-0.2)	0.2(0.1-0.3)	0.3(0.2-0.4)	7.5
K	Cast iron	180-250			-CF	-CM	-CR	5.0
K	Cast iron	180-250	YBD152	270 (150-300)	0.15(0.1-0.2)	0.2(0.1-0.3)	0.3(0.2-0.4)	5.0
K	Cast iron	180-250	YBD252	240 (150~280)	0.25(0.2~0.4)	0.3(0.2~0.5)	0.4(0.2~0.6)	5.0
K	Grey cast iron	180~250			-KL	-KM	-KH	6.5
K	Grey cast iron	180~250	YBD152	270 (150~300)	0.25(0.1~0.4)	0.3(0.2~0.5)	0.4(0.2~0.6)	6.5
K	Grey cast iron	180~250	YBD252	240 (150~280)	0.25(0.2~0.4)	0.3(0.2~0.5)	0.4(0.2~0.6)	6.5

Case for FMD02

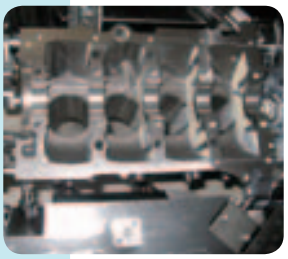
Application case

ZCC-CT

Cutting parameters:
D=100mm, a_p=3~5mm,
Vc=243m/min, f_z=0.15mm/z,
T=145~155 piece

similar product of company A

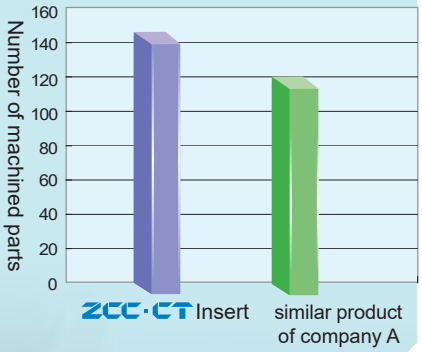
Cutting parameters:
D=100mm, a_p=3~5mm,
Vc=243m/min, f_z=0.12mm/z,
T=120~133 piece



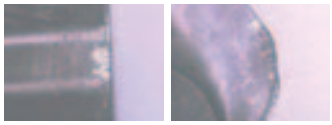
Tool type: FMD02-100-B32-PN11-10

Insert type/grade: PNEG110512R-CR/YBD152

(The inserts without clearance angle to have a total of 10 cutting edges)



● Comparison of insert abrasion

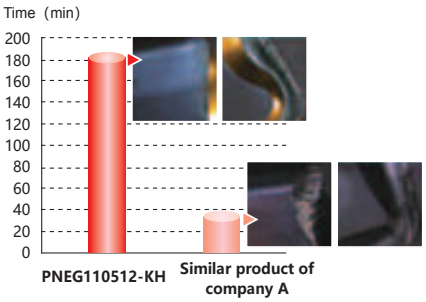


ZCC-CT insert after 80 minutes machining

Insert of company A after 48 minutes machining

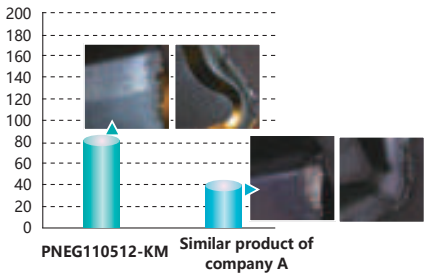
Application case

Workpiece material	Grey cast iron 250	Insert	PNEG110512-KM/YBD152 PNEG110512-KH/YBD252
Tool type	FMD02-125-B40-PN11-08	Cutting method	single pitch dry cut



Abrasion comparision

Cutting parameters: Vc=240m/min, fz=0.3mm/z, Ap=3mm, Ae=70mm



Abrasion comparision

Cutting parameters: Vc=300m/min, fz=0.2mm/z, Ap=2mm, Ae=70mm

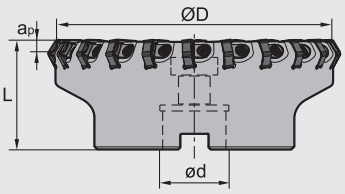
Face milling tools

Kr:55°

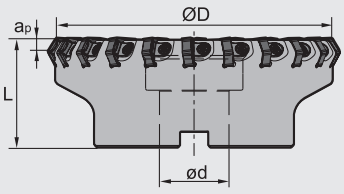
Face milling

FMD02 K

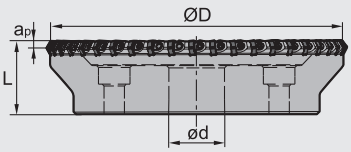
A-type coupling



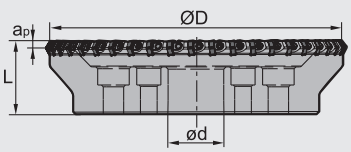
B-type coupling



C-type coupling



D-type coupling



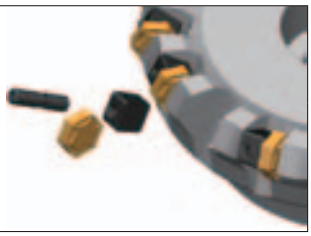
Specification of tools

Type		Stock		Basic dimensions(mm)				Number of teeth Z	Type of coupling	Weight (kg)
		R	L	ØD	d	L	$a_p$max			
FMD02	**-080-A27-HN09-10**	▲	△	80	27	50	6	10	A	1.1
	-100-B32-HN09-14	▲	△	100	32	63	6	14	B	2.6
	-125-B40-HN09-18	▲	△	125	40	70	6	18	B	3.7
	-160-B40-HN09-22	▲	△	160	40	63	6	22	B	5.6
	-200-C60-HN09-28	▲	△	200	60	63	6	28	C	6.3
	-250-C60-HN09-36	▲	△	250	60	63	6	36	C	10.3
	-315-D60-HN09-44	▲	△	315	60	63	6	44	D	21.7

▲Stock available △Make-to-order

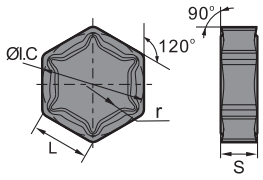
Spare parts

Diameter ØD	Wedge	Wedge screw	Wrench
			
Ø80-Ø315	W18N	DM6×20A	WT15IT



Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Selection of inserts



Good working condition Normal working condition Bad working condition

Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)				CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	ØI.C	S	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**HNEX090512-DF**	9.16	15.875	5.56	1.2						★																
	**HNEX090512-DM**	9.16	15.875	5.56	1.2						★																
	**HNEX090512-DR**	9.16	15.875	5.56	1.2						○ ★																

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Chipbreaker selection for FMD02 milling inserts

Classification \ Function	For finishing	For semi-finishing	For roughing
K	-DF	-DM	-DR

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters			
				V_c(m/min)	f_z(mm/z)		
					-DF	-DM	-DR
K	Cast iron	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)

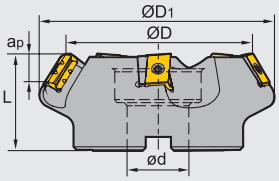
Face milling tools

Kr:60°

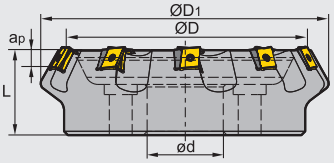
Face milling

FMD03 P M K

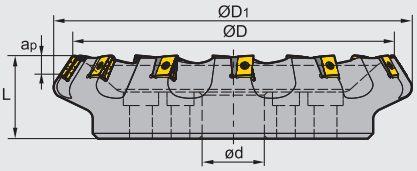
B-type coupling



C-type coupling



D-type coupling



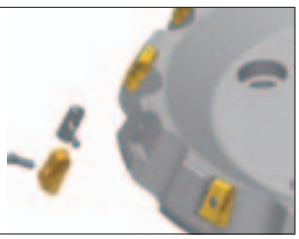
Specification of tools

Type		Stock		Basic dimensions(mm)					Number of teeth Z	Style of coupling	Weight (kg)
		R	L	ØD	ØD1	ød	L	apmax			
FMD03	-125-B40-LN20-06	▲	△	125	153	40	63	12	6	B	4.5
	-160-C40-LN20-08	▲	△	160	187	40	63	12	8	C	6.9
	-200-C60-LN20-10	▲	△	200	227	60	70	12	10	C	10.5
	-250-C60-LN20-12	▲	△	250	276	60	70	12	12	C	13.4
	-315-D60-LN20-15	▲	△	315	339	60	80	12	15	D	26.2
	-125-B40-LN25-05	▲	△	125	154	40	63	17	5	B	4.5
	-160-C40-LN25-06	▲	△	160	189	40	63	17	6	C	6.9
	-200-C60-LN25-08	▲	△	200	229	60	70	17	8	C	10.5
	-250-C60-LN25-10	▲	△	250	278	60	70	17	10	C	16.7
	-315-D60-LN25-12	▲	△	315	346	60	80	17	12	D	27.3
	-400-D60-LN25-16	▲	△	400	427	60	80	17	16	D	47.1

▲Stock available △Make-to-order

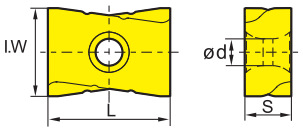
Spare parts

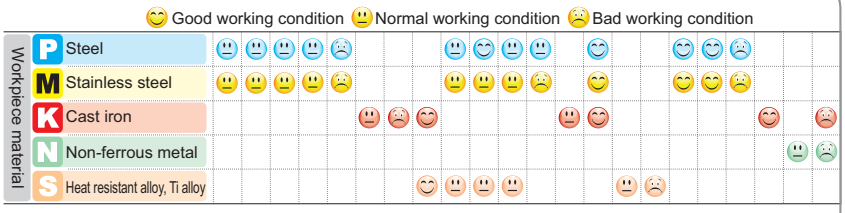
Inserts	Shim	Shim screw	Insert screw	Wrench	
LNKT2007DN-ZR	LLN20R-ZR	I60M3×7	I60M4×15	WT15IS	WT10IS
LNKT2510-ZR	LLN25R-ZR	I60M3.5×10.4	I60M5×17	WT20IT	WT15IS



Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Selection of inserts





Insert shape	Type	Basic dimensions(mm)				CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	I.W	S	ød	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**LNKT2007DN-ZR**	20	17	7.94	4.6					○	○						★										
	**LNKT2510-ZR**	25	18	9.525	5.5					○		○					★										

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

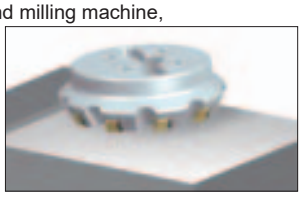
Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				V_c(m/min)	f_z(mm/z)
P	Low-carbon steel、Soft steel	≤180	YBG302	180 (150-300)	0.5 (0.2-0.8)
			YBM351	180 (150-300)	0.5 (0.2-0.8)
	High-carbon steel、Alloy steel	180-280	YBG302	150 (120-280)	0.5 (0.2-0.8)
			YBM351	140 (120-280)	0.5 (0.2-0.8)
	Alloy tool steel	280-350	YBG302	120 (80-250)	0.45 (0.2-0.6)
			YBM351	100 (80-250)	0.45 (0.2-0.6)
M	Stainless steel	≤270	YBG302	120 (80-200)	0.45 (0.2-0.6)
			YBM351	100 (80-200)	0.45 (0.2-0.6)
K	Cast iron	180-250	YBD152	220 (150-300)	0.5 (0.2-0.8)
			YBD252	210 (150-300)	0.5 (0.2-0.8)
			YBG302	200 (150-300)	0.5 (0.2-0.8)

Note: Cutting parameters can be adjusted according to the Max. power of machine.

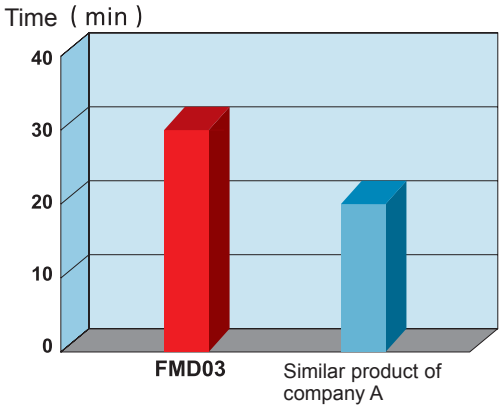
Case for FMD03

Workpiece material：ASTM A743 CA-6NM(HB200)
Cooling system: Dry cutting
Machine: NC floor type boring and milling machine,
spindle power≥30KW
Cutting parameters：
Vc=120m/min
a_p=12mm
f_z=0.55mm/z
a_e=230mm



Tool type：FMD03-315-D60-LN25-12
Insert type/grade：LNKT2510-ZR/YBG302

●Comparison of machining time



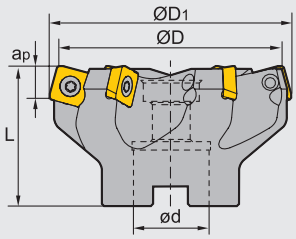
Face milling tools

Kr:75°

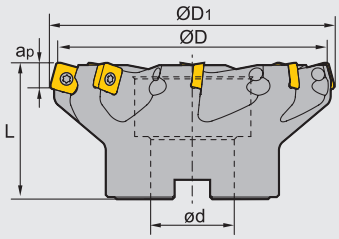
Face milling

FME02 P M K

A-type coupling



B-type coupling



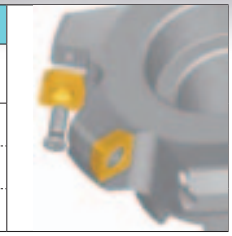
Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
			ØD	ØD1	ød	L	apmax			
FME02	-050-A22-SP12-04	△	50	54	22	40	6	4	A	0.3
	-063-A22-SP12-05	△	63	66	22	50	6	5	A	0.6
	-080-A27-SP12-06	△	80	83	27	50	6	6	A	0.9
	-100-B32-SP12-07	△	100	103	32	50	6	7	B	1.4
	-125-B40-SP12-08	△	125	128	40	63	6	8	B	2.5

▲Stock available △Make-to-order

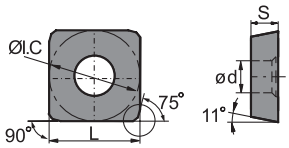
Spare parts

Diameter ØD	Insert screw	Wrench
		
Ø50-Ø125	I60M5×13.2	WT20IS



Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Selection of inserts



Good working condition Normal working condition Bad working condition

Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)				CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	ØI.C	S	ød	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**SPKW1204EDFR**	12.7	12.7	4.76	5.56									○													
	SPKW1204EDSR	12.7	12.7	4.76	5.56									○													
	**SPKT1204EDR**	12.7	12.7	4.76	5.56									★													

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Cutting edge treatment selection for FME02 milling inserts

Classification \ Function	For finishing	For semi-finishing	For roughing
P	EDFR	EDR	EDSR
M	EDFR	EDR	
K	EDFR	EDR	

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				V_c(m/min)	f_z(mm/z)
P	Low-carbon steel、Soft steel	⩽180	YBG202	270(200-360)	0.2 (0.1-0.3)
P	High-carbon steel、Alloy steel	180-280	YBG202	240 (180-350)	0.2 (0.1-0.3)
P	Alloy tool steel	280-350	YBG202	220 (170-340)	0.2 (0.1-0.3)
M	Stainless steel	⩽270	YBG202	160 (110-270)	0.2 (0.1-0.3)
K	Cast iron	180-250	YBG202	160 (120-200)	0.2 (0.1-0.3)

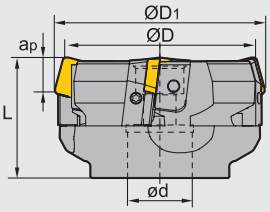
Face milling tools

Kr:75°

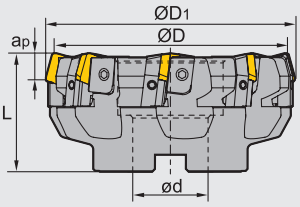
Face milling

FME03 P M K

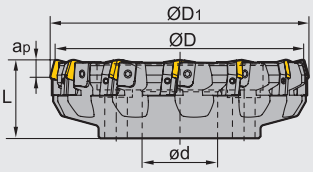
A-type coupling



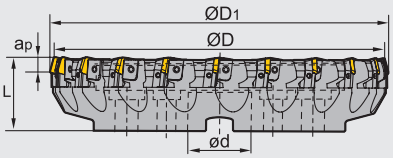
B-type coupling



C-type coupling



D-type coupling

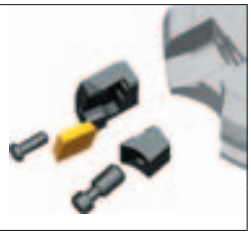


Specification of tools

Type		Stock		Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
		R	L	ØD	ØD1	ød	L	$a_p$max			
FME03	**-080-A27-SP12-04**	▲	△	80	84	27	50	6	4	A	1.1
	-100-B32-SP12-06	▲	△	100	104	32	50	6	6	B	1.9
	-125-B40-SP12-08	▲	△	125	129	40	63	6	8	B	3.5
	-160-B40-SP12-10	▲	△	160	164	40	63	6	10	B	5.7
	-200-C60-SP12-12	▲	△	200	203	60	63	6	12	C	8.2
	-250-C60-SP12-16	▲	△	250	253	60	63	6	16	C	13.8
	-315-D60-SP12-20	▲	△	315	318	60	70	6	20	D	23.5
	-080-A27-SP15-04	▲	△	80	84	27	50	8	4	A	1.0
	-100-B27-SP15-06	▲	△	100	104	27	50	8	6	B	1.8
	-125-B40-SP15-08	▲	▲	125	129	40	63	8	8	B	3.3
	-160-B40-SP15-10	▲	▲	160	164	40	63	8	10	B	5.4
	-200-C60-SP15-12	▲	▲	200	204	60	63	8	12	C	7.9
	-250-C60-SP15-16	▲	▲	250	253	60	63	8	16	C	13.6
	-315-D60-SP15-20	▲	▲	315	318	60	70	8	20	D	23.1

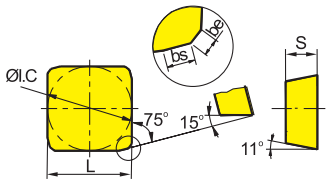
▲Stock available △Make-to-order

Spare parts

Diameter ØD	Inserts	Locator	Wedge	Wedge Screw	Locator screw	Wrench	
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			

Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Selection of inserts



Good working condition Normal working condition Bad working condition

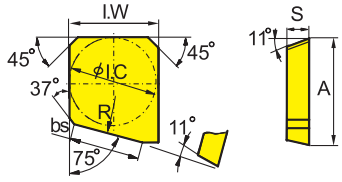
Workpiece material		
P	Steel	😃 😃 😃 😃 ☹ 😃 😃 😊 😃 😃 😊 😊 😊 ☹
M	Stainless steel	😃 😃 😃 😃 ☹ 😃 😃 😃 ☹ 😊 😊 😊 ☹
K	Cast iron	😃 ☹ 😊 😃 😊 ☹ 😊
N	Non-ferrous metal	😃 ☹
S	Heat resistant alloy, Ti alloy	😊 😃 😃 😃 😃 ☹ ☹

Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating									Cermet		Cemented carbide			
		L	ØI.C	S	be	bs	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	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	12.7	12.7	3.18	1	1.4								★	○													●
	SPKN1203EDFL	12.7	12.7	3.18	1	1.4								○	○													○
	SPKN1203EDSKR	12.7	12.7	3.18	1	1.4												○							○			
	SPKN1203EDSKL	12.7	12.7	3.18	1	1.4												○							○			
	SPKN1203EDTKR	12.7	12.7	3.18	1	1.4	●				●				○			★							●			○
	SPKN1203EDTKL	12.7	12.7	3.18	1	1.4									○			○							○			○
	SPKN1203EDS31R	12.7	12.7	3.18	1	1.4												○							○			
	SPKN1203EDS31L	12.7	12.7	3.18	1	1.4												○							○			
	SPKN1203EDT31R	12.7	12.7	3.18	1	1.4	●				●				○			★							●			○
	SPKN1203EDT31L	12.7	12.7	3.18	1	1.4									○			○							○			○
	SPKR1203EDR-GM	12.7	12.7	3.18	1	1.4			●						★			★							●			●
	SPKR1203EDL-GM	12.7	12.7	3.18	1	1.4			●						★			★							●			●
	SPKN1504EDER	15.875	15.875	4.76	1	1.4									○													
	SPKN1504EDEL	15.875	15.875	4.76	1	1.4									○													
	SPKN1504EDFR	15.875	15.875	4.76	1	1.4								○	○													○
	SPKN1504EDFL	15.875	15.875	4.76	1	1.4								○	○													○
	SPKN1504EDSKR	15.875	15.875	4.76	1	1.4												○							○			
	SPKN1504EDSKL	15.875	15.875	4.76	1	1.4												○							○			
	SPKN1504EDTKR	15.875	15.875	4.76	1	1.4	●								★			○							●			●
	SPKN1504EDTKL	15.875	15.875	4.76	1	1.4									○			○							○			●
	SPKN1504EDS32R	15.875	15.875	4.76	1	1.4												○							○			
	SPKN1504EDS32L	15.875	15.875	4.76	1	1.4												○							○			
	SPKN1504EDT32R	15.875	15.875	4.76	1	1.4	●								★			○							●			●
	SPKN1504EDT32L	15.875	15.875	4.76	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			●						★			★							●			●

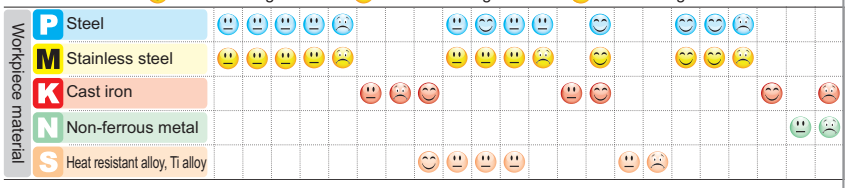
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Ordering guide: **SPKN1203EDT3 1 R** chamfering angle 20°, chamfering width 0.15mm. For other edge shapes, see inserts code key standard.

Selection of inserts



Good working condition Normal working condition Bad working condition



Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating								Cermet		Cemented carbide			
		A	ØI.C	I.W	S	bs	R	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
inserts with wiper 	**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																				○		●

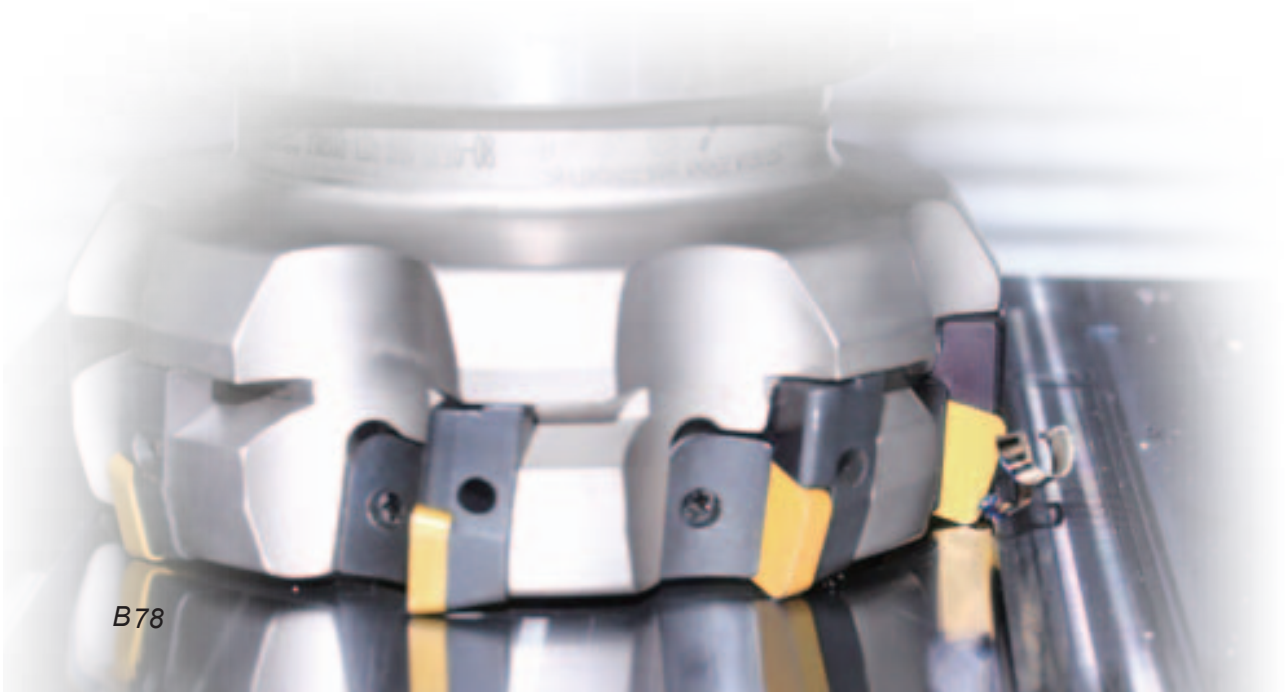
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Cutting edge treatment selection for FME03 milling inserts

Treatment of cutting edge	Recommended selection
SP□□EDER/L	Honing edge is suitable for semi-finish and finish machining of steel and stainless steel.
SP□□EDFR/L	Sharp cutting edge is suitable for finish machining of cast iron materials.
SP□□EDSKR/L **SP□□EDS□□R/L**	After chamfering and honing, the edge has strong anti-breakage capability, suitable for rough machining of steel parts under poor working conditions.
SP□□EDTKR/L **SP□□EDT□□R/L**	The Chamfered edge is suitable for semi-finishing and finishing machining of steel, stainless steel and cast iron materials.
SP□□EDR/L-GM	3D chipbreaker can reduce cutting force, reinforce the capability of chip control, and improve insert life. It is widely applied in semi-finish machining of steel, stainless steel and cast iron materials.

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				V_c(m/min)	f_z(mm/z)
P	Low-carbon steel、Soft steel	≤180	YBG202	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	180-280	YBG202	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	280-350	YBG202	220 (170-340)	0.2 (0.1-0.3)
			YBG302	190 (130-300)	0.24 (0.1-0.3)
			YBM251 YBC301	220 (180-300)	0.2 (0.1-0.4)
			YBM351	180 (150-250)	0.25 (0.15-0.3)
			YC30S	100 (60-180)	0.22 (0.1-0.3)
M	Stainless steel	≤270	YBG202	160 (110-270)	0.2 (0.1-0.3)
			YBG302	140 (100-250)	0.24 (0.1-0.3)
			YBM251	150 (120-240)	0.2 (0.1-0.4)
			YBM351	140 (100-240)	0.25 (0.15-0.3)
K	Cast iron	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)



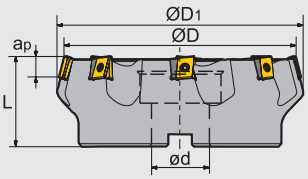
Face milling tools

Kr:75°

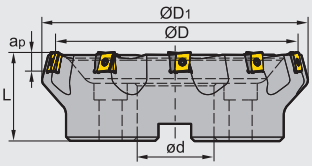
Face milling

FME04 P M K

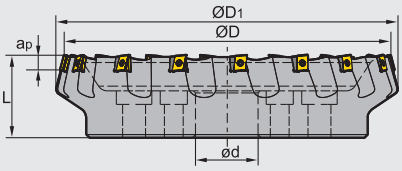
B-type coupling



C-type coupling



D-type coupling

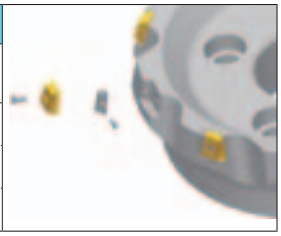


Specification of tools

Type		Stock		Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
		R	L	ØD	ØD1	ød	L	apmax			
FME04	-125-B40-LN15-06	▲	△	125	137	40	63	12	6	B	3.8
	-160-B40-LN15-08	▲	△	160	170	40	63	12	8	B	6.6
	-200-C60-LN15-10	▲	△	200	208	60	70	12	10	C	9.6
	-250-C60-LN15-12	▲	△	250	257	60	70	12	12	C	13.4
	-315-D60-LN15-16	▲	△	315	328	60	80	12	16	D	25.2

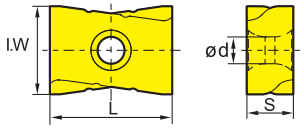
▲Stock available △Make-to-order

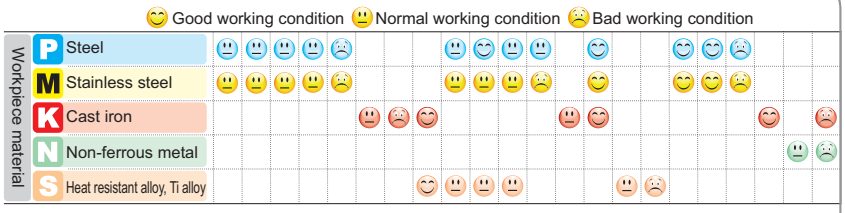
Spare parts

Diameter ØD	Shim	Shim screw	Insert screw	Wrench	
					
Ø125-Ø315	LLN15-ZR	I60M3×7	I60M4×12	WT15IS, WT09IS	

Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Selection of inserts





Insert shape	Type	Basic dimensions(mm)				CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	I.W	S	ød	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**LNKT1506EN-ZR**	15.875	14	6.35	4.6					○	○						★										

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				V_c(m/min)	f_z(mm/z)
P	Low-carbon steel、Soft steel	≤180	YBG302	180 (150-300)	0.5 (0.2-0.8)
			YBM351	180 (150-300)	0.5 (0.2-0.8)
	High-carbon steel、Alloy steel	180-280	YBG302	150 (120-280)	0.5 (0.2-0.8)
			YBM351	140 (120-280)	0.5 (0.2-0.8)
	Alloy tool steel	280-350	YBG302	120 (80-250)	0.45 (0.2-0.6)
			YBM351	100 (80-250)	0.45 (0.2-0.6)
M	Stainless steel	≤270	YBG302	120 (80-200)	0.45 (0.2-0.6)
			YBM351	100 (80-200)	0.45 (0.2-0.6)
K	Cast iron	180-250	YBD152	220 (150-300)	0.5 (0.2-0.8)
			YBG302	200 (150-300)	0.5 (0.2-0.8)

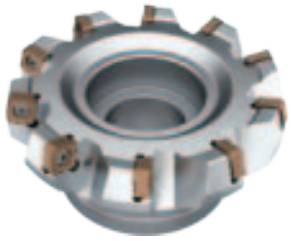
Note: Cutting parameters can be adjusted according to the Max. power of machine.

Face milling tools

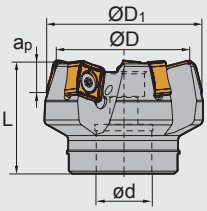
Kr:75°

Face milling

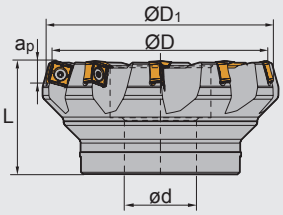
FME17 P M K S



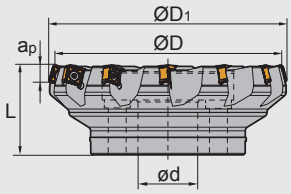
A-type coupling



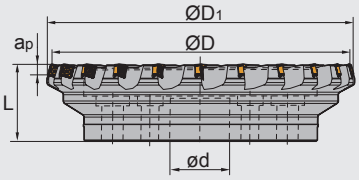
B-type coupling



C-type coupling



D-type coupling



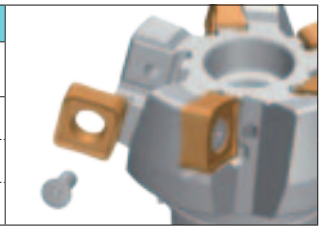
Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
			ØD	ØD1	ød	L	apmax			
FME17 Coarse pitch	**-050-A22-SN12-04C**	▲	50	60	22	40	8.0	4	A	0.361
	-063-A22-SN12-05C	▲	63	73	22	40	8.0	5	A	0.520
	-080-A27-SN12-06C	▲	80	90	27	50	8.0	6	A	1.101
	-100-A32-SN12-08C	▲	100	110	32	50	8.0	8	A	1.663
	-125-B40-SN12-10	▲	125	135	40	63	8.0	10	B	3.099
	-160-C40-SN12-12	▲	160	170	40	63	8.0	12	C	4.535
	-200-C60-SN12-14	▲	200	210	60	63	8.0	14	C	6.450
	-250-C60-SN12-18	▲	250	260	60	63	8.0	18	C	12.980
	-315-D60-SN12-22	▲	315	325	60	80	8.0	22	D	21.932
	-400-D60-SN12-28	▲	400	410	60	80	8.0	28	D	41.555
Close pitch	**-050-A22-SN12-05C**	▲	50	60	22	40	8.0	5	A	0.337
	-063-A22-SN12-07C	▲	63	73	22	40	8.0	7	A	0.530
	-080-A27-SN12-09C	▲	80	90	27	50	8.0	9	A	1.112
	-100-A32-SN12-11C	▲	100	110	32	50	8.0	11	A	1.577
	-125-B40-SN12-14	▲	125	135	40	63	8.0	14	B	3.145
	-160-C40-SN12-18	▲	160	170	40	63	8.0	18	C	4.647
	-200-C60-SN12-22	▲	200	210	60	63	8.0	22	C	6.552

▲Stock available △Make-to-order

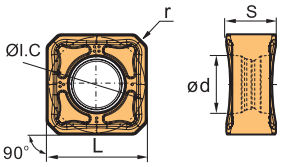
Spare parts

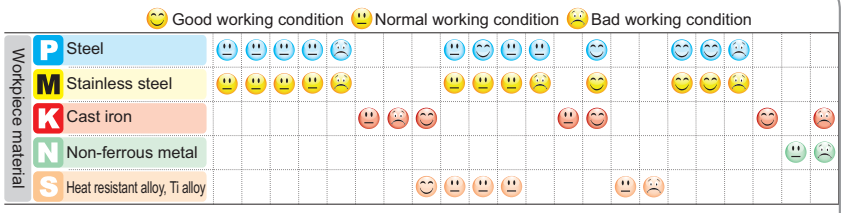
Diameter ØD	Insert screw	Wrench
Ø50-Ø63	IRM4×10	WT15IP
Ø80 ~ Ø125		WT15IS
Ø160 ~ Ø400		WT15IT



Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Selection of inserts





Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	ØI.C	S	ød	r	$a_p$max	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**SNGX1205ENN-GL**	12.7	12.7	6.5	5.9	0.8	8.0				●		●					★											
	SNMX120512-GL	12.7	12.7	6.5	5.9	1.2	8.0				●		●					★											
	**SNGX1205ENN-GM**	12.7	12.7	6.5	5.9	0.8	8.0				●		●					★					●						
	SNMX120512-GM	12.7	12.7	6.5	5.9	1.2	8.0				●		●					★					●						
	**SNGX1205ENN-GH**	12.7	12.7	6.5	5.9	0.8	8.0				●		●					★											
	SNMX120512-GH	12.7	12.7	6.5	5.9	1.2	8.0				●		●					★											

●Inserts are suitable for both left and right cuts ★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

ISO	Workpiece material	Hardness HB	Insert grade	Cutting parameters			
				V_c (m/min)	f_z(mm/z)		
					-GL	-GM	-GH
P	Low-carbon steel、Soft steel	⩽ 180	YBM253 YB9320	270(220-350)	0.15(0.1-0.3)	0.2(0.1-0.4)	0.3(0.2-0.5)
	High-carbon steel、Alloy steel	180-280	YBM253 YB9320	260(220-320)	0.15(0.1-0.3)	0.2(0.1-0.4)	0.3(0.2-0.5)
	Alloy tool steel	280-350	YBM253 YB9320	240(180-300)	0.15(0.1-0.3)	0.2(0.1-0.4)	0.3(0.2-0.5)
M	Stainless steel	⩽ 270	YBM253 YB9320	160(110-270)	0.1(0.08-0.2)	0.15(0.1-0.3)	0.2(0.1-0.3)
K	Cast iron、Ductile iron、High nickel cast iron	180-250	YBD152	270(150-300)	0.2(0.1-0.3)	0.3(0.1-0.4)	0.4(0.2-0.5)
S	Difficult-to-machine materials	⩽ 400	YBS303	100(60-120)	--	0.15(0.1-0.25)	--

Case for FME17

Workpiece：Transmission

The material of workpiece: 40cr(HRC25-40)

Processing part：Upper face

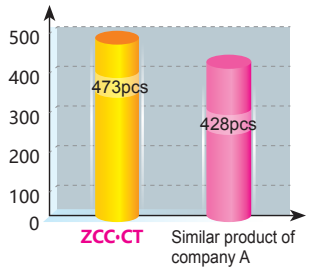
Tool: FME17-125-B40-SN12-10

Insert: SNGX1205ENN-GM/YB9320

Cutting parameter: Vc=255m/min,fz=0.08mm/z，ap=5mm,ae=75mm

Type of cooling:External cooling

Number of machined workpiece(pcs/edge)



Face milling tools

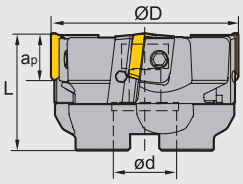
Kr:90°


Face milling

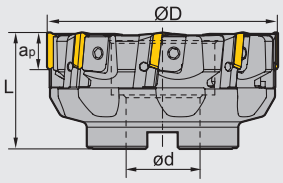

Step shoulder

FMP01 P M K

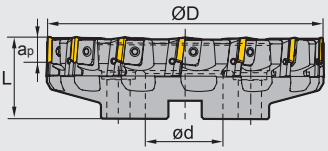
A-type coupling



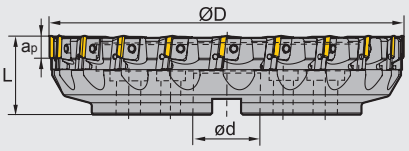
B-type coupling



C-type coupling



D-type coupling

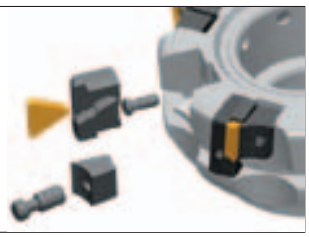


Specification of tools

Type		Stock		Basic dimensions(mm)				Number of teeth Z	Type of coupling	Weight (kg)
		R	L	ØD	ød	L	$a_p$max			
FMP01	**-080-A27-TP22-04**	▲	△	80	27	50	18	4	A	1.2
	-100-B32-TP22-06	▲	△	100	32	50	18	6	B	1.7
	-125-B40-TP22-08	▲	△	125	40	63	18	8	B	3.2
	-160-B40-TP22-10	▲	△	160	40	63	18	10	B	5.1
	-200-C60-TP22-12	▲	△	200	60	63	18	12	C	7.4
	-250-C60-TP22-16	▲	△	250	60	63	18	16	C	12.3
	-315-D60-TP22-20	▲	△	315	60	70	18	20	D	21.9

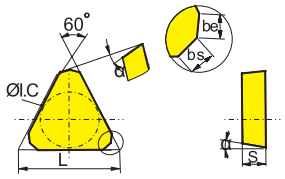
▲Stock available △Make-to-order

Spare parts

Diameter ØD	Locator	Wedge	Wedge Screw	Locator screw	Wrench	
Ø80 Ø100	LTP4R1/L1	W04R/L	WM8×17	LOM5×15.1	WT20T WT25T	
Ø125 ~ Ø315	LTP4R/L		WM8×22			

Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Selection of inserts



Good working condition Normal working condition Bad working condition

Workpiece material	
P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating							Cermet		Cemented carbide			
		L	ØI.C	S	be	bs	α	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	TPKN2204PDFR	22	12.7	4.76	1.4	0.7	11°								○														○
	TPKN2204PDFL	22	12.7	4.76	1.4	0.7	11°								○														○
	TPKN2204PDR	22	12.7	4.76	1.4	0.7	11°	●				●			★	★			★							●			●
	TPKN2204PDL	22	12.7	4.76	1.4	0.7	11°																			●			
	TPKN2204PDTR	22	12.7	4.76	1.4	0.7	11°	●																		●			
	TPKN2204PDTL	22	12.7	4.76	1.4	0.7	11°	○																		○			

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				V_c(m/min)	f_z(mm/z)
P	Low-carbon steel、Soft steel	⩽180	YBC301	270 (220-350)	0.2 (0.1-0.4)
			YBM351	220 (180-300)	0.2 (0.08-0.3)
			YBG202	270 (200-360)	0.2 (0.1-0.3)
			YC30S	140 (100-220)	0.22 (0.1-0.3)
	High-carbon steel、Alloy steel	180—280	YBC301	240 (200-320)	0.2 (0.1-0.4)
			YBM351	200 (160-280)	0.2 (0.08-0.3)
			YBG202	240 (180-350)	0.2 (0.1-0.3)
			YC30S	120 (80-200)	0.22 (0.1-0.3)
	Alloy tool steel	280—350	YBC301	220 (180-300)	0.2 (0.1-0.4)
			YBM351	180 (150-250)	0.2 (0.08-0.3)
			YBG202	220 (170-340)	0.2 (0.1-0.3)
			YC30S	100 (60-180)	0.22 (0.1-0.3)
M	Stainless steel	⩽270	YBM351	140 (100-240)	0.2 (0.08-0.3)
			YBG202	140 (100-250)	0.2 (0.1-0.3)
K	Cast iron	180—250	YBG102	210 (120-300)	0.2 (0.1-0.3)
			YBG302	160 (120-200)	0.35 (0.10-0.4)
			YD201	100 (80-160)	0.24 (0.15-0.4)

Face milling tools

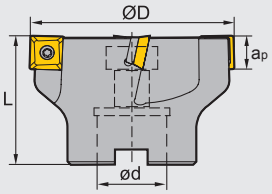
Kr:90°


Face milling

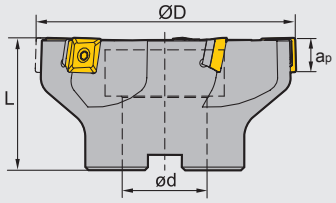

Step shoulder

FMP02 P M K S

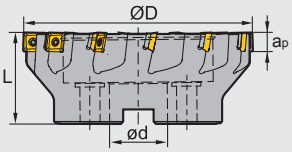
A-type coupling



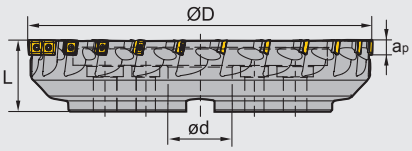
B-type coupling



C-type coupling



D-type coupling



Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth Z	Type of coupling	Weight (kg)
			ØD	ød	L	$a_p$max			
FMP02	**-040-A16-SE09-04**	△	40	16	40	6.7	4	A	0.2
	-040-A16-SE09-06	△	40	16	40	6.7	6	A	0.22
	-050-A22-SE09-05	▲	50	22	40	6.7	5	A	0.3
	-050-A22-SE09-07	△	50	22	40	6.7	7	A	0.313
	-063-A22-SE09-06	▲	63	22	40	6.7	6	A	0.5
	-063-A22-SE09-08	△	63	22	40	6.7	8	A	0.479
	-080-A27-SE09-08	▲	80	27	50	6.7	8	A	0.9
	-080-A27-SE09-10	△	80	27	50	6.7	10	A	1.079
	-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

▲Stock available △Make-to-order

Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth Z	Type of coupling	Weight (kg)
			ØD	ød	L	apmax			
FMP02	**-050-A22-SE12-03**	▲	50	22	40	10.8	3	A	0.3
	-063-A22-SE12-04	▲	63	22	40	10.8	4	A	0.4
	-080-A27-SE12-04	▲	80	27	50	10.8	4	A	0.9
	-100-B32-SE12-05	▲	100	32	50	10.8	5	B	1.2
	-125-B40-SE12-06	▲	125	40	63	10.8	6	B	3.1
	-160-C40-SE12-08	▲	160	40	63	10.8	8	C	4.1
	-200-C60-SE12-10	△	200	60	63	10.8	10	C	5.718
	-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
	-160-C40-SE12-15	△	160	40	63	10.8	15	C	4.061
	-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

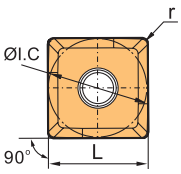
▲Stock available △Make-to-order

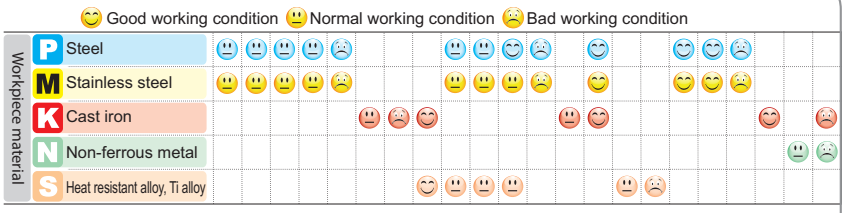
Spare parts

Diameter ØD	Inserts	Shim	Insert screw	Shim screw	Wrench	Wrench
						
Ø50 ~ Ø125	SE09	--	I60M3×7	--	WT09IS	--
Ø50	SE12	--	I60M3.5×10	--	WT15IS	--
Ø63 ~ Ø315		S12BSX	I60M3.5×12	SM5×7×A		WH35L

Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Selection of inserts

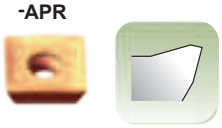




Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	ØI.C	S	ød	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**SEET09T308PER-APF**	9.525	9.525	4.01	3.3	0.8					●	★			●		★					●						
	SEET120308PER-APF	13.308	13.308	4.04	4.1	0.8					●	★			●		★					●						
	**SEET09T308PER-APM**	9.525	9.525	4.01	3.3	0.8					●	★			●		★					●						
	SEET120308PER-APM	13.308	13.308	4.04	4.1	0.8					●	★			●		★					●						
	**SEET09T308PER-APR**	9.525	9.525	4.01	3.3	0.8					●	★			●		★											
	SEET120308PER-APR	13.308	13.308	4.04	4.1	0.8					●	★			●		★											

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Chipbreaker selection for FMP02 milling inserts

Classification \ Function	For finishing	For semi-finishing	For roughing
P	-APF 	-APM 	-APR 
M			
K			
S			--

Features of FMP02 Series Milling Tools

- Inserts designed with new geometries and coated grades for optimized high efficiency machining in different working conditions.
- Unique geometric design resulting in true 90° square shoulder cutting.

- Upgraded insert structure, greatly improves tool life.
- Large positive rake angle resulting in easier cutting with less tool pressure.

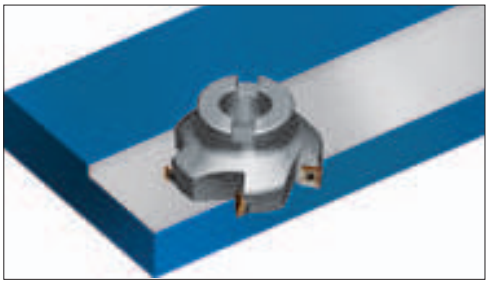
- Screw down clamping resulting in better chip evacuation.

Recommended cutting parameters

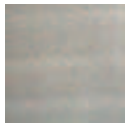
Workpiece material		Hardness HB	Insert grade	Cutting parameters			
				Vc(m/min)	fz(mm/z)		
					-APF	-APM	-APR
P	Low-carbon steel、Soft steel	≤180	YBG202	270(200-360)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
			YB9320	270(200-360)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
	High-carbon steel、Alloy steel	180-280	YBM351	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)
			YB9320	240 (180-350)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
	Alloy tool steel	280-350	YBM351	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)
			YB9320	220 (170-340)	0.1(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
M	Stainless steel	≤270	YBM351	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)
			YB9320	160 (110-270)	0.1(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
K	Cast iron	180-250	YBG202	160 (120-200)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
			YBD152	270 (150-300)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
S	Difficult-to-machine materials	≤400	YBS303	100 (60-120)	0.1(0.08-0.2)	0.15 (0.1-0.25)	--

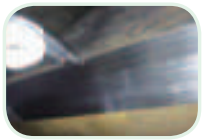
Case for FMP02

Workpiece material：45#
Hardness：175-190（HB）
Cooling: Air cooling
Tool：FMP02-100-B32-SE12-10
Insert：SEET120308PER-APM（YB9320）
Data：
Data 1：Vc=200m/min，fz=0.15mm/z，Ap=7mm，Ae=5mm
Data 2：Vc=200m/min，fz=0.25mm/z，Ap=7mm，Ae=5mm



●SEET120308PER-APM inserts tests

Chipbreaker	Data 1：Vc=200m/min，fz=0.15mm/z Ap=7mm，Ae=5mm		Data 2：Vc=200m/min，fz=0.25mm/z Ap=7mm，Ae=5mm	
	Runout value	Surface machined	Runout value	Surface machined
-APM	0.006		0.006	
Products of company A	0.012		0.012	
Products of company B	0.013		0.015	



-APM

Product of company B

Results:
Comparing with competitors, SEET120308PER-APM inserts can get better surface quality and longer tool life.

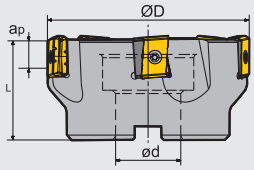
Face milling tools

Kr:90°

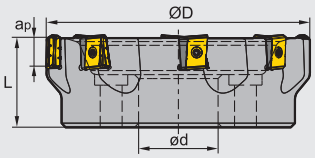
Face milling | Step shoulder

FMP03 P M K

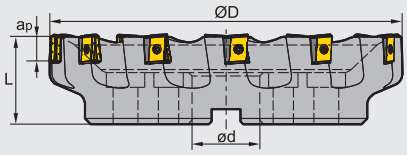
B-type coupling



C-type coupling



D-type coupling



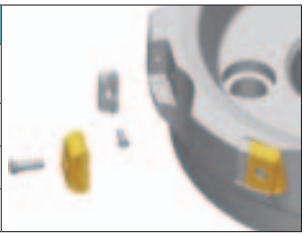
Specification of tools

Type		Stock R	Stock L	ØD	ød	L	a_{pmax}	Number of teeth Z	Style of coupling	Weight (kg)
FMP03	-125-B40-LN15-06	▲	△	125	40	63	13	6	B	3.2
	-160-C40-LN15-08	▲	△	160	40	63	13	8	C	5.1
	-200-C60-LN15-10	▲	△	200	60	70	13	10	C	7.5
	-250-C60-LN15-12	▲	△	250	60	70	13	12	C	12.2
	-315-D60-LN15-16	▲	△	315	60	80	13	16	D	23.7
	-125-B40-LN20-06	▲	△	125	40	63	17	6	B	3.3
	-160-C40-LN20-08	▲	△	160	40	63	17	8	C	5.3
	-200-C60-LN20-10	▲	△	200	60	70	17	10	C	8.8
	-250-C60-LN20-12	▲	△	250	60	70	17	12	C	14.0
	-315-D60-LN20-15	▲	△	315	60	80	17	15	D	23.9
	-125-B40-LN25-05	▲	△	125	40	63	22	5	B	3.3
	-160-C40-LN25-06	▲	△	160	40	63	22	6	C	5.1
	-200-C60-LN25-08	▲	△	200	60	70	22	8	C	8.9
	-250-C60-LN25-10	▲	△	250	60	70	22	10	C	12.0
	-315-D60-LN25-12	▲	△	315	60	80	22	12	D	21.9

▲Stock available △Make-to-order

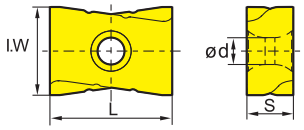
Spare parts

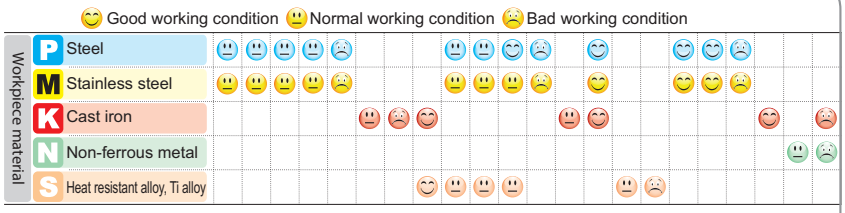
Inserts	Shim	Shim screw	Insert screw	Wrench	
LNKT1506EN-ZR	LLN15-ZR	I60M3×7	I60M4×12	WT15IS	WT09IS
LNKT2007DN-ZR	LLN20R-ZR	I60M3×7	I60M4×15	WT15IS	WT09IS
LNKT2510-ZR	LLN25R-ZR	I60M3.5×10.4	I60M5×17	WT20IT	WT15IS



Tools code key B26–B27 | Grade selection guide B19–B23 | Technical data B245–B250 | Technical information B234–B240

Selection of inserts





Insert shape	Type	Basic dimensions(mm)				CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	l.W	S	ød	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**LNKT1506EN-ZR**	15.875	14	6.35	4.6					○	○						★										
	LNKT2007DN-ZR	20	17	7.94	4.6					○	○						★										
	LNKT2510-ZR	25	18	9.525	5.5					○		○					★										

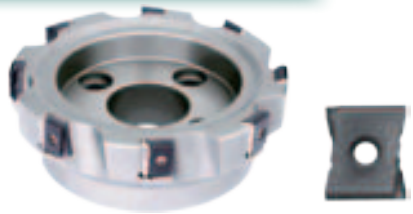
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				Vc(m/min)	fz(mm/z)
P	Low-carbon steel、Soft steel	≤180	YBG302	180 (150-300)	0.5 (0.2-0.8)
			YBM351	180 (150-300)	0.5 (0.2-0.8)
	High-carbon steel、Alloy steel	180-280	YBG302	150 (120-280)	0.5 (0.2-0.8)
			YBM351	140 (120-280)	0.5 (0.2-0.8)
	Alloy tool steel	280-350	YBG302	120 (80-250)	0.45 (0.2-0.6)
			YBM351	100 (80-250)	0.45 (0.2-0.6)
M	Stainless steel	≤270	YBG302	120 (80-200)	0.45 (0.2-0.6)
			YBM351	100 (80-200)	0.45 (0.2-0.6)
K	Cast iron	180-250	YBD152	220 (150-300)	0.5 (0.2-0.8)
			YBD252	210 (150-300)	0.5 (0.2-0.8)
			YBG302	200 (150-300)	0.5 (0.2-0.8)

Note: Cutting parameters can be adjusted according to the Max. power of machine.

Case for FMP03



Tool type：FMP03-200-C60-LN25-08

Insert type/grade：LNKT2510-ZR/YBG302

The tool operates easily and fast at high cutting depth with good chip breaking performance. Cutting efficiency is doubled, and tool life increases to 1-2 times that of the original.

Workpiece material：45#

Hardness(HB)：190

Cooling system: Dry cutting

Cutting parameters：Vc=130m/min, a_p=12mm, f_z=0.5mm/z

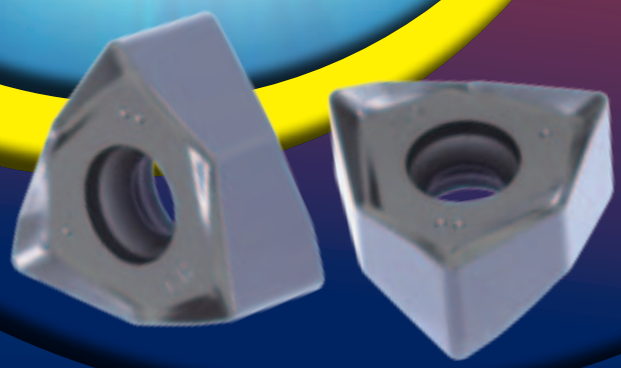
a_e=140mm

FMP12

Series Milling Tools

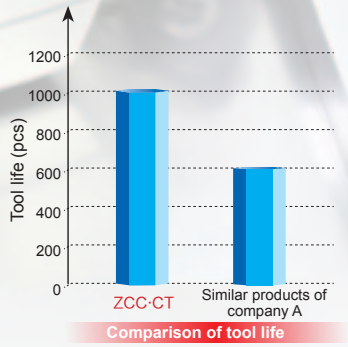
Kr:90°

- **Double negative angle of the cutter, combined with unique insert structure, to achieve double positive tool angle, which is beneficial to reducing cutting force;**
- **6-flute cutting double-sided slot milling inserts, enabling high-quality 90° square shoulder milling, face milling and slot milling;**
- **Insert with wiper enables large feed and better surface finish.**



Application case

Tool specification：FMP12-080-A27-WN08-05C
Insert specification/grade：WNHU080608PNR-GM/YBD152
Part Name: Turbine Housing
Workpiece material：QT450
Hardness：HB230-280
Cooling :Dry cutting
Machine: Vertical machining center
Cutting data：Vc=260m/min，ap=1.0mm，z=0.1mm/z，ae=30mm
Milling style: Down milling　Area of machining: End surface



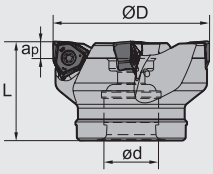
Comparison of tool life

Face milling tools

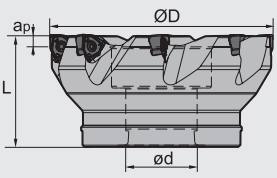
Kr:90°

FMP12 P K N

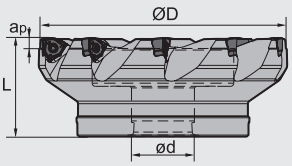
A-type coupling



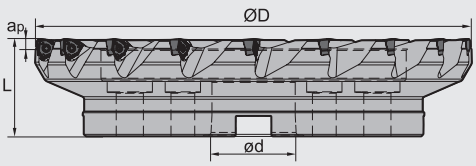
B-type coupling



C-type coupling



D-type coupling



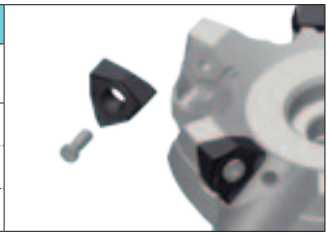
Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth Z	Type of coupling
			ØD	ød	L	$a_p$max		
FMP12	**-050-A22-WN06-05C**	△	50	22	40	5.7	5	A
	-063-A22-WN06-06C	△	63	22	40	5.7	6	A
	-080-A27-WN06-07C	△	80	27	50	5.7	7	A
	-100-B32-WN06-09	△	100	32	50	5.7	9	B
	-125-B40-WN06-11	△	125	40	63	5.7	11	B
	-160-C40-WN06-14	△	160	40	63	5.7	14	C
	-063-A22-WN08-04C	△	63	22	40	7.7	4	A
	-080-A27-WN08-05C	△	80	27	50	7.7	5	A
	-100-B32-WN08-06	△	100	32	50	7.7	6	B
	-125-B40-WN08-08	△	125	40	63	7.7	8	B
	-160-C40-WN08-10	△	160	40	63	7.7	10	C
	-200-C60-WN08-12	△	200	60	63	7.7	12	C
	-250-C60-WN08-14	△	250	60	63	7.7	14	C
	-315-D60-WN08-18	△	315	60	70	7.7	18	D

▲Stock available △Make-to-order

Spare parts

Inserts	Insert screw	Wrench
WNHU06	I60M3×9	WT09IS
WNHU08	I60M4×10	WT15IS

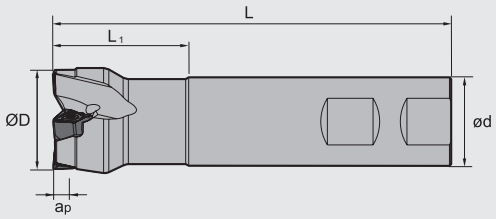


Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Face milling tools

Kr:90°

FMP12 P K



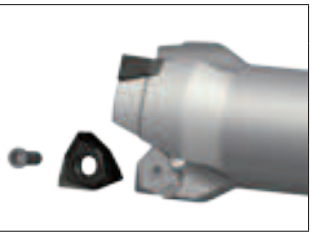
Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Type of coupling
			ØD	ød	L	L1	apmax		
FMP12	**-025-XP25-WN06-02C**	△	25	25	100	30	5.7	2	XP
	-032-XP25-WN06-03C	△	32	25	120	40	5.7	3	XP
	-040-XP32-WN06-04C	△	40	32	140	40	5.7	4	XP
	-050-XP40-WN06-05C	△	50	40	169	40	5.7	5	XP

▲Stock available △Make-to-order

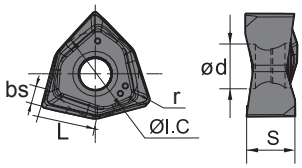
Spare parts

Inserts	Insert screw	Wrench	
			
WNHU06	I60M3×9	WT09IS	
WNHU08	I60M4×10	WT15IS	



Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Selection of inserts



Good working condition 😐 Normal working condition ☹ Bad working condition

Workpiece material		YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
P	Steel	😐	😐	😐	😊	☹				😐	😊	😊	☹		😊			😊	😊	☹			
M	Stainless steel	😐	😐	😐	😐	☹				😐	😐	😐	☹		😊			😊	😊	☹			
K	Cast iron						😐	☹	😊					😐	😊						😊		☹
N	Non-ferrous metal																					😐	☹
S	Heat resistant alloy, Ti alloy								😊	😐	😐	😐				😐	☹						

Insert shape	Type	Basic dimensions(mm) L	ØI.C	S	ød	bs	r	CVD Coating YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	PVD Coating YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	Cermet YNG151	YNG151C	Cemented carbide YC30S	YD051	YD101	YD201
	**WNHU060404PNR-GM**	5.7	9.525	4.0	3.5	1.35	0.4				★		★				★	★											
	WNHU060408PNR-GM	5.7	9.525	4.0	3.5	1.35	0.8				★		★				★	★											
	WNHU080608PNR-GM	7.7	12.7	5.4	4.4	1.6	0.8				★		★				★	★											
	WNHU080612PNR-GM	7.7	12.7	5.4	4.4	1.6	1.2				★		★				★	★											
	WNHU080616PNR-GM	7.7	12.7	5.4	4.4	1.6	1.6				★		★				★	★											
	**WNMU060408PNN-GM**	5.7	9.525	4.0	3.5	1.35	0.8				★		★				★	★											
	WNMU080608PNN-GM	7.7	12.7	5.4	4.4	1.6	0.8				★		★				★	★											
	**WNHU080608PNR-LH**	7.7	12.7	5.4	4.4	1.6	0.8																				★	

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

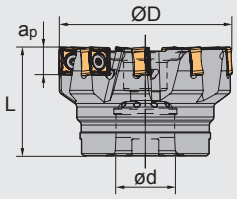
Workpiece material		Hardness HB	Insert grade	Cutting parameters V_c(m/min)	f_z(mm/z)	a_{pmax}(mm)
P	Low-carbon steel、Soft steel	⩽180	YBM253 YBG205 YB9320	280(220-360)	0.2 (0.1-0.4)	5.7(WN06) 7.7(WN08)
	High-carbon steel、Alloy steel	180-280	YBM253 YBG205 YB9320	260 (200-340)	0.2 (0.1-0.4)	
	Alloy tool steel	280-350	YBM253 YBG205 YB9320	240 (180-320)	0.2(0.1-0.4)	
K	Cast iron	180-250	YBD152	280 (150-320)	0.2(0.1-0.4)	
N	Aluminium alloy	--	YD101	300-	0.25(0.1-0.4)	

Face milling tools

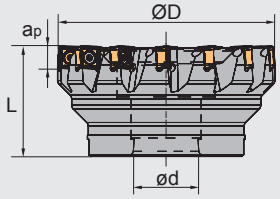
Kr:88°

FMP17 P M K S

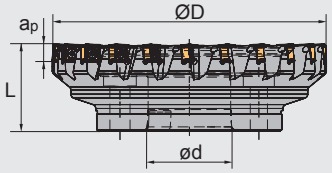
A-type coupling



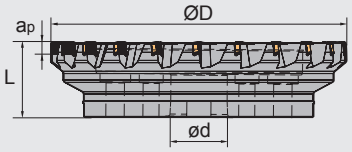
B-type coupling



C-type coupling



D-type coupling



Specification of tools

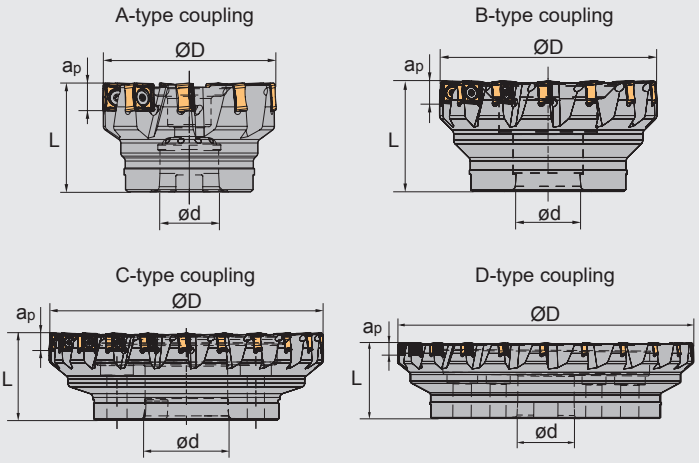
Type		Stock	Basic dimensions(mm)				Number of teeth Z	Type of coupling	Weight (kg)
			ØD	ød	L	$a_p$max			
FMP17 Coarse pitch	**-050-A22-SN12-04C**	▲	50	22	40	10.5	4	A	0.296
	-063-A22-SN12-05C	▲	63	22	40	10.5	5	A	0.462
	-080-A27-SN12-07C	▲	80	27	50	10.5	7	A	1.000
	-100-A32-SN12-08	▲	100	32	50	10.5	8	A	1.577
	-125-B40-SN12-10	▲	125	40	63	10.5	10	B	3.043
	-160-C40-SN12-12	▲	160	40	63	10.5	12	C	4.344
	-200-C60-SN12-14	▲	200	60	63	10.5	14	C	6.552
	-200-C60-SN12-14	▲	250	60	63	10.5	18	C	13.025
	-315-D60-SN12-22	▲	315	60	80	10.5	22	D	21.935
	-400-D60-SN12-28	▲	400	60	80	10.5	28	D	41.661

▲Stock available △Make-to-order

Face milling tools

Kr:88°

FMP17 P M K S



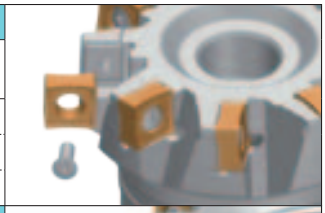
Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth Z	Type of coupling	Weight (kg)
			ØD	ød	L	$a_p$max			
FME17 Close pitch	**-050-A22-SN12-05C**	▲	50	22	40	10.5	5	A	0.288
	-063-A22-SN12-07C	▲	63	22	40	10.5	7	A	0.466
	-080-A27-SN12-09C	▲	80	27	50	10.5	9	A	1.02
	-100-A32-SN12-11C	▲	100	32	50	10.5	11	A	1.592
	-125-B40-SN12-14	▲	125	40	63	10.5	14	B	3.033
	-160-C40-SN12-18	▲	160	40	63	10.5	18	C	4.431
	-200-C60-SN12-22	▲	200	60	63	10.5	22	C	6.711
	-125-B40-SN12-14W2	▲	125	40	63	10.5	12+2	B	2.996
	-160-C40-SN12-18W3	▲	160	40	63	10.5	15+3	C	4.667
	-200-C60-SN12-24W4	▲	200	60	63	10.5	20+4	C	8.949

▲Stock available △Make-to-order

Spare parts

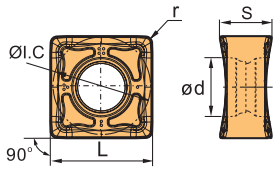
Diameter ØD	Insert	Insert screw	Wrench
			
Ø50-Ø63	SNGX□□PNN-GH/GL/GM SNMX□□□-GH/GL/GM	IRM4×10	WT15IP
Ø80-Ø125			WT15IS
Ø160-Ø400			WT15IT

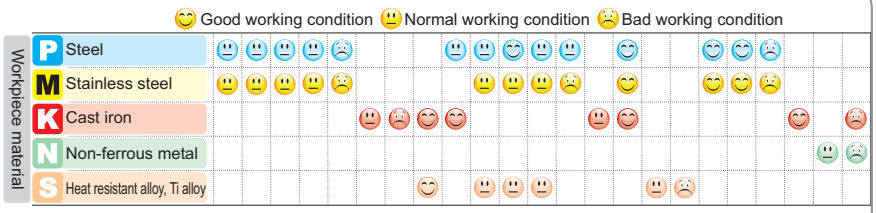


Diameter ØD	Insert	Insert screw	Wedge screw	Adjustment block	Wrench
					
Ø125-Ø200	SNG□□XPNN-GH/GL/GM SNMX□□□-GH/GL/GM SNCU120420-W4	IRM4×10	DM6X20A	ADJ-M6X1.0A	WT15IT

Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Selection of inserts





Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating									Cermet		Cemented carbide			
		L	ØI.C	S	ød	r	$a_p$max	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG105	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SNGX1205PNN-GL	12.7	12.7	6.5	5.9	0.8	10.5				●		●						★											
	SNMX120512-GL	12.7	12.7	6.5	5.9	1.2	10.5				●		●						★											
	SNGX1205PNN-GM	12.7	12.7	6.5	5.9	0.8	10.5				●		●						★					●					
	SNMX120512-GM	12.7	12.7	6.5	5.9	1.2	10.5				●		●						★					●					
	SNGX1205PNN-GH	12.7	12.7	6.5	5.9	0.8	10.5				●		●						★										
	SNMX120512-GH	12.7	12.7	6.5	5.9	1.2	10.5				●		●						★										
	SNCU120420-W4	12.7	12.7	4.8	5.9	2	10.5								●														

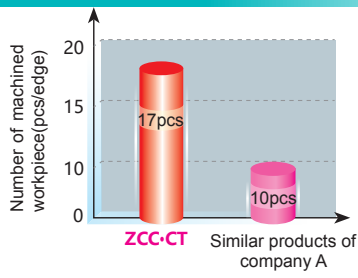
●Inserts are suitable for both left and right cuts ★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters			
				V_c(m/min)	f_z(mm/z)		
					-GL	-GM	-GH
P	Low-carbon steel、Soft steel	⩽ 180	YBM253 YB9320	270(220-350)	0.15(0.1-0.3)	0.2(0.1-0.4)	0.3(0.2-0.5)
P	High-carbon steel、Alloy steel	180-280	YBM253 YB9320	260(220-320)	0.15(0.1-0.3)	0.2(0.1-0.4)	0.3(0.2-0.5)
P	Alloy tool steel	280-350	YBM253 YB9320	240(180-300)	0.15(0.1-0.3)	0.2(0.1-0.4)	0.3(0.2-0.5)
M	Stainless steel	⩽ 270	YBM253 YB9320	160(110-270)	0.1(0.08-0.2)	0.15(0.1-0.3)	0.2(0.1-0.3)
K	Cast iron、Ductile iron、High nickel cast iron	180-250	YBD152	270(150-300)	0.2(0.1-0.3)	0.3(0.1-0.4)	0.4(0.2-0.5)
S	hard-to-cut material	⩽ 400	YBS303	100(60-120)	--	0.15(0.1-0.25)	--

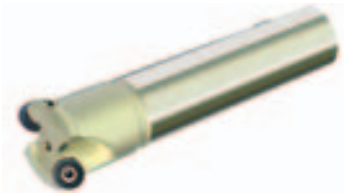
Case for FMP17

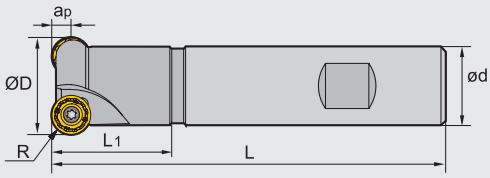
Workpiece：Truck axle housing
Workpiece material：QT600(HB250)
Tool type：FMP17-100-A32-SN12-08C
Insert：SNGX1205PNN-GM/YB9320
Cutting parameters：Vc=267m/min,fz=0.18mm/z, ap=1.5mm,ae=90mm
Cooling：External coolant



Face milling tools

FMR01 P M K S



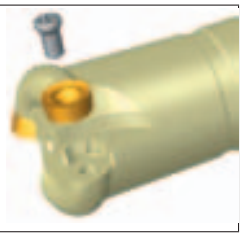


Specification of tools

Type		Stock	Basic dimensions(mm)						Number of teeth Z	Weight (kg)
			ØD	ød	L	L_1	R	a_{pmax}		
FMR01	**-025-XP20-RC10-02**	▲	25	20	100	30	5	5	2	0.2
	-032-XP25-RC10-02	▲	32	25	120	35	5	5	2	0.5
	-040-XP32-RC12-03	▲	40	32	120	40	6	6	3	0.7
	-050-XP32-RC12-03	▲	50	32	120	40	6	6	3	0.8

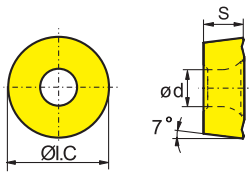
▲Stock available △Make-to-order

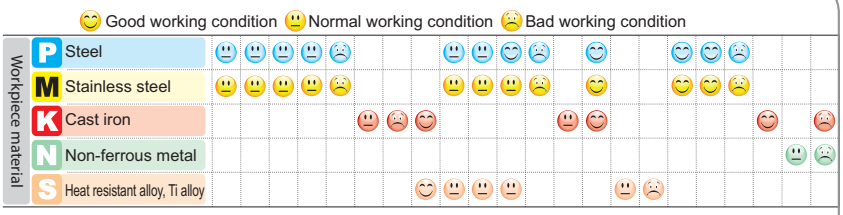
Spare parts

Diameter ØD	Insert screw	Wrench	
			
Ø25 -Ø32	I60M4×8.4	WT15S	
Ø40 -Ø50	I60M3.5×10		

Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Selection of inserts





Insert shape	Type	Basic dimensions(mm)			CVD Coating							PVD Coating									Cermet		Cemented carbide			
		ØI.C	S	ød	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**RCKT10T3MO-DM**	10.0	3.97	4.4	●								●	★												
	**RCKT1204MO-DM**	12.0	4.76	4.0	●		●		●	○			●	★		★										
	**RCKT1204MO-DR**	12.0	4.76	4.0	○		○		○				●	★												
	**RCKT1204MO-ER**	12.0	4.76	4.0				★																		
	**RCKT1204MO-NM**	12.0	4.76	4.0				○							○	○			○	○						

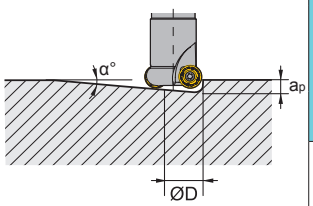
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters			
				V_c(m/min)	f_z(mm/z)		
					-DM	-DR	-NM
P	Low-carbon steel、Soft steel	⩽180	YBM251 YBC301	270 (220-350)	0.2(0.1-0.5)	0.3 (0.2-0.8)	
			YBM351 YBC302	220 (180-300)	0.25(0.1-0.5)	0.3 (0.2-0.8)	
			YBG202 YBG205 YB9320	270 (200-360)	0.2(0.1-0.5)	0.3 (0.2-0.8)	0.2 (0.1-0.5)
	High-carbon steel、Alloy steel	180-280	YBM251 YBC301	240 (200-320)	0.2(0.1-0.5)	0.3 (0.2-0.8)	
			YBM351 YBG302	200 (160-280)	0.25(0.1-0.5)	0.3 (0.2-0.8)	0.2 (0.1-0.5)
			YBG202 YBG205 YB9320	240 (180-350)	0.2(0.1-0.5)	0.3 (0.2-0.8)	0.2 (0.1-0.5)
	Alloy tool steel	280-350	YBM251 YBC301	220 (180-300)	0.2(0.1-0.4)	0.3 (0.2-0.6)	
			YBM351 YBG302	180 (150-250)	0.2(0.1-0.5)	0.3 (0.2-0.8)	0.2 (0.1-0.4)
			YBG202 YBG205 YB9320	220 (170-340)	0.2(0.1-0.4)	0.3 (0.2-0.6)	0.2 (0.1-0.4)
M	Stainless steel	⩽270	YBM251	150 (120-240)	0.2(0.1-0.4)	0.3 (0.2-0.6)	
			YBM253 YBM351	150 (100-220)	0.2(0.1-0.4)	0.3 (0.2-0.6)	0.2 (0.1-0.4)
			YBG202 YBG205 YB9320	160 (110-270)	0.2(0.1-0.4)	0.3 (0.2-0.6)	0.2 (0.1-0.4)
K	Cast iron	180-250	YBG302	210 (120-300)	0.2(0.1-0.5)	0.3 (0.2-0.8)	0.2 (0.1-0.5)
			YBD152	240 (180-300)	0.2(0.1-0.3)		
S	hard-to-cut material	⩽400	YBS203 YBS303	100 (60-120)			0.15 (0.1-0.3)

Ramp milling, helical interpolation milling

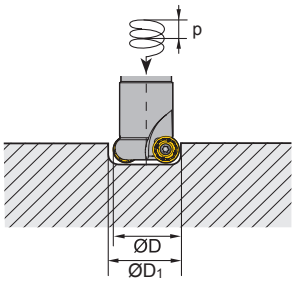
● Ramp milling



$$L_m = \frac{a_p}{\tan\alpha}$$

α:Plunge angle

● Helical interpolation milling



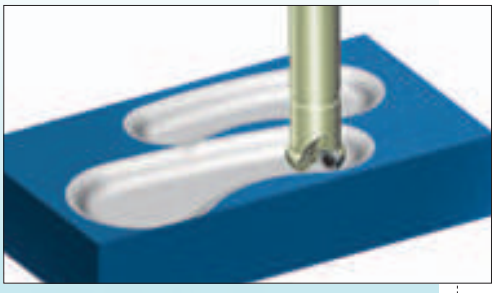
$$P = \tan\alpha \times \pi \times D_1$$

α:Helix angle

Insert	Diameter ØD(mm)	Ramp milling			Helical interpolation milling	
		Max.cutting depth	Max.cutting depth	Min.length	Min.diameter	Max.diameter
		ap(mm)	α°	L_m(mm)	$ØD_1$(mm)	(mm)
RCKT10**	25	5	14.4	19.5	40	5
	32	5	8.4	34	54	5
RCKT12**	40	6	10.3	33.2	68	6
	50	6	7.1	48	88	6

Reduce the feed rate when plunging and circular milling.
Attention-drilling lead to long chips.

Case for FMR01



Workpiece material：42CrMo (HRC35)
Cooling system: Dry cutting
Machine: Vertical machining center
Cutting parameters：
Vc=200m/min
a_p=3mm
f_z=0.2mm/z

Tool type：FMR01-025-XP20-RC10-02
Insert type/grade：RCKT10T3MO-DM/YBG202

●Comparison of insert abrasion

ZCC·CT

22minutes later

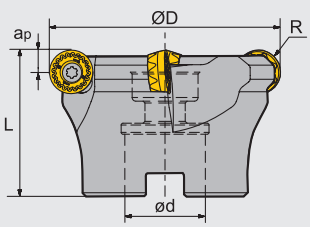
Similar overseas products

22minutes later

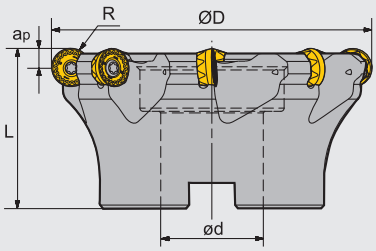
Face milling tools

FMR02 P M K S

A-type coupling



B-type coupling



Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
			ØD	ød	L	R	a_{pmax}			
FMR02 Coarse pitch	**-050-A22-RC12-03**	△	50	22	40	6	6	3	A	0.29
	-063-A22-RC12-04	▲	63	27	50	6	6	4	A	0.41
	-080-B27-RC12-05	▲	80	27	50	6	6	5	B	0.81
	-100-B32-RC12-06	△	100	32	50	6	6	6	B	1.25
	-063-A22-RC16-04	△	63	22	40	8	8	4	A	0.35
	-080-B27-RC16-05	△	80	27	50	8	8	5	B	0.74
	-100-B32-RC16-06	▲	100	32	50	8	8	6	B	1.18
	-125-B40-RC16-07	△	125	40	63	8	8	7	B	2.49
	-080-A27-RC20-04	△	80	27	50	10	10	4	A	0.77
	-100-B32-RC20-05	△	100	32	50	10	10	5	B	1.07
	-125-B40-RC20-06	△	125	40	63	10	10	6	B	2.42
	-160-B40-RC20-06	△	160	40	63	10	10	6	B	4.17
Close pitch	**-050-A22-RC12-05**	△	50	22	40	6	6	5	A	0.27
	-063-A22-RC12-06	△	63	27	50	6	6	6	A	0.38
	-080-B27-RC12-07	△	80	27	50	6	6	7	B	0.79
	-100-B32-RC12-08	△	100	32	50	6	6	8	B	1.23
	-063-A22-RC16-05	△	63	22	40	8	8	5	A	0.34
	-080-B27-RC16-07	△	80	27	50	8	8	7	B	0.72
	-100-B32-RC16-08	△	100	32	50	8	8	8	B	1.17
	-125-B40-RC16-09	△	125	40	63	8	8	9	B	2.47
	-080-A27-RC20-05	△	80	27	50	10	10	5	A	0.74
	-100-B32-RC20-06	△	100	32	50	10	10	6	B	1.07
	-125-B40-RC20-07	△	125	40	63	10	10	7	B	2.39
	-160-B40-RC20-08	△	160	40	63	10	10	8	B	4.06

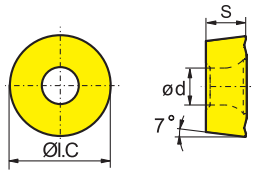
▲Stock available △Make-to-order

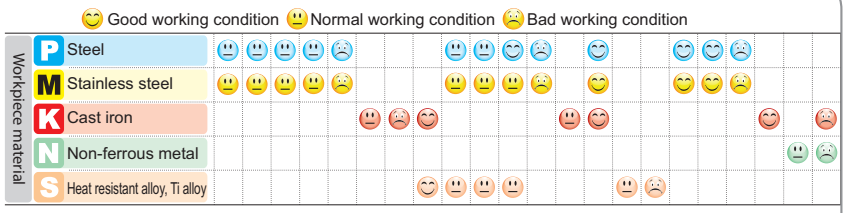
Spare parts

Diameter ØD	Insert	Insert screw	Wrench	
				
Ø50 -Ø100	RC□□1204MO-□□	I60M3.5×10	WT15IS	--
Ø63 -Ø125	RC□□1606MO-□□	I60M5×13	--	WT20IT
Ø125 -Ø160	RC□□2006MO-□□	I43M6×16	--	WT25IT

Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Selection of inserts

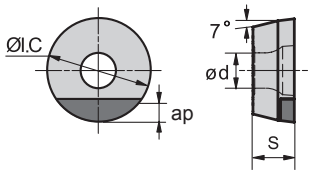


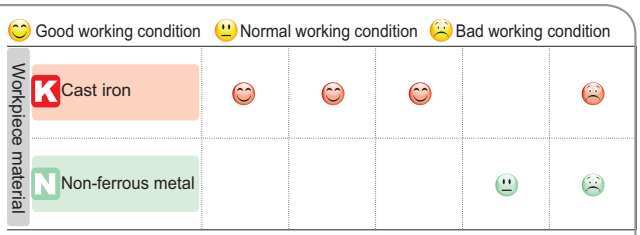


Insert shape	Type	Basic dimensions(mm)			CVD Coating							PVD Coating								Cermet		Cemented carbide			
		ØI.C	S	ød	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**RCKT1204MO-DM**	12.0	4.76	4.0	●		●		●	○			●	★		●										
	RCKT1606MO-DM	16.0	6.35	5.56	●											●										
	**RCKT1204MO-DR**	12.0	4.76	4.0	○		○		○				●	★												
	RCKT1606MO-DR	16.0	6.35	5.56	●				●		○		●	★												
	RCKT2006MO-DR	20.0	6.35	6.55	●				●		○		○	★		●										
	**RCKT1204MO-ER**	12.0	4.76	4.0				★																		
	RCKT1606MO-ER	16.0	6.35	5.56				★																		
	RCKT2006MO-ER	20.0	6.35	6.55				★																		
	**RCKT1204MO-NM**	12.0	4.76	4.0				○							○	○			○	○						
	RCKT1606MO-NM	16.0	6.35	5.56				○							○	○			○	○						

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Selection of inserts





Insert shape	Type	Basic dimensions(mm)				PCBN		Cemented carbide		
		ØI.C	S	ød	apmax	BK1041	BK2531	YD051	YD101	YD201
	**RCMW1204MOBS01225**	12.0	4.76	4.1	2.7	○	○			
	RCMW1204MOAS01225	12.0	4.76	4.1	2.7	○	○			

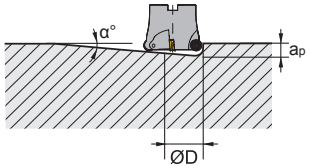
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters					
				V_c(m/min)	f_z(mm/z)				
					-DM	-DR	-ER	-PCBN	-NM
P	Low-carbon steel、Soft steel	⩽HB180	YBM251 YBC301	270 (220-350)	0.2(0.1-0.5)	0.3 (0.2-0.8)			
			YBM351 YBG302	220 (180-300)	0.25(0.1-0.5)	0.3 (0.2-0.8)			0.25 (0.1-0.5)
			YBG202 YBG205 YB9320	270 (200-360)	0.2(0.1-0.5)	0.3 (0.2-0.8)			0.2 (0.1-0.5)
	High-carbon steel、Alloy steel	HB180-280	YBM251 YBC301	240 (200-320)	0.2(0.1-0.5)	0.3 (0.2-0.8)			
			YBM351 YBG302	200 (160-280)	0.25(0.1-0.5)	0.3 (0.2-0.8)			0.25 (0.1-0.5)
			YBG202 YBG205 YB9320	240 (180-350)	0.2(0.1-0.5)	0.3 (0.2-0.8)			0.2 (0.1-0.5)
	Alloy tool steel	HB280-350	YBM251 YBC301	220 (180-300)	0.2(0.1-0.4)	0.3 (0.2-0.6)			
			YBM351 YBG302	180 (150-250)	0.2(0.1-0.5)	0.3 (0.2-0.8)			0.2 (0.1-0.5)
			YBG202 YBG205 YB9320	220 (170-340)	0.2(0.1-0.4)	0.3 (0.2-0.6)			0.2 (0.1-0.4)
M	Stainless steel	⩽HB270	YBM251	150 (120-240)	0.2(0.1-0.4)	0.3 (0.2-0.6)			
			YBM253	150 (100-220)	0.2(0.1-0.4)	0.3 (0.2-0.6)	0.3(0.2-0.6)		0.2 (0.1-0.4)
			YBM351	150 (100-220)	0.2(0.1-0.4)	0.3 (0.2-0.6)			
			YBG202 YBG205 YB9320	160 (110-270)	0.2(0.1-0.4)	0.3 (0.2-0.6)			0.2 (0.1-0.4)
K	Quenching steel、Cast iron	HB180-250	YBG302	210 (120-300)	0.2(0.1-0.5)	0.3 (0.2-0.8)			0.2 (0.1-0.5)
			BK2531	150 (100-500)				0.15 (0.1-0.5)	
			BK1041	800 (500-1200)				0.2 (0.1-0.5)	
			YBD152	240 (180-300)	0.2(0.1-0.3)				
			YBD252	220 (180-300)		0.2 (0.1-0.3)			
S	Difficult-to-machine materials	⩽400	YBS203 YBS303	100 (60-120)					0.15 (0.1-0.3)

Ramp milling, helical interpolation milling

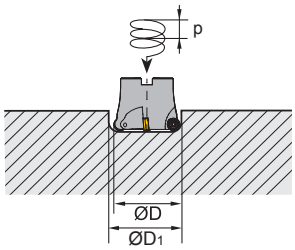
● Ramp milling



$L_m = \frac{a_p}{\tan\alpha}$

α:Plunge angle

● Helical interpolation milling



$P = \tan\alpha \times \pi \times D_1$

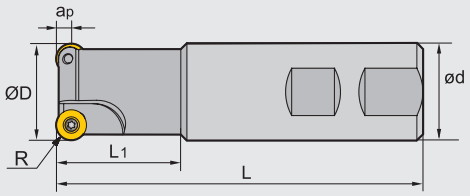
α:Helix angle

Insert	Diameter ØD(mm)	Ramp milling			Helical interpolation milling	
		Max.cutting depth	Max.cutting depth	Min.length	Min.diameter	Max.diameter
		ap(mm)	α°	L_m(mm)	$ØD_1$(mm)	(mm)
RCKT12**	50	6	7	48.9	88	6
	63	6	5.1	67.5	114	6
	80	6	3.7	94.1	148	6
	100	6	2.7	127.2	188	6
RCKT16**	63	8	8	56.9	110	8
	80	8	5.6	81.6	144	8
	100	8	4.1	110.8	184	8
	125	8	3.4	136.7	234	8
RCKT20**	80	10	8	71.2	140	10
	100	10	5.7	100.2	180	10
	125	10	4.2	136.2	230	10
	160	10	3	190.8	300	10

Reduce the feed rate when plunging and circular milling.
Attention-drilling lead to long chips.

Face milling tools

FMR03 P M K S



Specification of tools

Type		Stock	Basic dimensions(mm)						Number of teeth Z	Weight (kg)
			ØD	ød	L	L_1	R	a_{pmax}		
FMR03	**-016-XP16-RD08-02**	▲	16	16	100	25	4	4	2	0.1
	-025-XP25-RD08-02	▲	25	25	100	30	4	4	2	0.3
	-032-XP32-RD10-02	▲	32	32	120	40	5	5	2	0.7
	-040-XP32-RD12-03	▲	40	32	120	40	6	6	3	0.7
	-050-XP32-RD12-04	▲	50	32	120	40	6	6	4	0.8

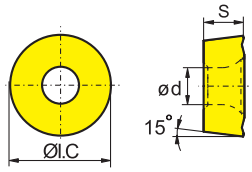
▲Stock available △Make-to-order

Spare parts

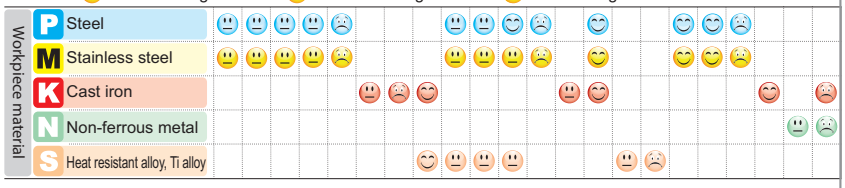
Diameter ØD	Insert screw	Wrench
		
Ø16-Ø25	I60M3×7	WT09IP
Ø32-Ø50	I60M4×10	WT15IP

Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Selection of inserts



Good working condition Normal working condition Bad working condition



Insert shape	Type	Basic dimensions(mm)			CVD Coating							PVD Coating								Cermet		Cemented carbide			
		ØI.C	S	ød	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	RDKW0803MO	8	3.18	3.4	○				○				●	★		○										
	RDKW10T3MO	10	3.97	4.4	○				●				●	★												
	RDKW1204MO	12	4.76	4.4	●		●		●				●	★		●										
	RDKT10T3MO-NM	10	3.97	4.4										○					○	○						

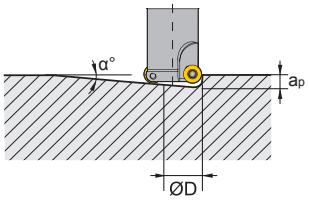
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				V_c(m/min)	f_z(mm/z)
P	Low-carbon steel、Soft steel	≤180	YBM251 YBC301	270 (220-350)	0.2 (0.08-0.45)
			YBM351 YBG302	220 (180-300)	0.25 (0.15-0.45)
			YBG202 YBG205	270 (200-360)	0.2 (0.1-0.45)
	High-carbon steel、Alloy steel	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 YBG205	240 (180-350)	0.2 (0.1-0.45)
	Alloy tool steel	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 YBG205	220 (170-340)	0.2 (0.1-0.45)
M	Stainless steel	≤270	YBG205	150 (120-240)	0.2 (0.08-0.45)
			YBM251	150 (120-240)	0.2 (0.08-0.45)
			YBM351	150 (100-220)	0.25 (0.1-0.45)
			YBG202 YBG205	160 (110-270)	0.2 (0.1-0.45)
K	Cast iron	180-250	YBG302	210 (120-300)	0.2 (0.1-0.45)
S	Difficult-to-machine materials	≤400	YBS203 YBS303	100 (60-120)	0.15 (0.1-0.3)

Ramp milling, helical interpolation milling

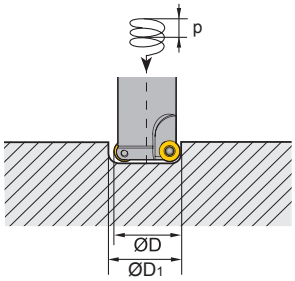
● Ramp milling



$$L_m = \frac{a_p}{\tan\alpha}$$

α:Plunge angle

● Helical interpolation milling



$$P = \tan_{\alpha} \times \pi \times D_1$$

α:Helix angle

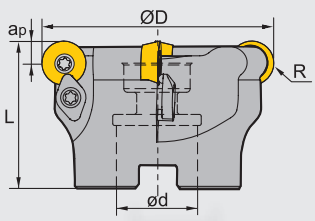
Insert	Diameter ØD(mm)	Ramp milling			Helical interpolation milling	
		Max.cutting depth	Max.cutting depth	Min.length	Min.diameter	Max.diameter
		ap(mm)	α°	L_m(mm)	$ØD_1$(mm)	(mm)
RD*08**	16	4	12.2	18.5	24	4
	25	4	8.8	25.8	42	4
RD*10**	32	5	8.4	34	54	5
RD*12**	40	6	10.3	33	68	6
	50	6	7.1	48	88	6

Reduce the feed rate when plunging and circular milling.
Attention-drilling lead to long chips.

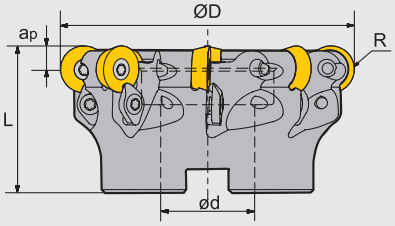
Face milling tools

FMR04 P M K

A-type coupling



B-type coupling



Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
			ØD	ød	L	R	a_{pmax}			
FMR04 Coarse pitch	**-050-A22-RD12-03**	▲	50	22	40	6	6	3	A	0.25
	-063-A22-RD12-04	▲	63	22	40	6	6	4	A	0.37
	-080-B27-RD12-05	▲	80	27	50	6	6	5	B	0.77
	-063-A22-RD16-04	△	63	22	40	8	8	4	A	0.32
	-080-B27-RD16-05	△	80	27	50	8	8	5	B	0.67
	-100-B32-RD16-06	▲	100	32	50	8	8	6	B	1.18
	-125-B40-RD16-08	△	125	40	63	8	8	8	B	2.55
	-125-B40-RD20-06	▲	125	40	63	10	10	6	B	2.33
	-160-B40-RD20-07	▲	160	40	63	10	10	7	B	3.83
Close pitch	**-050-A22-RD12-05**	△	50	22	40	6	6	5	A	0.23
	-063-A22-RD12-06	△	63	22	40	6	6	6	A	0.48
	-080-B27-RD12-07	△	80	27	50	6	6	7	B	0.78
	-063-A22-RD16-05	△	63	22	40	8	8	5	A	0.3
	-080-B27-RD16-07	△	80	27	50	8	8	7	B	0.66
	-100-B32-RD16-08	△	100	32	50	8	8	8	B	1.18
	-125-B40-RD16-10	△	125	40	63	8	8	10	B	2.51
	-125-B40-RD20-08	△	125	40	63	10	10	8	B	2.45
	-160-B40-RD20-10	△	160	40	63	10	10	10	B	3.98

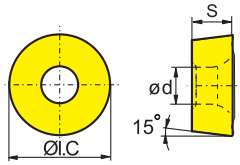
▲Stock available △Make-to-order

Spare parts

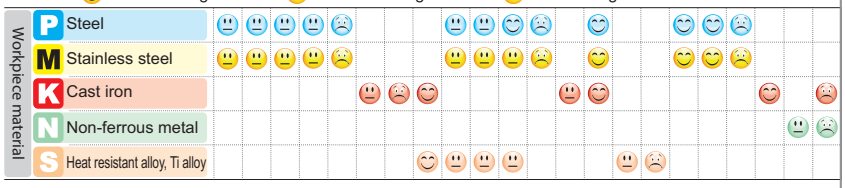
Diameter ØD	Insert	Insert screw	Clamp	Clamp screw	Wrench	
						
Ø50-Ø80	RDKW1204MO	I60M3.5×10	WD-204	I60M4×10	WT15IP	--
Ø63 -Ø125	RDKW1605MO	I60M5×13	WD-207	I60M5×13	--	WT20IT
Ø125 -Ø160	RDKW2006MO	I43M6×16	--	--	--	WT25IT

Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Selection of inserts



Good working condition Normal working condition Bad working condition



Insert shape	Type	Basic dimensions(mm)			CVD Coating							PVD Coating								Cermet		Cemented carbide			
		ØI.C	S	ød	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	RDKW1204MO	12.0	4.76	4.4	●		●		●				●	★		●										
	RDKW1605MO	16.0	5.56	5.5	○				○				○	★		○										
	RDKW2006MO	20.0	6.35	6.5	○				○					○												

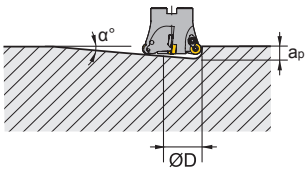
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				Vc(m/min)	f(mm/z)
P	Low-carbon steel、Soft steel	≤180	YBM251 YBC301	270 (220-350)	0.2 (0.08-0.45)
			YBM351 YBG302	220 (180-300)	0.25 (0.15-0.45)
			YBG202 YBG205	270 (200-360)	0.2 (0.1-0.45)
	High-carbon steel、Alloy steel	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 YBG205	240 (180-350)	0.2 (0.1-0.45)
	Alloy tool steel	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 YBG205	220 (170-340)	0.2 (0.1-0.45)
M	Stainless steel	≤270	YBG205	150 (120-240)	0.2 (0.08-0.45)
			YBM251	150 (120-240)	0.2 (0.08-0.45)
			YBM351 YBG302	150 (100-220)	0.25 (0.1-0.45)
			YBG202 YBG205	160 (110-270)	0.2 (0.1-0.45)
K	Cast iron	180-250	YBG302	210 (120-300)	0.2 (0.1-0.45)

Ramp milling, helical interpolation milling

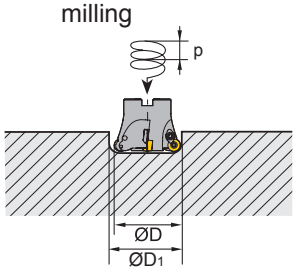
● Ramp milling



$$L_m = \frac{a_p}{\tan\alpha}$$

α:Plunge angle

● Helical interpolation milling



$$P = \tan\alpha \times \pi \times D_1$$

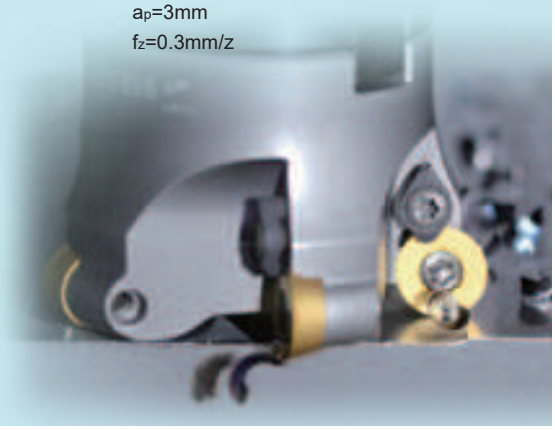
α:Helix angle

Insert	Diameter ØD(mm)	Ramp milling			Helical interpolation milling	
		Max.cutting depth	Max.cutting depth	Min.length	Min.diameter	Max.diameter
		ap(mm)	α°	L_m(mm)	$ØD_1$(mm)	(mm)
RD*12**	50	6	7.1	48	88	6
	63	6	5.1	67	114	6
	80	6	3.6	93	148	6
RD*16**	63	8	8	56.5	110	8
	80	8	5.6	81.5	144	8
	100	8	4.1	110.5	184	8
	125	8	3.4	136.5	234	8
RD*120**	125	10	4.2	136.2	230	10
	160	10	3	190.5	300	10

Reduce the feed rate when plunging and circular milling.
Attention-drilling lead to long chips.

Case for FMR04

Workpiece material：42CrMo (HRC35)
Cooling system: Dry cutting
Machine: Vertical machining center
Cutting parameters：
V_c=200m/min
a_p=3mm
f_z=0.3mm/z



Tool type：FMR04-063-A22-RD12-04

Insert type/grade：RDKW1204MO/YBG202

●Abrasion comparison after 90 minutes cavity milling

ZCC-CT

Similar overseas products

Square shoulder milling tools

Kr:90°


Step shoulder


Slot milling

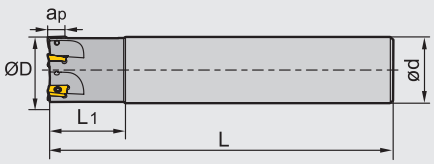

Ramp milling


Helical machining


Plunge milling

EMP01 P M K S N

Straight shank



Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Weight (kg)
			ØD	ød	L	L_1	$a_p$max		
EMP01 Straight shank	**-010-G10-AP07-02C(25/85)**	△	10	10	85	25	6.0	2	0.043
	-010-G10-AP07-02C(25/120)	△	10	10	120	25	6.0	2	0.063
	-012-G12-AP07-02C(25/85)	△	12	12	85	25	6.0	2	0.061
	-012-G12-AP07-02C(25/120)	△	12	12	120	25	6.0	2	0.089
	-014-G16-AP07-03C(25/85)	△	14	16	85	25	6.0	3	0.104
	-014-G16-AP07-03C(25/120)	△	14	16	120	25	6.0	3	0.153
	-016-G16-AP07-03C(25/85)	△	16	16	85	25	6.0	3	0.112
	-016-G16-AP07-03C(25/120)	△	16	16	120	25	6.0	3	0.162
	-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
	-016-G16-AP11-02C(25/85)	△	16	16	85	25	10.5	2	0.108
	-016-G16-AP11-02C(25/120)	△	16	16	120	25	10.5	2	0.16
	-016-G16-AP11-02C(25/180)	△	16	16	180	25	10.5	2	0.248
	-020-G16-AP11-03C(25/85)	△	20	16	85	25	10.5	3	0.121
	-020-G20-AP11-02	▲	20	20	100	30	10.5	2	0.2
	-020-G20-AP11-02C(30/100)	△	20	20	100	30	10.5	2	0.18
	-020-G20-AP11-02C(30/150)	△	20	20	150	30	10.5	2	0.312
	-020-G20-AP11-02C(30/200)	△	20	20	200	30	10.5	2	0.401
	-020-G20-AP11-03C(30/100)	△	20	20	100	30	10.5	3	0.2
	-020-G20-AP11-03C(30/150)	△	20	20	150	30	10.5	3	0.357
	-020-G20-AP11-03C(30/200)	△	20	20	200	30	10.5	3	0.424
	-025-G25-AP11-03	▲	25	25	115	35	10.5	3	0.4
	-025-G25-AP11-03C(35/115)	△	25	25	115	35	10.5	3	0.357
	-025-G25-AP11-03C(35/170)	△	25	25	170	35	10.5	3	0.577
	-025-G25-AP11-03C(35/220)	△	25	25	220	35	10.5	3	0.758
	-025-G25-AP11-04C(35/115)	△	25	25	115	35	10.5	4	0.376
	-025-G25-AP11-04C(35/170)	△	25	25	170	35	10.5	4	0.575
	-025-G25-AP11-04C(35/220)	△	25	25	220	35	10.5	4	0.686

▲Stock available △Make-to-order

EMP01-010-G10-AP07-02C(25/85)

Effective cutting depth/Overall length

Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Weight (kg)
			ØD	ød	L	L_1	apmax		
EMP01 Straight shank	**-030-G25-AP11-04C(35/115)**	△	30	25	115	35	10.5	4	0.411
	-030-G25-AP11-04C(35/170)	△	30	25	170	35	10.5	4	0.61
	-030-G25-AP11-04C(35/220)	△	30	25	220	35	10.5	4	0.791
	-032-G32-AP11-04	▲	32	32	125	40	10.5	4	0.7
	-032-G32-AP11-04C(45/125)	△	32	32	125	45	10.5	4	0.673
	-032-G32-AP11-04C(45/190)	△	32	32	190	45	10.5	4	1.057
	-032-G32-AP11-04C(45/260)	△	32	32	260	45	10.5	4	1.47
	-032-G32-AP11-05C(45/125)	△	32	32	125	45	10.5	5	0.71
	-032-G32-AP11-05C(45/190)	△	32	32	190	45	10.5	5	1.054
	-032-G32-AP11-05C(45/260)	△	32	32	260	45	10.5	5	1.53
	-025-G25-AP16-02	▲	25	25	115	35	15.5	2	0.4
	-025-G25-AP16-02C(35/115)	△	25	25	115	35	15.5	2	0.374
	-025-G25-AP16-02C(35/170)	△	25	25	170	35	15.5	2	0.496
	-025-G25-AP16-02C(35/220)	△	25	25	220	35	15.5	2	0.658
	-030-G25-AP16-02C(35/115)	△	30	25	115	35	15.5	2	0.521
	-030-G25-AP16-02C(35/170)	△	30	25	170	35	15.5	2	0.632
	-030-G25-AP16-02C(35/220)	△	30	25	220	35	15.5	2	0.78
	-032-G32-AP16-03	▲	32	32	125	40	15.5	3	0.7
	-032-G32-AP16-03C(45/125)	△	32	32	125	45	15.5	3	0.607
	-032-G32-AP16-03C(45/190)	△	32	32	190	45	15.5	3	0.976
	-032-G32-AP16-03C(45/260)	△	32	32	260	45	15.5	3	1.374
	-040-G32-AP16-04	▲	40	32	130	42	15.5	4	0.8
	-040-G32-AP16-04C(45/125)	△	40	32	125	45	15.5	4	0.716
	-040-G32-AP16-04C(45/190)	△	40	32	190	45	15.5	4	1.085
	-040-G32-AP16-04C(45/260)	△	40	32	260	45	15.5	4	1.483
	-050-G32-AP16-05	▲	50	32	135	45	15.5	5	1.0
	-050-G32-AP16-05C(45/125)	△	50	32	125	45	15.5	5	0.825
	-050-G32-AP16-05C(45/190)	△	50	32	190	45	15.5	5	1.195
	-050-G32-AP16-05C(45/260)	△	50	32	260	45	15.5	5	1.592
	-063-G32-AP16-06	▲	63	32	135	45	15.5	6	1.4

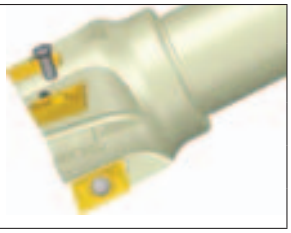
▲Stock available △Make-to-order

EMP01-010-G10-AP07-02C(25/85)

Effective cutting depth/Overall length

Spare parts

Diameter ØD	Inserts	Screw	Wrench	
				
Ø10-Ø16	AP07	I60M1.8×4	WT05IP	--
Ø12-Ø32	AP11	I60M2.5×6.5T	WT08IP	--
Ø25-Ø63	AP16	I60M4×8.4	--	WT15IS



Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Square shoulder milling tools

Kr:90°


Step shoulder

Slot milling

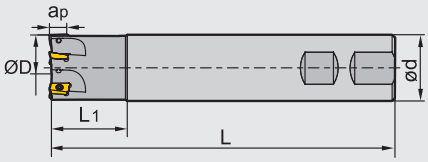
Ramp milling

Helical machining

Plunge milling

EMP01 P M K S N

Weldon shank



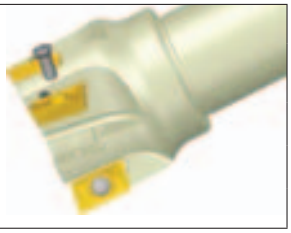
Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Weight (kg)
			ØD	ød	L	L_1	$a_p$max		
EMP01 Weldon shank	**-012-XP16-AP11-01**	▲	12	16	85	25	10.5	1	0.1
	-016-XP16-AP11-02	▲	16	16	90	25	10.5	2	0.1
	-020-XP20-AP11-02	▲	20	20	100	30	10.5	2	0.2
	-025-XP25-AP11-03	▲	25	25	115	35	10.5	3	0.4
	-032-XP32-AP11-04	▲	32	32	125	40	10.5	4	0.7
	-025-XP25-AP16-02	▲	25	25	115	35	15.5	2	0.4
	-032-XP32-AP16-03	▲	32	32	125	40	15.5	3	0.7
	-040-XP32-AP16-04	▲	40	32	130	42	15.5	4	0.8
	-050-XP32-AP16-05	▲	50	32	135	45	15.5	5	1.0
	-063-XP32-AP16-06	▲	63	32	135	45	15.5	6	1.4

▲Stock available △Make-to-order

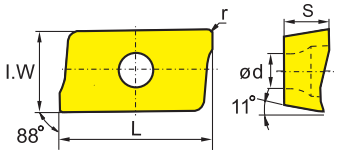
Spare parts

Diameter ØD	Inserts	Screw	Wrench	
				
Ø12-Ø32	AP11	I60M2.5×6.5T	WT08IP	--
Ø25-Ø63	AP16	I60M4×8.4	--	WT15IS



Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Selection of inserts



Good working condition Normal working condition Bad working condition

Workpiece material		
P	Steel	😃😃😃😃☹ 😃😃😊☹ 😊 😊😊☹
M	Stainless steel	😃😃😃😃☹ 😃😃😃☹ 😊 😊😊☹
K	Cast iron	😃☹😊 😃😊 😊☹
N	Non-ferrous metal	😃☹
S	Heat resistant alloy, Ti alloy	😊😃😃😃 😃☹

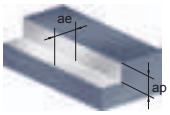
Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	I.W	S	ød	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	APKT070204-APF	7.32	4.34	2.38	2	0.4		●		●							★											
	APKT11T304-APF	12.24	6.6	3.6	2.8	0.4		●		●							★											
	APKT11T308-APF	12.24	6.6	3.6	2.8	0.8		●		●							★				●	●						
	APKT160408-APF	17.877	9.33	5.76	4.4	0.8		●									★				●	●						
	APKT070204-APM	7.32	4.34	2.38	2	0.4				●		●					★											
	APKT11T304-APM	12.24	6.6	3.6	2.8	0.4				●							★											
	APKT11T308-APM	12.24	6.6	3.6	2.8	0.8				●		●					★				●	●						
	APKT11T312-APM	12.24	6.6	3.6	2.8	1.2						●					★											
	APKT11T316-APM	12.24	6.6	3.6	2.8	1.6											★											
	APKT11T320-APM	12.24	6.6	3.6	2.8	2.0				●							★											
	APKT160408-APM	17.877	9.33	5.76	4.4	0.8				●		●					★				●	●						
	APKT160416-APM	17.877	9.33	5.76	4.4	1.6				●		●					★				●							
	APKT160420-APM	17.877	9.33	5.76	4.4	2.0						●					★											
	APKT160424-APM	17.877	9.33	5.76	4.4	2.4											★											
	APKT160430-APM	17.877	9.33	5.76	4.4	3.0											★											
	APKT11T304-ALH	12.24	6.6	3.6	2.8	0.4																				★	★
	APKT11T308-ALH	12.24	6.6	3.6	2.8	0.8																				★	○
	APKT160408-ALH	17.877	9.33	5.76	4.4	0.8																				★	★

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Chipbreaker selection

Classification \ Application	For finishing	For semi-finishing
P	-APF	-APM
M	-APF	-APM
S	-APF	-APM
K	-APF	-APM
N	-ALH	

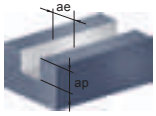
1 Square shoulder milling



Recommended cutting parameters (D: Diameter)

Workpiece material		Hardness HB	Insert grade	Cutting parameters			
				Vc(m/min)	fz(mm/z)		ae(mm)
					-APF	-APM	
P	Low-carbon steel、Soft steel	⩽180	YBC302	320 (240-400)	0.1 (0.08-0.2)	--	⩽0.5D
			YB9320	320 (200-400)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	
			YBM253	300 (320-350)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	
	High-carbon steel、Alloy steel	180-280	YBC302	280 (210-380)	0.1 (0.08-0.2)	--	⩽0.5D
			YB9320	280 (180-350)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	
			YBM253	260 (150-380)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	
	Alloy tool steel	280-350	YBC302	260 (180-350)	0.1 (0.08-0.2)	--	⩽0.5D
			YB9320	260 (160-330)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	
			YBM253	220 (150-280)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	
M	Stainless steel	⩽270	YB9320	200 (110-300)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	⩽0.5D
			YBM253	180 (150-300)			
K	Cast iron	180-250	YB9320	180 (150-250)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	⩽0.5D
			YBD152	200 (150-250)	--	0.2 (0.1-0.3)	
S	Difficult-to-machine materials	⩽400	YBS203	100 (60-120)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	⩽0.5D
			YBS303	100 (60-120)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	⩽0.5D
N					-ALH		
	Aluminium alloy	--	YD101	300-	0.2 (0.08-0.4)		⩽0.5D
			YD201	300-	0.2 (0.08-0.4)		⩽0.5D

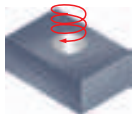
2 Slot milling



Recommended cutting parameters (D: Diameter)

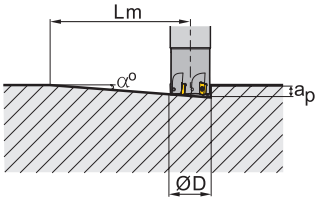
Workpiece material		Hardness HB	Insert grade	Cutting parameters			
				Vc(m/min)	fz(mm/z)		ae(mm)
					-APF	-APM	
P	Low-carbon steel、Soft steel	⩽180	YBC302	190 (170-250)	0.1 (0.08-0.15)	--	D
			YB9320	190 (140-250)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	
			YBM253	150 (130-210)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	
	High-carbon steel、Alloy steel	180-280	YBC302	170 (150-220)	0.1 (0.08-0.15)	--	D
			YB9320	170 (130-250)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	
			YBM253	140 (110-200)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	
	Alloy tool steel	280-350	YBC302	150 (130-210)	0.1 (0.08-0.15)	--	D
			YB9320	150 (110-240)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	
			YBM253	130 (110-180)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	
M	Stainless steel	⩽270	YB9320	120 (80-190)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	D
			YBM253	100 (80-170)			
K	Cast iron	180-250	YB9320	120 (80-180)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	D
			YBD152	120 (80-210)	--	0.15 (0.1-0.25)	
S	Difficult-to-machine materials	⩽400	YBS203	60 (45-110)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	D
			YBS303	60 (45-110)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	D
N					-ALH		
	Aluminium alloy	--	YD101	300-	0.2 (0.08-0.3)		D
			YD201	300-	0.2 (0.08-0.3)		D

3 Ramp milling, helical interpolation milling



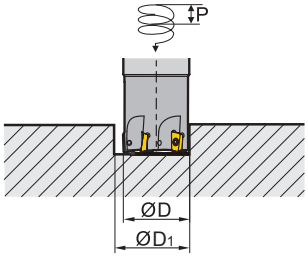

Recommended cutting parameters (D: Diameter)

● Ramp milling



$$Lm=\frac{a_p}{tg\alpha}$$ (α:Maximum ramp angle)

● Helical interpolation milling



$$tg\alpha=\frac{P}{\pi D_1}$$ (α:Helical angle)

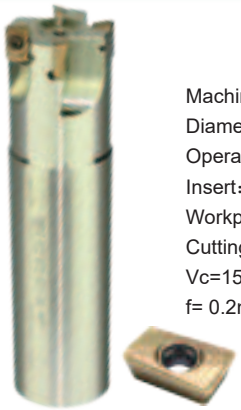
Diameter ØD(mm)	APKT Ramp milling, helical interpolation milling (Inserts-7)				
	Ramp milling			Helical interpolation milling	
	Maximum cutting depth	Maximum ramp angle	Minimum length	Minimum diameter	Maximum pitch
	a_p(mm)	α°	Lm(mm)	$ØD_1$(mm)	(mm)
10	6	6	57	12	2.0
12	6	4	85	15	2.0
14	6	3	114	18	2.0
16	6	2.5	137	21	2.0

Diameter ØD(mm)	APKT Ramp milling, helical interpolation milling (Inserts-11)				
	Ramp milling			Helical interpolation milling	
	Maximum cutting depth	Maximum ramp angle	Minimum length	Minimum diameter	Maximum pitch
	a_p(mm)	α°	Lm(mm)	$ØD_1$(mm)	(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
30	10.0	3.5	153.0	48.0	2.0
32	10.0	3.0	190.8	56.0	2.0
40	10.0	2.0	286.4	70.0	2.0

Diameter ØD(mm)	APKT Ramp milling, helical interpolation milling (Inserts-16)				
	Ramp milling			Helical interpolation milling	
	Maximum cutting depth	Maximum ramp angle	Minimum length	Minimum diameter	Maximum pitch
	a_p(mm)	α°	Lm(mm)	$ØD_1$(mm)	(mm)
25	15	6	142	32	2.0
30	15	5	171	40	2.0
32	15	4.5	214	45	2.0
40	15	2.5	343	60	2.0
50	15	1.5	572	80	2.0
63	15	1	859	105	2.0

Note: For cutting speed and feed rate per tooth, see square shoulder milling.

Case for EMP01



Machine: Vertical machining center
Diameter：Ø40mm
Operation：Interpolation milling
Insert：APKT160408-APM/YB9320
Workpiece material：P20(HRC 33-36)
Cutting data：
Vc=150m/min
f= 0.2mm/z

Insert specification/grade：APKT160408-APM/YB9320

Tools specification：EMP01-040-XP32-AP16-04

●Comprehensively improve mould cavity machining efficiency

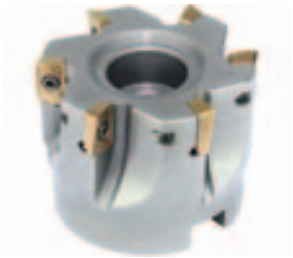
Optimized structure in combination with brand-new "golden drill" coating technique, ZCC·CT products with APM chipbreaker is more suitable for mold cavity machining, greatly improve machining efficiency when compare with competitors similar products.

Square shoulder milling tools Kr:90°

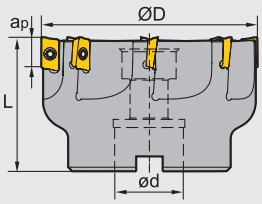

Face milling


Step shoulder

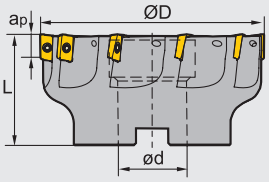
EMP02 P M K S N



A-type coupling



B-type coupling



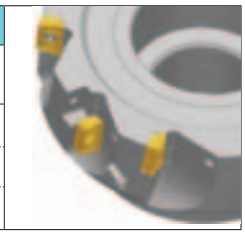
Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth Z	Type of coupling	Weight (kg)
			ØD	ød	L	apmax			
EMP02	-050-A22-AP11-06	▲	50	22	40	10.5	6	A	0.3
	-063-A22-AP11-08	▲	63	22	40	10.5	8	A	0.6
	-080-A27-AP11-08	▲	80	27	50	10.5	8	A	1.2
	-100-B32-AP11-10	▲	100	32	50	10.5	10	B	1.7
	-050-A22-AP16-05	▲	50	22	40	15.5	5	A	0.3
	-063-A22-AP16-06	▲	63	22	40	15.5	6	A	0.5
	-080-A27-AP16-07	▲	80	27	50	15.5	7	A	1.1
	-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

▲Stock available △Make-to-order

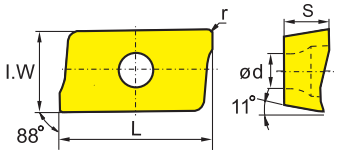
Spare parts

Diameter ØD	Inserts	Screw	Wrench
			
Ø50-Ø100	AP11	I60M2.5×6.5T	WT08IS
Ø50-Ø160	AP16	I60M4×10	WT15IS



Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Selection of inserts



Good working condition Normal working condition Bad working condition

Workpiece material	
P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

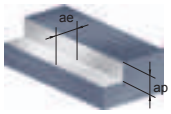
Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	I.W	S	ød	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**APKT11T304-APF**	12.24	6.6	3.6	2.8	0.4		●		●							★											
	APKT11T308-APF	12.24	6.6	3.6	2.8	0.8		●		●							★				●	●						
	APKT160408-APF	17.877	9.33	5.76	4.4	0.8		●									★				●	●						
	**APKT11T304-APM**	12.24	6.6	3.6	2.8	0.4				●							★											
	APKT11T308-APM	12.24	6.6	3.6	2.8	0.8				●		●					★				●	●						
	APKT11T312-APM	12.24	6.6	3.6	2.8	1.2						●					★											
	APKT11T316-APM	12.24	6.6	3.6	2.8	1.6											★											
	APKT11T320-APM	12.24	6.6	3.6	2.8	2.0				●							★											
	APKT160408-APM	17.877	9.33	5.76	4.4	0.8				●		●					★				●	●						
	APKT160416-APM	17.877	9.33	5.76	4.4	1.6				●		●					★				●							
	APKT160420-APM	17.877	9.33	5.76	4.4	2.0						●					★											
	APKT160424-APM	17.877	9.33	5.76	4.4	2.4											★											
	APKT160430-APM	17.877	9.33	5.76	4.4	3.0											★											
	**APKT11T304-ALH**	12.24	6.6	3.6	2.8	0.4																				★	★
	APKT11T308-ALH	12.24	6.6	3.6	2.8	0.8																				★	○
	APKT160408-ALH	17.877	9.33	5.76	4.4	0.8																				★	★

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Chipbreaker selection

Classification \ Function	For finishing	For semi-finishing
P	-APF	-APM
M	-APF	-APM
S	-APF	-APM
K	-APF	-APM
N	-ALH	

1 Square shoulder milling



Recommended cutting parameters (D: Diameter)

Workpiece material		Hardness HB	Insert grade	Cutting parameters			
				Vc(m/min)	fz(mm/z)		a_e(mm)
					-APF	-APM	
P	Low-carbon steel、Soft steel	⩽180	YBC302	320 (240-400)	0.1 (0.08-0.2)	--	⩽0.5D
			YB9320	320 (200-400)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	
			YBM253	300 (320-350)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	
	High-carbon steel、Alloy steel	180-280	YBC302	280 (210-380)	0.1 (0.08-0.2)	--	⩽0.5D
			YB9320	280 (180-350)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	
			YBM253	260 (150-380)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	
	Alloy tool steel	280-350	YBC302	260 (180-350)	0.1 (0.08-0.2)	--	⩽0.5D
			YB9320	260 (160-330)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	
			YBM253	220 (150-280)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	
M	Stainless stee	⩽270	YB9320	200 (110-300)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	⩽0.5D
			YBM253	180 (150-300)			
K	Cast iron	180-250	YB9320	180 (150-250)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	⩽0.5D
			YBD152	200 (150-250)	--	0.2 (0.1-0.3)	
S	Difficult-to-machine materials	⩽400	YBS203	100 (60-120)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	⩽0.5D
			YBS303	100 (60-120)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	⩽0.5D
N					-ALH		
	Aluminium alloy	--	YD101	300-	0.2 (0.08-0.4)		⩽0.5D
			YD201	300-	0.2 (0.08-0.4)		⩽0.5D

Square shoulder milling tools

Kr:90°


Step shoulder

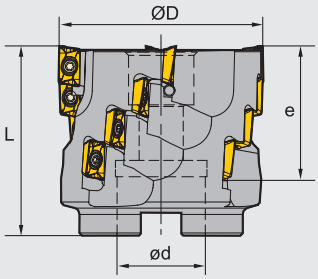

Slot milling


Face milling

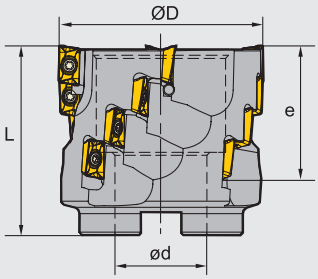

Side milling

EMP03 P M K S N

A-type coupling



B-type coupling



Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth z	Number of inserts	Type of coupling	Weight (kg)
			ØD	ød	L	e				
EMP03	**-050-A22-AP11-04**	▲	50	22	58	39	4	16	A	0.5
	-063-A27-AP11-04	▲	63	27	58	39	4	16	A	0.9
	-080-B32-AP11-05	▲	80	32	63	39	5	20	B	1.3
	-100-B40-AP11-06	▲	100	40	63	39	6	24	B	2.0

▲Stock available △Make-to-order

Spare parts

Diameter ØD	Screw	Wrench	
			
Ø50-Ø100	I60M2.5×6.5T	WT08IS	

Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Square shoulder milling tools Kr:90°

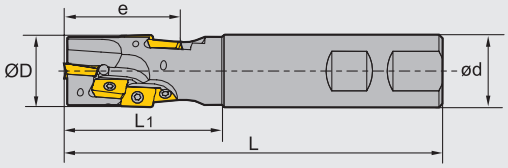

Step shoulder


Slot milling


Side milling

EMP04 P M K S N

Weldon shank



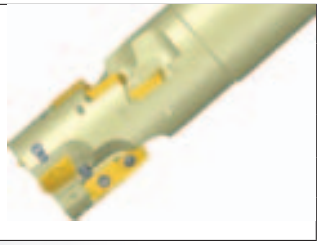
Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth z	Number of inserts	Weight (kg)
			ØD	ød	L	L_1	e			
EMP04	-020-XP20-AP11-01	▲	20	20	120	45	29.4	1	3	0.3
	-025-XP25-AP11-02	▲	25	25	130	55	38.9	2	8	0.4
	-032-XP32-AP11-02	▲	32	32	140	65	48.5	2	10	0.7
	-040-XP40-AP11-02	▲	40	40	150	75	58.0	2	14	1.3

▲Stock available △Make-to-order

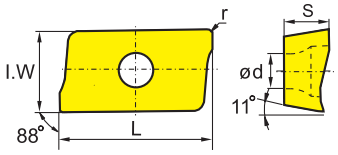
Spare parts

Diameter ØD	Screw	Wrench
		
Ø20-Ø40	I60M2.5×6.5T	WT08IS



Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Selection of inserts



Good working condition 😊 Normal working condition 😐 Bad working condition

Workpiece material		
P	Steel	😐 😐 😐 😐 ☹ 😐 😐 😊 ☹ 😊 😊 😊 ☹
M	Stainless steel	😐 😐 😐 😐 ☹ 😐 😐 😐 ☹ 😊 😊 😊 ☹
K	Cast iron	😐 ☹ 😊 😐 😊 ☹ 😊
N	Non-ferrous metal	😐 ☹
S	Heat resistant alloy, Ti alloy	😊 😐 😐 😐 😐 ☹

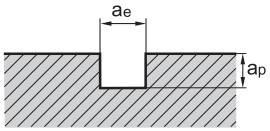
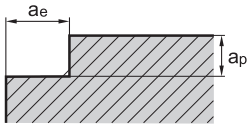
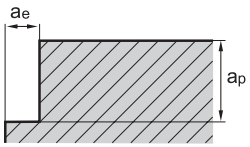
Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	I.W	S	ød	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**APKT11T304-APF**	12.24	6.6	3.6	2.8	0.4		●		●							★											
	APKT11T308-APF	12.24	6.6	3.6	2.8	0.8		●		●							★				●	●						
	**APKT11T304-APM**	12.24	6.6	3.6	2.8	0.4				●							★											
	APKT11T308-APM	12.24	6.6	3.6	2.8	0.8				●		●					★				●	●						
	APKT11T312-APM	12.24	6.6	3.6	2.8	1.2						●					★											
	APKT11T316-APM	12.24	6.6	3.6	2.8	1.6											★											
	APKT11T320-APM	12.24	6.6	3.6	2.8	2.0				●							★											
	**APKT11T304-ALH**	12.24	6.6	3.6	2.8	0.4																				★	★
	APKT11T308-ALH	12.24	6.6	3.6	2.8	0.8																				★	○

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Chipbreaker selection

Classification \ Application	For finishing	For semi-finishing
P	-APF	-APM
M	-APF	-APM
S	-APF	-APM
K	-APF	-APM
N	-ALH	

Recommended cutting parameters

Slot milling	Square shoulder milling	Deep square shoulder milling
		
a_e=D，a_p≤0.5D	a_e≤0.5D，a_p≤1.2D	a_e≤0.2D，a_p＜Cutting length of insert

Workpiece material		Hardness HB	Insert grade	Cutting parameters		
				Square shoulder milling		
				Vc(m/min)	fz(mm/z)	
					-APF	-APM
P	Low-carbon steel、Soft steel	≤180	YBC302	270 (240-350)	0.1 (0.08-0.2)	--
			YB9320	220 (200-360)	0.1 (0.08-0.2)	0.2 (0.1-0.3)
			YBM253	270 (180-300)	0.1 (0.08-0.2)	0.2 (0.1-0.3)
	High-carbon steel、Alloy steel	180-280	YBC302	240 (210-320)	0.1 (0.08-0.2)	--
			YB9320	240 (180-360)	0.1 (0.08-0.2)	0.2 (0.1-0.3)
			YBM253	200 (160-280)	0.1 (0.08-0.2)	0.2 (0.1-0.3)
	Alloy tool steel	280-350	YBC302	220 (180-300)	0.1 (0.08-0.2)	--
			YB9320	220 (160-340)	0.1 (0.08-0.2)	0.2 (0.1-0.3)
			YBM253	180 (150-250)	0.1 (0.08-0.2)	0.2 (0.1-0.3)
M	Stainless steel	≤270	YB9320	150 (110-270)	0.1 (0.08-0.2)	0.2 (0.1-0.3)
			YBM253	140 (100-250)		
K	Cast iron	180-250	YB9320	150 (100-200)	0.1 (0.08-0.2)	0.2 (0.1-0.3)
			YBD152	180 (120-300)	--	0.2 (0.1-0.3)
S	Difficult-to-machine materials	≤400	YBS203	100 (60-120)	0.1 (0.08-0.2)	0.2 (0.1-0.3)
			YBS303	100 (60-120)	0.1 (0.08-0.2)	0.2 (0.1-0.3)
N					-ALH	
	Aluminium alloy	--	YD101	300-	0.2 (0.08-0.4)	
			YD201	300-	0.2 (0.08-0.4)	

Workpiece material		Hardness HB	Insert grade	Cutting parameters		
				Slot milling、Deep square shoulder milling		
				Vc(m/min)	fz(mm/z)	
					-APF	-APM
P	Low-carbon steel、Soft steel	≤180	YBC302	270 (240-350)	0.1 (0.08-0.15)	--
			YB9320	270 (200-360)	0.1 (0.08-0.15)	0.15 (0.1-0.25)
			YBM253	220 (180-300)	0.1 (0.08-0.15)	0.15 (0.1-0.25)
	High-carbon steel、Alloy steel	180-280	YBC302	240 (210-320)	0.1 (0.08-0.15)	--
			YB9320	240 (180-360)	0.1 (0.08-0.15)	0.15 (0.1-0.25)
			YBM253	200 (160-280)	0.1 (0.08-0.15)	0.15 (0.1-0.25)
	Alloy tool steel	280-350	YBC302	220 (180-300)	0.1 (0.08-0.15)	--
			YB9320	220 (160-340)	0.1 (0.08-0.15)	0.15 (0.1-0.25)
			YBM253	180 (150-250)	0.1 (0.08-0.15)	0.15 (0.1-0.25)
M	Stainless steel	≤270	YB9320	150 (110-270)	0.1 (0.08-0.15)	0.15 (0.1-0.25)
			YBM253	140 (100-250)		
K	Cast iron	180-250	YB9320	150 (100-200)	0.1 (0.08-0.15)	0.15 (0.1-0.25)
			YBD152	180 (120-300)	--	0.15 (0.1-0.25)
S	Difficult-to-machine materials	≤400	YBS203	60 (45-110)	0.1 (0.08-0.15)	0.15 (0.1-0.25)
			YBS303	60 (45-110)	0.1 (0.08-0.15)	0.15 (0.1-0.25)
N					-ALH	
	Aluminium alloy	--	YD101	300-	0.2 (0.08-0.3)	
			YD201	300-	0.2 (0.08-0.3)	

- 4 available cutting edges and precise 90°square shoulder.
- Double rake angle can effectively reduce cutting force.
- High precision of cutting tool can achieve high quality and efficient roughing.
- The Tangential assembling can change the cutting force of main direction to be borne by the thickness direction to realize the high rigidity of the cutting tool.
- The optimized material of cutter body with high strength and special coating treatment achieves better wear-resistance and longer tool life.

Kr:90°

A New Generation of Tangential Milling Cutter EMP09 Series

To meet the diverse processing needs and achieve efficient rough machining.

- High strength of tool nose, sharp cutting and good wear resistance.
- The spiral cutting edge stands for a lighter chipbreaker.
- Excellent universal coating materials, super smooth coating technology, no sticky chip and longer life.
- The vertical design makes the carbide has large volume along the direction of the cutting force, so that the feed per tooth is 30% higher than the flat load insert.

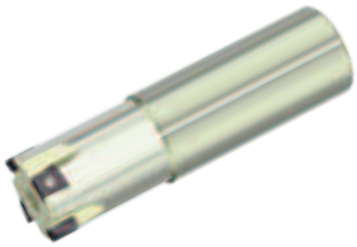
Square shoulder milling tools Kr:90°


Face milling

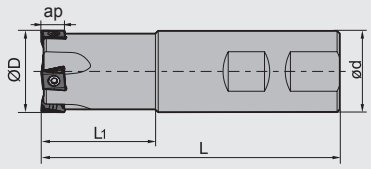
Step shoulder

Slot milling

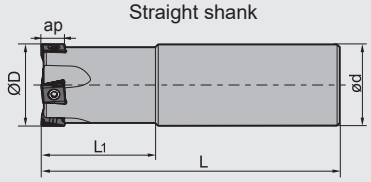
EMP09 P M K S



Weldon shank



Straight shank



Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth z	Weight (kg)
			ØD	ød	L	L_1	apmax		
EMP09 Weldon shank	**-020-XP20-LN08-02C**	▲	20	20	100	25	8.0	2	0.20
	-020-XP20-LN08-03C	▲	20	32	100	25	8.0	3	0.20
	-025-XP25-LN08-03C	▲	25	25	100	32	8.0	3	0.36
	-025-XP25-LN08-04C	▲	25	25	100	32	8.0	4	0.35
	-032-XP32-LN08-04C	▲	32	32	115	40	8.0	4	0.67
	-032-XP32-LN08-05C	▲	32	32	115	40	8.0	5	0.67
	-040-XP40-LN08-05C	▲	40	40	125	40	8.0	5	1.15
	-040-XP40-LN08-06C	▲	40	40	125	40	8.0	6	1.14
	-040-XP40-LN12-03C	▲	40	40	125	40	11.5	3	1.11
	-040-XP40-LN12-04C	▲	40	40	125	40	11.5	4	1.10
Straight shank	**-020-G20-LN08-02C**	▲	20	20	100	25	8.0	2	0.2
	-020-G20-LN08-03C	▲	20	20	100	25	8.0	3	0.2
	-025-G25-LN08-03C	▲	25	25	100	32	8.0	3	0.36
	-025-G25-LN08-04C	▲	25	25	100	32	8.0	4	0.35
	-032-G32-LN08-04C	▲	32	32	115	40	8.0	4	0.67
	-032-G32-LN08-05C	▲	32	32	115	40	8.0	5	0.67
	-040-G40-LN12-03C	▲	40	40	125	40	11.5	3	1.11
	-040-G40-LN12-04C	▲	40	40	125	40	11.5	4	1.10

▲Stock available △Make-to-order

Spare parts

Diameter ØD	Inserts	Screw	Wrench
			
Ø20~Ø40	LN□T0804□□-GM/GL	I60M3×7	WT09IS
Ø32~Ø40	LN□T1206□□-GM/GL	I60M4×12	WT15IS

Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

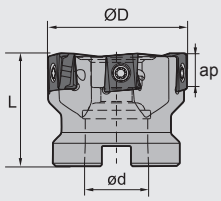
Square shoulder milling tools Kr:90°


Face milling

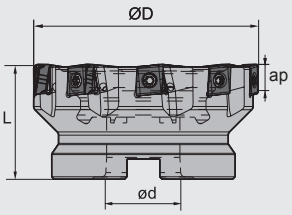

Step shoulder

EMP09 P M K S

A-type coupling



B-type coupling



Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth z	Type of coupling	Weight (kg)
			ØD	ød	L	apmax			
EMP09	-040-A16-LN08-05C	▲	40	16	40	8	5	A	0.21
	-040-A16-LN08-06C	▲	40	16	40	8	6	A	0.21
	-050-A22-LN08-06C	▲	50	22	40	8	6	A	0.35
	-050-A22-LN08-07C	▲	50	22	40	8	7	A	0.35
	-063-A22-LN08-08C	▲	63	22	40	8	8	A	0.60
	-063-A22-LN08-10C	▲	63	22	40	8	10	A	0.60
	-080-A27-LN08-10C	▲	80	27	50	8	10	A	1.26
	-080-A27-LN08-12C	▲	80	27	50	8	12	A	1.26
	-040-A16-LN12-03C	▲	40	16	40	11.5	3	A	0.20
	-040-A16-LN12-04C	▲	40	16	40	11.5	4	A	0.19
	-050-A22-LN12-05C	▲	50	22	40	11.5	5	A	0.30
	-050-A22-LN12-06C	▲	50	22	40	11.5	6	A	0.30
	-063-A22-LN12-06C	▲	63	22	40	11.5	6	A	0.54
	-063-A22-LN12-08C	▲	63	22	40	11.5	8	A	0.54
	-080-A27-LN12-07C	▲	80	27	50	11.5	7	A	1.18
	-080-A27-LN12-10C	▲	80	27	50	11.5	10	A	1.18
	-100-B32-LN12-09C	▲	100	32	50	11.5	9	B	1.64
	-100-B32-LN12-13C	▲	100	32	50	11.5	13	B	1.64
	-125-B40-LN12-11C	▲	125	40	63	11.5	11	B	2.74
	-125-B40-LN12-16C	▲	125	40	63	11.5	16	B	2.74

▲Stock available △Make-to-order

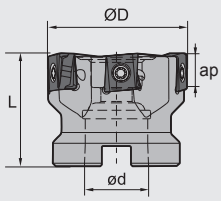
Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Square shoulder milling tools Kr:90°

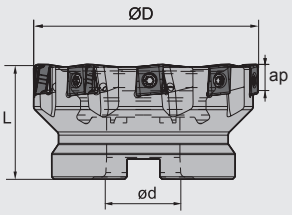
Face milling Step shoulder

EMP09 P M K S

A-type coupling



B-type coupling



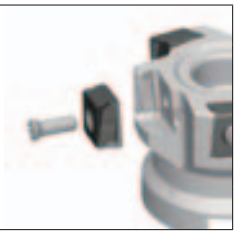
Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth z	Type of coupling	Weight (kg)
			ØD	ød	L	apmax			
EMP09	-050-A22-LN16-04C	▲	50	22	40	15	4	A	0.31
	-050-A22-LN16-05C	▲	50	22	40	15	5	A	0.31
	-063-A22-LN16-05C	▲	63	22	40	15	5	A	0.56
	-063-A22-LN16-06C	▲	63	22	40	15	6	A	0.56
	-080-A27-LN16-06C	▲	80	27	50	15	6	A	1.20
	-080-A27-LN16-07C	▲	80	27	50	15	7	A	1.20
	-100-B32-LN16-08C	▲	100	32	50	15	8	B	1.62
	-100-B32-LN16-10C	▲	100	32	50	15	10	B	1.62
	-125-B40-LN16-10C	▲	125	40	63	15	10	B	3.27
	-125-B40-LN16-13C	▲	125	40	63	15	13	B	3.27
	-160-B40-LN16-12C	▲	160	40	63	15	12	B	6.37
	-160-B40-LN16-16C	▲	160	40	63	15	16	B	6.37

▲Stock available △Make-to-order

Spare parts

Diameter ØD	Inserts	Screw	Wrench
			
Ø40~Ø80	LN□T0804□□-GM/GL	I60M3×7	WT09IS
Ø40~Ø125	LN□T1206□□-GM/GL	I60M4×12	WT15IS
Ø50~Ø160	LN□T1607□□-GM/GL	I60M5×13	WT20IS



Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Square shoulder milling tools

Kr:90°

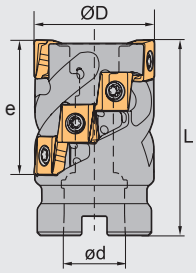

Step shoulder


Slot milling


Face milling


Side milling

EMP09 P M K S

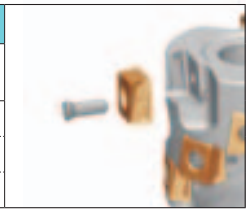


Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth Z	Number of inserts	Weight (kg)
			ØD	ød	L	e			
EMP09	-032×38-A16-LN08-03C	▲	32	16	55	38	3	15	0.15
	-040×38-A16-LN08-04C	▲	40	16	55	38	4	20	0.3
	-040×45-A16-LN08-04C	▲	40	16	65	45	4	24	0.4
	-050×38-A22-LN08-05C	▲	50	22	55	38	5	25	0.5
	-050×45-A22-LN08-05C	▲	50	22	65	45	5	30	0.6
	-040×33-A16-LN12-02C	▲	40	16	55	33	2	6	0.3
	-040×43-A16-LN12-02C	▲	40	16	65	43	2	8	0.34
	-050×33-A16-LN12-03C	▲	50	16	55	33	3	9	0.5
	-050×43-A22-LN12-03C	▲	50	22	70	43	3	12	0.62
	-063×43-A27-LN12-04C	▲	63	27	70	43	4	16	1.03
	-063×53-A27-LN12-04C	▲	63	27	80	53	4	20	1.2
	-080×43-A27-LN12-05C	▲	80	27	70	43	5	20	1.91
	-080×53-A27-LN12-05C	▲	80	27	80	53	5	25	2.1
	-100×63-A27-LN12-06C	▲	100	27	90	63	6	36	3.3

▲Stock available △Make-to-order

Spare parts

Diameter ØD	Inserts	Screw	Wrench	
				
Ø32×38-Ø50×45	LN□T0804□□-GM/GL	I60M3×7	WT09IP	
Ø40×33-Ø63×53	LN□T1206□□-GM/GL	I60M4×12	WT15IP	
Ø80×43-Ø100×63			WT15IS	

Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

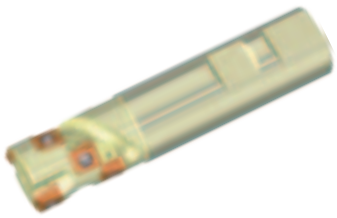
Square shoulder milling tools Kr:90°

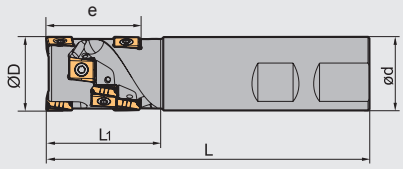

Step shoulder


Slot milling


Side milling

EMP09 P M K S





Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Number of inserts	Weight (kg)
			ØD	ød	L	L_1	e			
EMP09	-025×30-XP25-LN08-02C	▲	25	25	100	40	30	2	8	0.31
	-032×38-XP32-LN08-03C	▲	32	32	115	45	38	3	15	0.62
	-040×45-XP32-LN08-04C	▲	40	32	120	55	45	4	24	0.7
	-040×33-XP32-LN12-02C	▲	40	32	115	45	33	2	6	0.7
	-040×43-XP32-LN12-02C	▲	40	32	125	55	43	2	8	0.7
	-050×43-XP40-LN12-03C	▲	50	40	135	55	43	3	12	1.4
	-050×53-XP40-LN12-03C	▲	50	40	145	65	53	3	15	1.5

▲Stock available △Make-to-order

Spare parts

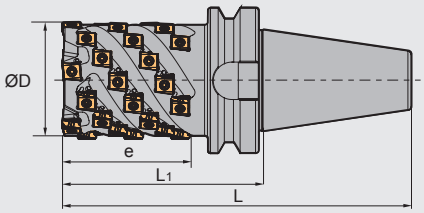
Diameter ØD	Inserts	Screw	Wrench	
				
Ø25×30-Ø32×38	LN□T0804□□-GM/GL	I60M3×7	WT09IS	
Ø40×33-Ø50×53	LN□T1206□□-GM/GL	I60M4×12	WT15IP	

Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Square shoulder milling tools

Kr:90°

EMP09 P M K S

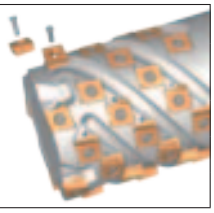


Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth Z	Shank type	Number of inserts	Weight (kg)
			ØD	e	L_1	L				
EMP09	-050×63-BT50-LN12-03C	△	50	63	124	225.8	3	BT	18	4.34
	-050×85-BT50-LN12-03C	△	50	85	146	246.8	3	BT	24	4.57
	-050×103-BT50-LN12-03C	△	50	103	164	265.8	3	BT	30	4.89
	-063×85-BT50-LN12-04C	△	63	85	146	246.8	4	BT	32	5.35
	-063×115-BT50-LN12-04C	△	63	115	176	277.8	4	BT	44	6.07
	-080×125-BT50-LN12-05C	△	80	125	186	287.8	5	BT	60	8.25

▲Stock available △Make-to-order

Spare parts

Diameter ØD	Inserts	Screw	Wrench	
				
Ø50×63-Ø63×115	LN□T1206□□-GM/GL	I60M4×12	WT15IP	
Ø80×125			WT15IS	

Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

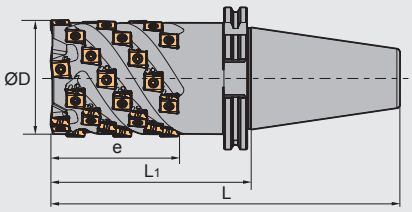
Square shoulder milling tools Kr:90°


Step shoulder


Slot milling


Side milling

EMP09 P M K S

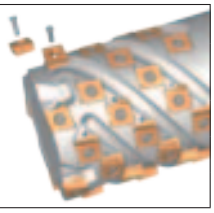


Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth Z	Shank type	Number of inserts	Weight (kg)
			ØD	e	L_1	L				
EMP09	-050×103-JT50-LN12-03C	△	50	103	164	265.75	3	JT	30	5.11
	-063×85-JT50-LN12-04C	△	63	85	146	246.75	4	JT	32	4.34
	-063×115-JT50-LN12-04C	△	63	115	176	277.75	4	JT	44	5.46
	-080×125-JT50-LN12-05C	△	80	125	186	287.75	5	JT	60	7.82

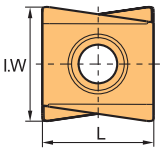
▲Stock available △Make-to-order

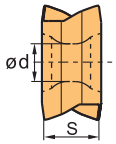
Spare parts

Diameter ØD	Inserts	Screw	Wrench	
				
Ø50×63-Ø63×115	LN□T1206□□-GM/GL	I60M4×12	WT15IP	
Ø80×125			WT15IS	

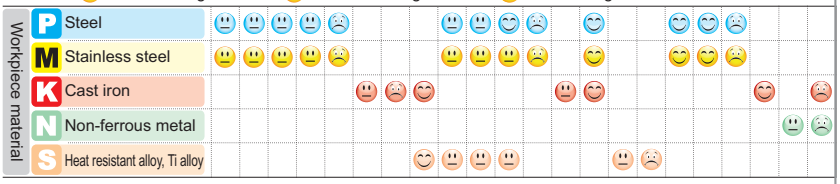
Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Selection of inserts





Good working condition Normal working condition Bad working condition



Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	l.W	S	ød	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**LNKT080404PNR-GM**	8.75	8.5	4.45	3.4	0.4				★		●	●				★					●						
	LNKT080408PNR-GM	8.75	8.5	4.45	3.4	0.8				★		●	●				★											
	LNKT080412PNR-GM	8.75	8.5	4.45	3.4	1.2				★		●	●				★											
	LNKT120608PNR-GM	12.7	13	6.75	4.4	0.8				★		●	●				★					●						
	LNKT120612PNR-GM	12.7	13	6.75	4.4	1.2				★		●	●				★											
	LNKT120616PNR-GM	12.7	13	6.75	4.4	1.6				★		●	●				★											
	LNKT120620PNR-GM	12.7	13	6.75	4.4	2.0				★		●	●				★											
	LNKT120624PNR-GM	12.7	13	6.75	4.4	2.4				★		●	●				★											
	LNKT120632PNR-GM	12.7	13	6.75	4.4	3.2				★		●	●				★											
	LNKT160708PNR-GM	16.05	15	7.35	5.5	0.8				★		●	●				★					●						
	LNKT160712PNR-GM	16.05	15	7.35	5.5	1.2				★		●	●				★											
	LNKT160716PNR-GM	16.05	15	7.35	5.5	1.6				★		●	●				★											
	**LNKT080404PNR-GL**	8.75	8.5	4.45	3.4	0.4				★		●	●				★					●						
	LNKT120608PNR-GL	12.7	13	6.75	4.4	0.8				★		●	●				★					●						
	LNKT160708PNR-GL	16.05	15	7.35	5.5	0.8				★		●	●				★					●						
	**LNMT080404PNR-GM**	8.75	8.5	4.45	3.4	0.4				★		●	●				★											
	LNMT120608PNR-GM	12.7	13	6.75	4.4	0.8				★		●	●				★											
	LNMT160708PNR-GM	16.05	15	7.35	5.5	0.8				★		●	●				★											

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

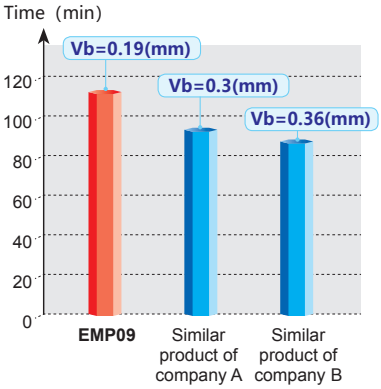
Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				Vc(m/min)	fz(mm/z)
P	Low-carbon steel、Soft steel	≤180	YBM253	260 (160-300)	0.3 (0.1-0.35)
			YB9320	260 (160-300)	0.3 (0.1-0.35)
	High-carbon steel、Alloy steel	180-280	YBM253	240 (160-240)	0.25 (0.1-0.35)
			YB9320	240 (160-240)	0.25 (0.1-0.35)
	Alloy tool steel	280-350	YBM253	200 (120-240)	0.2 (0.1-0.35)
			YB9320	200 (120-240)	0.2 (0.1-0.35)
M	Stainless stee	≤270	YBM253	180 (100-230)	0.15 (0.1-0.3)
			YB9320	160 (100-230)	0.15 (0.1-0.3)
K	Cast iron	180-250	YBD152 YBD252	220 (140-250)	0.2 (0.1-0.3)
				220 (140-250)	0.2 (0.1-0.3)
				220 (140-250)	0.2 (0.1-0.3)
S	Difficult-to-machine materials	≤400	YBS303	100 (60-120)	0.15 (0.1-0.25)

Case for EMP09

●Ultra-long working life

The material of workpiece：45#
Hardness：175-190（HB）
Machine tool：Planer-type milling machine
Type of cooling：No cooling
The machining type：Shoulder milling
Toolholder：EMP09-050-A22-LN12-05C
Insert：LNKT120608PNR-GM/YB9320
Cutting parameter：Vc=260m/min，Ap=8mm， Ae=2mm，fz=0.2mm/z

Comparison of tool life



Result:The processing life of LNKT12 (YB9320) is approximately 1.3 times of the similar product of company A and 1.4 times of the similar product of company B, with excellent wear resistance and longer tool life.

●Better surface quality

The material of workpiece：NAK80
Hardness：HRC(33−37)
Machine tool：Planer−type milling machine
Type of cooling：No cooling
The machining type：Shoulder milling
Toolholder：EMP09−050−A22−LN12−05C
Insert：LNKT120608PNR−GM (YB9320)
Similar product of company A
Cutting parameter：Vc=240m/min，Ap=8mm
Ae=2mm，fz=0.2mm/z

EMP09

No obvious gear mark

Similar product of company A

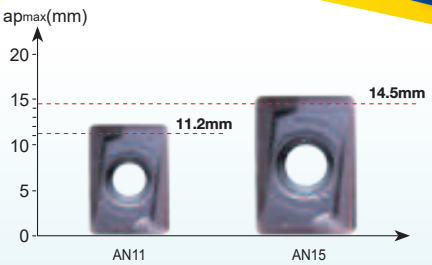
Slight step

Result: EMP09 series of tangential milling cutter has higher precision and better surface quality, no obvious gear mark, and runout value, which is better than the similar product of company A.

Kr:90°

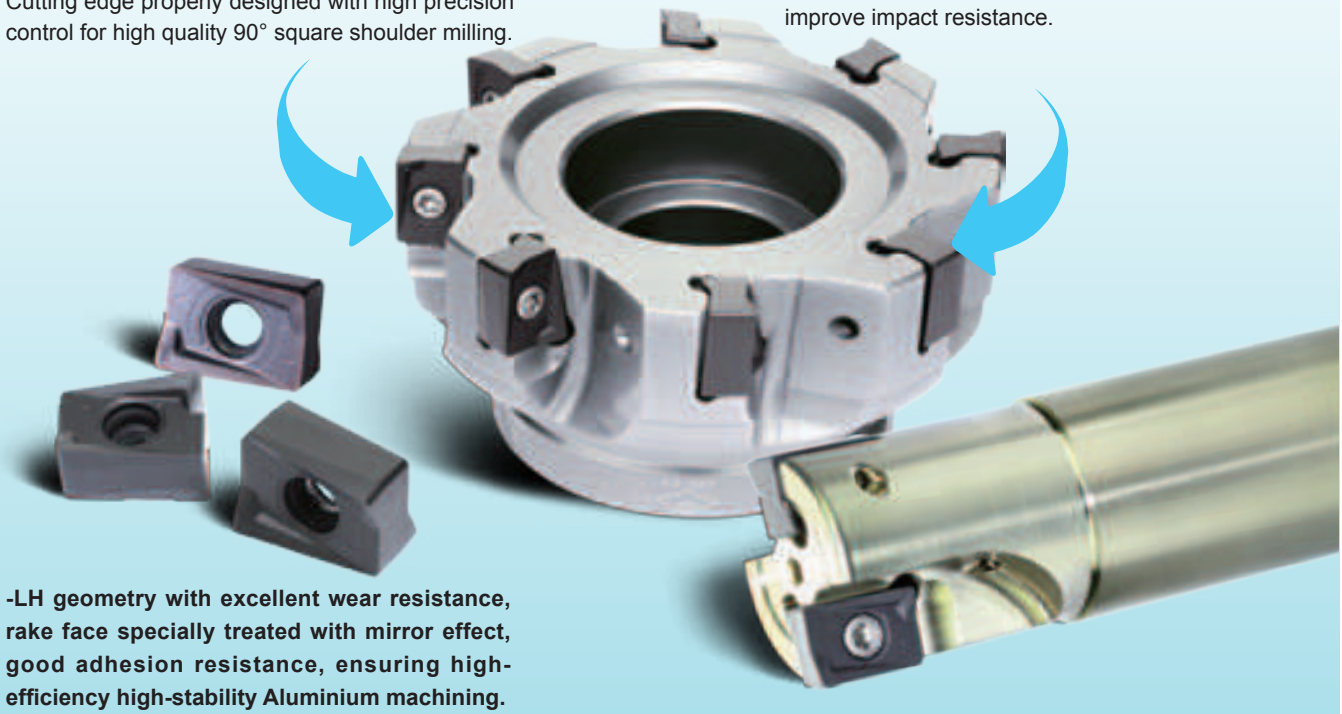
Achieving high quality 90° square shoulding milling

EMP13 Series Square Shoulder Milling Tools



Cutting edge properly designed with high precision control for high quality 90° square shoulder milling.

Extra thick insert with double negative cutter can achieve double positive cutting angle, reduce cutting force and greatly improve impact resistance.



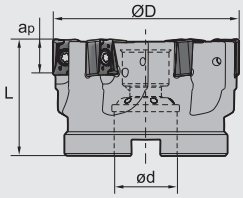
-LH geometry with excellent wear resistance, rake face specially treated with mirror effect, good adhesion resistance, ensuring high-efficiency high-stability Aluminium machining.

Square shoulder milling tools Kr:90°

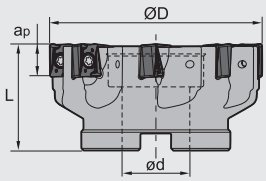
Face milling Step shoulder

EMP13 P M K N S

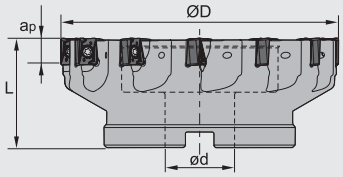
A-type coupling



B-type coupling



C-type coupling



Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth Z	Type of coupling	Weight (kg)
			ØD	ød	L	apmax			
EMP13	-050-A22-AN11-06C	▲	50	22	40	11.2	6	A	0.30
	-063-A22-AN11-07C	▲	63	22	40	11.2	7	A	0.49
	-080-A27-AN11-09C	▲	80	27	50	11.2	9	A	1.18
	-100-B32-AN11-12	▲	100	32	50	11.2	12	B	1.46
	-125-B40-AN11-14	▲	125	40	63	11.2	14	B	2.92
	-160-C40-AN11-16	▲	160	40	63	11.2	16	C	4.30
	-050-A22-AN15-04C	▲	50	22	40	14.5	4	A	0.26
	-063-A22-AN15-05C	▲	63	22	40	14.5	5	A	0.53
	-080-A27-AN15-06C	▲	80	27	50	14.5	6	A	1.23
	-100-B32-AN15-08	▲	100	32	50	14.5	8	B	1.52
	-125-B40-AN15-10	▲	125	40	63	14.5	10	B	3.05
	-160-C40-AN15-12	▲	160	40	63	14.5	12	C	4.46

▲Stock available △Make-to-order

Spare parts

Diameter ØD	Inserts	Screw	Wrench
			
Ø50-Ø160	AN□X11□□□□-GM/LH	I60M3X9	WT09IS
Ø50-Ø160	AN□X15□□□□-GM/LH	I60M4X12	WT15IS

Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Square shoulder milling tools Kr:90°


Face milling


Step shoulder

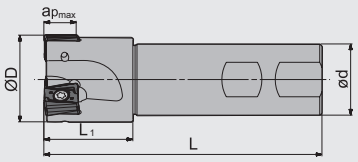

Slot milling

EMP13 P M K N S

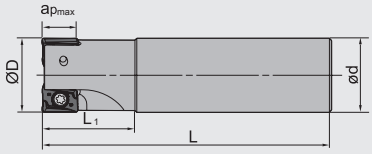

Straight shank


Weldon shank

Weldon shank



Straight shank



Specification of tools

Type		Stock	Basic dimensions(mm)					Number of flute Z	Weight (kg)
			ØD	ød	L	L_1	apmax		
EMP13 Weldon shank	**-025-XP25-AN11-02C**	▲	25	25	100	32	11.2	2	0.31
	-032-XP32-AN11-03C	▲	32	32	115	40	11.2	3	0.61
	-040-XP32-AN11-04C	▲	40	32	125	40	11.2	4	0.75
	-032-XP32-AN15-02C	▲	32	32	125	40	14.5	2	0.66
	-040-XP32-AN15-03C	▲	40	32	125	40	14.5	3	0.76
Straight shank	**-025-G25-AN11-02C**	▲	25	25	100	32	11.2	2	0.31
	-032-G32-AN11-03C	▲	32	32	115	40	11.2	3	0.61
	-040-G32-AN11-04C	▲	40	32	125	40	11.2	4	0.75
	-032-G32-AN15-02C	▲	32	32	125	40	14.5	2	0.66
	-040-G32-AN15-03C	▲	40	32	125	40	14.5	3	0.76

▲Stock available △Make-to-order

Spare parts

Diameter ØD	Inserts	Screw	Wrench	
				
Ø25-Ø40	AN□X11□□□□-GM/LH	I60M3X9	WT09IS	
Ø32-Ø40	AN□X15□□□□-GM/LH	I60M4X12	WT15IS	

Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

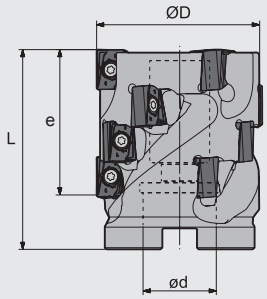
Square shoulder milling tools

Kr:90°

Face milling | Step shoulder | Slot milling | Side milling

EMP13 P M K N S

A-type coupling



Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth Z	Number of inserts	Type of coupling	Weight (kg)
			ØD	ød	L	e				
EMP13	**-050×43-A22-AN11-03**	▲	50	22	60	43	3	12	A	0.52
	-063×65-A27-AN11-04	▲	63	27	80	64	4	24	A	1.15
	-063×53-A27-AN15-03	▲	63	27	75	53	3	12	A	1.14
	-080×56-A32-AN15-04	▲	80	32	75	53	4	16	A	1.82

▲Stock available △Make-to-order

Spare parts

Diameter ØD	Inserts	Screw	Wrench
Ø50-Ø63	AN□X11□□□□-GM/LH	I60M3×9	WT09IS
Ø63-Ø80	AN□X15□□□□-GM/LH	I60M4×12	WT15IS

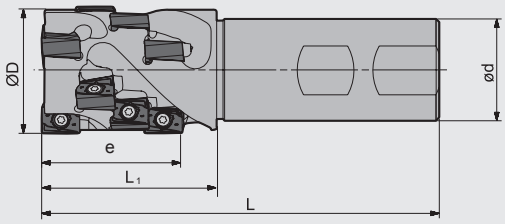
Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Square shoulder milling tools

Kr:90°

EMP13 P M K N S

Weldon shank



Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Number of inserts	Weight (kg)
			ØD	ød	L	L_1	e			
EMP13	**-032×43-XP32-AN11-02**	▲	32	32	115	48	43	2	8	0.61
	-040×43-XP32-AN11-03	▲	40	32	125	55	43	3	12	0.79
	-040×40-XP32-AN15-02	▲	40	32	115	55	40	2	6	0.79
	-050×53-XP40-AN15-02	▲	50	40	145	70	53	2	8	1.53

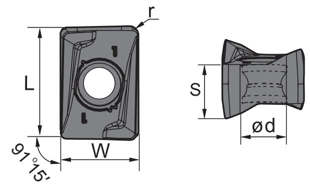
▲Stock available △Make-to-order

Spare parts

Diameter ØD	Inserts	Screw	Wrench
			
Ø32-Ø40	AN□X11□□□□-GM/LH	I60M3X9	WT09IS
Ø40-Ø50	AN□X15□□□□-GM/LH	I60M4X12	WT15IS

Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Selection of inserts



Good working condition / Normal working condition / Bad working condition

Workpiece material	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
P Steel	Normal	Normal	Normal	Normal	Bad				Normal	Normal	Normal	Bad		Good			Good	Good	Bad			
M Stainless steel	Normal	Normal	Normal	Normal	Bad				Normal	Normal	Normal	Bad		Good			Good	Good	Bad			
K Cast iron						Normal	Bad	Good					Normal	Good						Good		Bad
N Non-ferrous metal																					Normal	Bad
S Heat resistant alloy, Ti alloy								Good	Normal	Normal	Normal				Normal	Bad						

Insert shape	Type	L	W	S	ød	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
		Basic dimensions(mm)					CVD Coating							PVD Coating									Cermet		Cemented carbide			
	ANGX110504PNR-GM	11.85	8.4	5.7	3.5	0.4				★		★				★	★											
	ANGX110508PNR-GM	11.85	8.4	5.7	3.5	0.8				★		★				★	★					●						
	ANGX110520PNR-GM	11.85	8.4	5.7	3.5	2.0				★		★	★			★												
	ANGX150608PNR-GM	15.43	11.0	7.3	4.4	0.8				★		★				★	★					●						
	ANGX150616PNR-GM	15.43	11.0	7.3	4.4	1.6				★		★				★	★											
	ANGX150620PNR-GM	15.43	11.0	7.3	4.4	2.0						★	★			★												
	ANMX110508PNR-GM	11.85	8.4	5.7	3.5	0.8				★		★					★					★						
	ANMX150608PNR-GM	15.43	11.0	7.3	4.4	0.8				★		★				★	★											
	ANGX110502PNR-LH	11.85	8.4	5.7	3.5	0.2																					★	
	ANGX110504PNR-LH	11.85	8.4	5.7	3.5	0.4																					★	
	ANGX150608PNR-LH	15.43	11.0	7.3	4.4	0.8																					★	

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

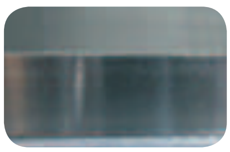
Recommended cutting parameters

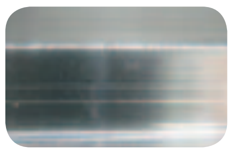
Workpiece material		Hardness HB	Insert grade	Cutting parameters Vc(m/min)	fz(mm/z)	apmax(mm)
P	Low carbon steel	≤180	YBM253 YBG205 YB9320	270(220-350)	0.25(0.1-0.4)	11.2(AN11) 14.5(AN15)
P	Alloy steel	180-350	YBM253 YBG205 YB9320	240(180-320)	0.2(0.1-0.4)	
M	Stainless stee	≤270	YB9320 YBM253	200(110-300) 180(150-300)	0.2(0.1-0.3)	
K	Cast iron	180-260	YBD152 YBD252	270(150-300) 220(120-320)	0.25(0.1-0.4) 0.2(0.1-0.3)	
N	Aluminium alloy	--	YD101	-LH 300-	0.2(0.08-0.4)	
S	Difficult-to-machine materials	≤400	YBS303	100(60-120)	0.15(0.1-0.25)	

Case for EMP13

Workpiece material: NAK80(HRC36)
Tool: EMP13-032-G32-AN15-02C
Insert: ANGX150608PNR-GM/YBG205
Cutting data: fz=0.1mm/z,
Vc=220m/min,
ae=10mm,
ap=14.5mm
Cutting condition: Dry cutting

●Surface quality comparison


EMP13


Company A

Surface quality and perpendicularity of workpiece machined by EMP13 is obviously superior to that of company A.

Profile milling tools

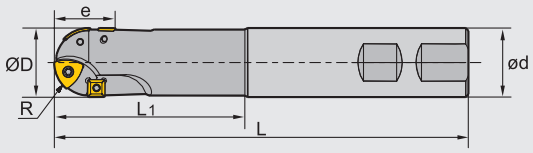

Profile


Side milling(R)


Slot milling

BMR01 P M K

Weldon shank



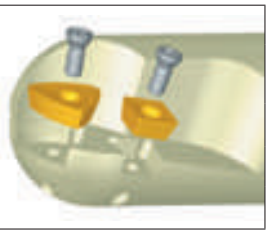
Specification of tools

Type		Stock	Basic dimensions(mm)						Applicable inserts				Weight (kg)
			R	ØD	e	ød	L	L_1	Type	Quantity	Type	Quantity	
BMR01	**-020-XP20-S**	▲	10	20	20	20	125	50	ZDET08T2CYR10	2	SPMT060304	2	0.3
	-020-XP20-M	▲	10	20	20	20	150	75	ZDET08T2CYR10	2	SPMT060304	2	0.3
	-020-XP20-L	▲	10	20	20	20	200	100	ZDET08T2CYR10	2	SPMT060304	2	0.4
	-025-XP25-S	▲	12.5	25	23	25	150	70	ZDET1103CYR12.5	2	SPMT060304	2	0.5
	-025-XP25-M	▲	12.5	25	23	25	175	95	ZDET1103CYR12.5	2	SPMT060304	2	0.6
	-025-XP25-L	▲	12.5	25	23	25	200	100	ZDET1103CYR12.5	2	SPMT060304	2	0.7
	-032-XP32-S	▲	16	32	31	32	175	85	ZDET13T3CYR16	2	SDMT090308	2	0.9
	-032-XP32-M	▲	16	32	31	32	200	100	ZDET13T3CYR16	2	SDMT090308	2	1.1
	-032-XP32-L	▲	16	32	31	32	250	150	ZDET13T3CYR16	2	SDMT090308	2	1.4
	-040-XP40-S	▲	20	40	41	40	175	85	ZPNT2204CY(R20)	3	SPMT120408	2	1.4
	-040-XP40-M	▲	20	40	41	40	200	100	ZPNT2204CY(R20)	3	SPMT120408	2	1.7
	-040-XP40-L	▲	20	40	41	40	250	150	ZPNT2204CY(R20)	3	SPMT120408	2	2.1
	-050-XP40-S	▲	25	50	45	40	200	100	ZPNT2204CY(R25)	3	SPMT120408	2	1.8
	-050-XP40-M	▲	25	50	45	40	300	100	ZPNT2204CY(R25)	3	SPMT120408	2	2.8
	-063-XP40-S	▲	31.5	63	52	40	200	100	ZPNT2204CY(R31)	4	SPMT120408	2	3.0
	-063-XP40-M	▲	31.5	63	52	40	300	100	ZPNT2204CY(R31)	4	SPMT120408	2	3.5

▲Stock available △Make-to-order

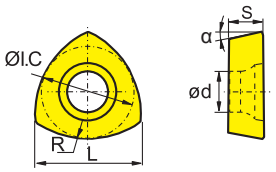
Spare parts

Diameter ØD	Screw	Wrench	
			
Ø20-Ø25	I43M2.5×5.7	WT07IP	--
Ø32	I43M4×8	--	WT15IS
Ø40-Ø63	I43M5×11	--	WT20IS



Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Selection of inserts



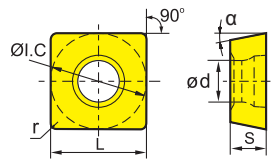
Good working condition Normal working condition Bad working condition

Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating								Cermet		Cemented carbide			
		R	L	ØI.C	S	ød	α	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	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°			○									○									

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order



Good working condition Normal working condition Bad working condition

Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating								Cermet		Cemented carbide			
		r	L	ØI.C	S	ød	α	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SPMT060304	0.4	6.35	6.35	3.18	2.8	11°			○									○									
	SPMT090308	0.8	9.525	9.525	3.18	4.4	15°			○									○									
	SPMT120408	0.8	12.7	12.70	4.76	5.5	11°			●									★									

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				Vc(m/min)	fz(mm/z)
P	Low-carbon steel、Soft steel	≤180	YBM251	180(120-220)	0.25(0.1-0.4)
			YBG302	160(120-220)	0.25(0.1-0.4)
	High-carbon steel、Alloy steel	180-280	YBM251	150(100-200)	0.2(0.1-0.4)
			YBG302	120(100-200)	0.2(0.1-0.4)
	Alloy tool steel	280-350	YBM251	100(80-150)	0.2(0.1-0.3)
			YBG302	100(80-150)	0.2(0.1-0.3)
M	Stainless steel	≤270	YBM251	100(80-150)	0.2(0.1-0.3)
			YBG302	100(80-150)	0.2(0.1-0.3)
K	Cast iron	180-250	YBG302	150(100-180)	0.3(0.2-0.5)

Profile milling tools

BMR02 P M K

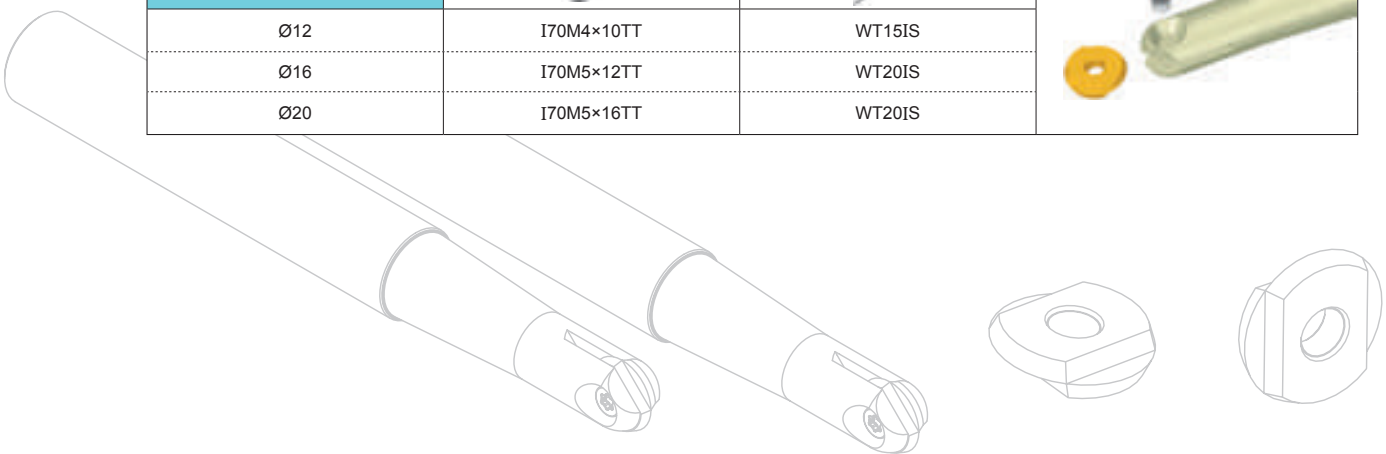
Specification of tools

Type		Stock	Basic dimensions(mm)					Weight (kg)
			R	ØD	ød	L	L_1	
BMR02	-012-G16-S	▲	6	12	16	110	40	0.1
	-012-G16-M	▲	6	12	16	130	50	0.2
	-012-G16-L	▲	6	12	16	160	50	0.2
	-016-G20-S	▲	8	16	20	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

▲Stock available △Make-to-order

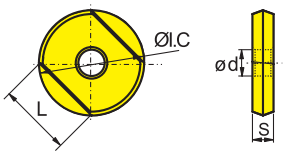
Spare parts

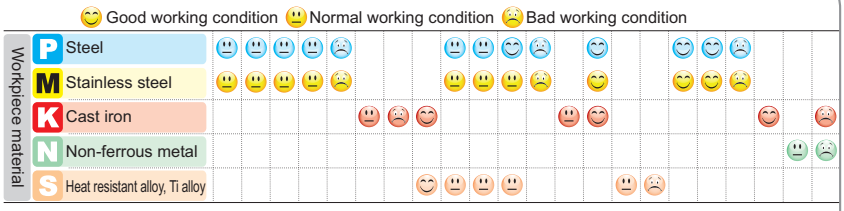
Diameter ØD	Screw	Wrench
Ø12	I70M4×10TT	WT15IS
Ø16	I70M5×12TT	WT20IS
Ø20	I70M5×16TT	WT20IS



Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Selection of inserts





Insert shape	Type	Basic dimensions(mm)				CVD Coating							PVD Coating								Cermet		Cemented carbide			
		ØI.C	L	S	ød	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**ROHX1203**	12	8.5	3	4														○								
	ROHX1604	16	11.3	4	5														○								
	ROHX2005	20	14.1	5	5														○								

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

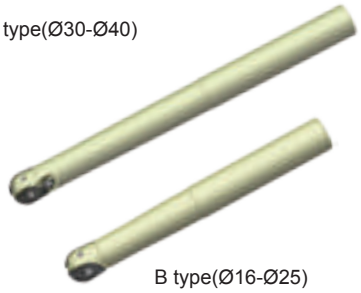
Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters	Diameter		
					Ø12	Ø16	Ø20
P	Carbon steel	HB≤180	YBG252	Vc(m/min)	100~200	100~200	100~200
				fz(mm/z)	0.15~0.25	0.2~0.3	0.2~0.3
				a_{pmax}(mm)	0.8	1.0	1.25
				a_{emax}(mm)	0.8	1.0	1.25
	Alloy steel	HB180~280		Vc(m/min)	80~180	80~180	80~180
				fz(mm/z)	0.15~0.25	0.2~0.3	0.2~0.3
				a_{pmax}(mm)	0.8	1.0	1.25
				a_{emax}(mm)	0.8	1.0	1.25
	Hardened steel	HRC55~65		Vc(m/min)	60~100	60~100	60~100
				fz(mm/z)	0.15~0.25	0.2~0.3	0.2~0.3
				a_{pmax}(mm)	0.4	0.5	0.6
				a_{emax}(mm)	0.4	0.5	0.6
M	Stainless steel	HB≤270		Vc(m/min)	70~150	70~150	70~150
				fz(mm/z)	0.1~0.2	0.1~0.25	0.1~0.25
				a_{pmax}(mm)	0.6	0.8	1.0
				a_{emax}(mm)	0.6	0.8	1.0
K	Cast iron	HB180-250		Vc(m/min)	160~300	160~300	160~300
				fz(mm/z)	0.2~0.3	0.25~0.35	0.25~0.35
				a_{pmax}(mm)	1.0	1.5	1.8
				a_{emax}(mm)	1.0	1.5	1.8

Profile milling tools

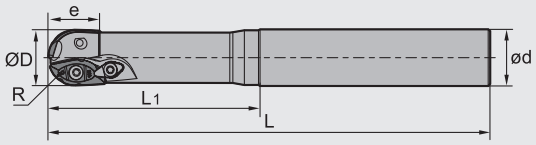
BMR03 P M K

A type(Ø30-Ø40)

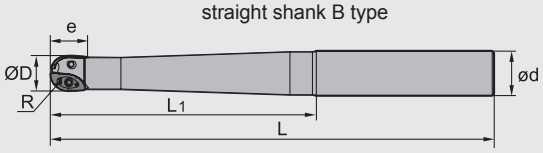


B type(Ø16-Ø25)

straight shank A type



straight shank B type



Specification of tools

Type		Stock	Basic dimensions(mm)						Number of teeth Z	Weight (kg)	Type	Clamp
			R	ØD	ød	L	L1	e				
BMR03	**-016-G20-S**	▲	8	16	20	150	70	16	2	0.3	B	--
	-016-G20-M	▲	8	16	20	180	80	16	2	0.4	B	
	-020-G25-S	▲	10	20	25	180	80	20	2	0.5	B	
	-020-G25-M	▲	10	20	25	200	100	20	2	0.6	B	
	-020-G25-L	▲	10	20	25	250	150	20	2	0.7	B	
	-020-G25-XL	▲	10	20	25	300	110	20	2	1.0	B	
	-025-G25-S	▲	12.5	25	25	180	80	25	2	0.6	B	
	-025-G25-M	▲	12.5	25	25	200	100	25	2	0.7	B	
	-025-G25-L	▲	12.5	25	25	250	110	25	2	0.8	B	
	-025-G25-XL	▲	12.5	25	25	300	120	25	2	1.0	B	
	-030-G32-S	△	15	30	32	200	120	30	2	1.0	A	WD-208
	-030-G32-M	▲	15	30	32	250	150	30	2	1.3	A	
	-030-G32-L	▲	15	30	32	300	200	30	2	1.6	A	
	-030-G32-XL	△	15	30	32	350	200	30	2	1.9	A	
	-032-G32-S	▲	16	32	32	200	120	32	2	1.1	A	
	-032-G32-M	▲	16	32	32	250	150	32	2	1.4	A	
	-032-G32-L	▲	16	32	32	300	200	32	2	1.6	A	
	-032-G32-XL	△	16	32	32	350	200	32	2	2.0	A	
	-040-G40-S	△	20	40	40	200	120	40	2	1.6	A	CBH5R1
	-040-G40-M	▲	20	40	40	250	150	40	2	2.0	A	
	-040-G40-L	▲	20	40	40	300	200	40	2	2.5	A	
	-040-G40-XL	△	20	40	40	350	200	40	2	3.0	A	

▲Stock available △Make-to-order

Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

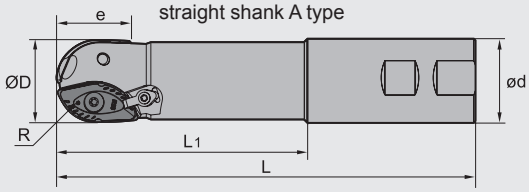
Profile milling tools

BMR03 P M K

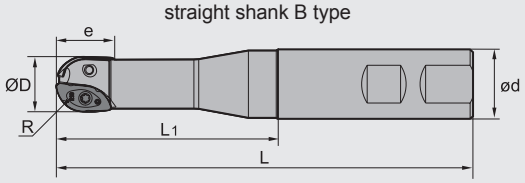
A type(Ø30-Ø50)

B type(Ø16-Ø25)

straight shank A type



straight shank B type



Specification of tools

Type		Stock	Basic dimensions(mm)						Number of teeth Z	Weight (kg)	Type	Clamp
			R	ØD	ød	L	L_1	e				
BMR03	**-016-XP20-M**	▲	8	16	20	111	60	16	2	0.2	B	--
	-020-XP25-M	▲	10	20	25	127	70	20	2	0.3	B	
	-020-XP25-L	▲	10	20	25	150	80	20	2	0.4	B	
	-025-XP25-M	▲	12.5	25	25	137	80	25	2	0.4	B	
	-025-XP25-L	▲	12.5	25	25	200	100	25	2	0.6	B	
	-030-XP32-M	▲	15	30	32	161	100	30	2	0.8	A	WD-208
	-030-XP32-L	▲	15	30	32	250	150	30	2	1.3	A	
	-032-XP32-M	▲	16	32	32	161	100	32	2	0.8	A	
	-032-XP32-L	▲	16	32	32	250	120	32	2	1.3	A	
	-040-XP40-M	▲	20	40	40	175	100	40	2	1.3	A	CBH5R1
	-040-XP40-L	▲	20	40	40	250	120	40	2	2.0	A	
	-050-XP50-M	▲	25	50	50	200	100	50	2	2.5	A	
	-050-XP50-L	▲	25	50	50	250	150	50	2	3.1	A	

▲Stock available △Make-to-order

Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

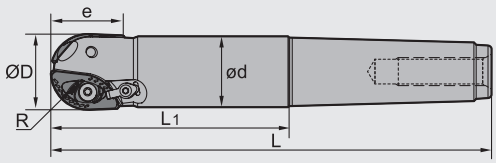
Profile milling tools

BMR03 P M K

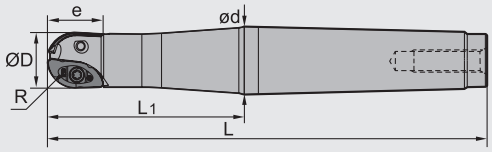
A type(Ø30-Ø50)

B type(Ø20-Ø25)

Morse taper shank A type



Morse taper shank B type



Specification of tools

Type		Stock	Basic dimensions(mm)						Number of teeth Z	Weight (kg)	Type	Clamp
			R	ØD	ød	L	L1	e				
BMR03	**-020-MT3-M**	▲	10	20	18.7	156	70	20	2	0.4	B	--
	-020-MT3-L	△	10	20	18.7	186	100	20	2	0.4	B	
	-025-MT3-M	▲	12.5	25	23.5	156	70	25	2	0.4	B	
	-025-MT3-L	△	12.5	25	23.5	186	100	25	2	0.4	B	
	-030-MT4-M	▲	15	30	28.2	189	70	30	2	0.8	A	WD-208
	-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	

▲Stock available △Make-to-order

Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Profile milling tools


Profile

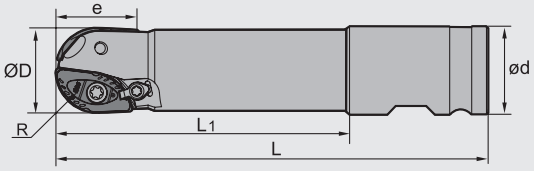
Side milling(R)

Slot milling

Helical machining

BMR03 P M K

Compound shank



Specification of tools

Type		Stock	Basic dimensions(mm)						Number of teeth Z	Weight (kg)	Clamp
			R	ØD	ød	L	L1	e			
BMR03	-040-XPX-M	▲	20	40	50.8	250	170	40	2	1.3	CBH5R1
	-040-XPX-L	▲	20	40	50.8	300	220	40	2	3.1	
	-040-XPX-XL	▲	20	40	50.8	350	270	40	2	3.5	
	-050-XPX-M	▲	25	50	50.8	250	170	50	2	3.1	
	-050-XPX-L	▲	25	50	50.8	300	200	50	2	3.8	
	-050-XPX-XL	▲	25	50	50.8	350	270	50	2	4.4	

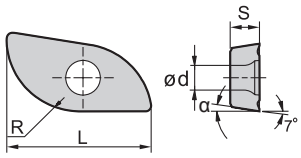
▲Stock available △Make-to-order

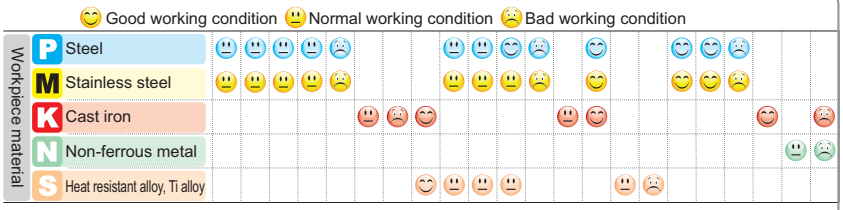
Spare parts

Diameter ØD	Clamp	Screw	Wrench	
Ø16	--	I60M2.5×6.5	--	WT07P
Ø20	--	I60M3.5×08TT		WT10IP
Ø25	--	I60M4×10		WT15S
Ø30	WD-208	I60M5×13	WT20IT	--
Ø32	WD-208	I60M5×13		
Ø40	CBH5R1	I43M6×16	WT25IT	
Ø50	CBH5R1	I43M8×21 I43M6×16	WT25IT WT30IT	

Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

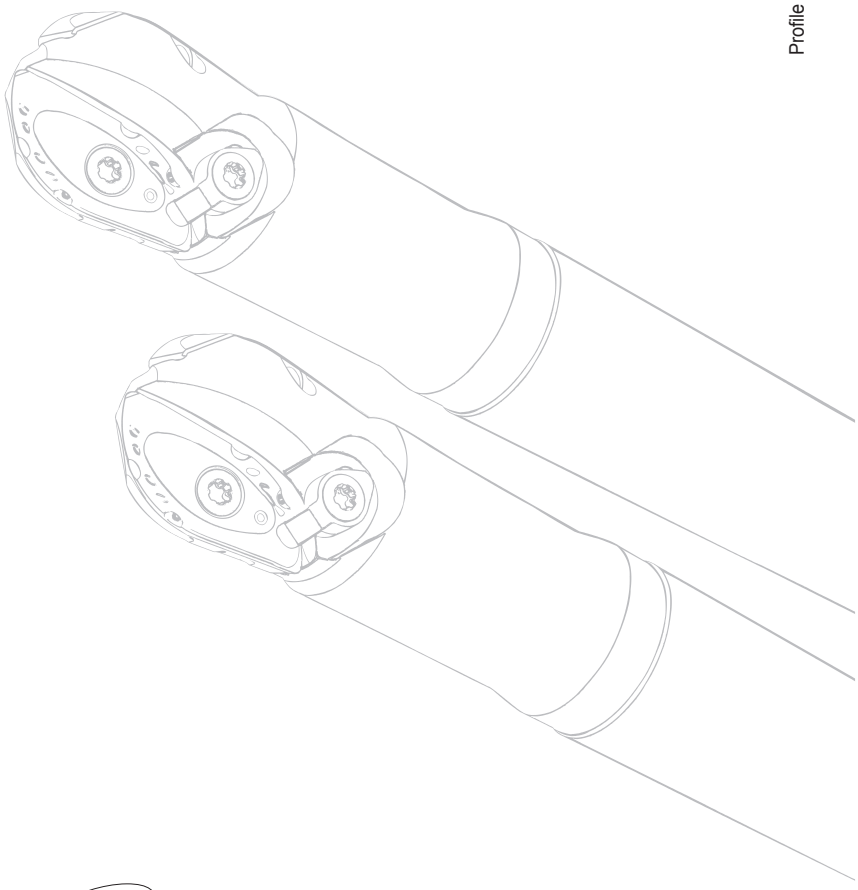
Selection of inserts



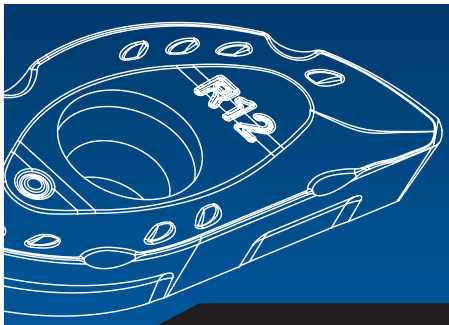


Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating								Cermet		Cemented carbide			
		R	ød	S	α	L	Applicable tools	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**XPHT16R0803-GM**	8	3.1	3.18	9°	16	ø16												★										
	XPHT20R10T3-GM	10	4.0	3.97	9°	20	ø20												★										
	XPHT25R1204-GM	12.5	4.7	4.76	9°	25	ø25												★										
	XPHT30R1506-GM	15	5.8	6.35	11°	30	ø30												★										
	XPHT32R1606-GM	16	5.8	6.35	9°	32	ø32												★										
	XPHT40R2007-GM	20	6.7	7.94	9°	40	ø40												★										
	XPHT50R2507-GM	25	9.2	7.94	9°	50	ø50												★										

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order



Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

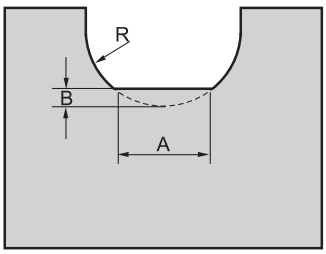


BMR03

series ball nose end milling tools

- The unique chipbreaker and big rake angle can effectively control the curling and flowing direction of chips and reduce the cutting force, improving workpiece surface quality and tool life.
- After precise grinding of periphery and locating surface, the insert can sufficiently ensure the shape accuracy of cutting edge and the precision of installation and location, improving installation security and workpiece precision after machining.
- The concave structure of the flank can effectively enhance the strength of cutting edge and prevent scraping between the clearance face and workpiece surface. Therefore, it improves the workpiece surface quality and prolongs the life of insert.
- The designs of cutting edge over center and a large negative rake angle make it possible to cut vertically, thus anti-breakage capability is enhanced.
- The rough ball nose milling cutters with large diameter adopt the top and hole clamping style, so insert clamping becomes more firm and stable. The machining is also highly efficient even under poor conditions such as long overhang and large vibration, etc.
- The adapter types include straight shank, Weldon shank, Morse taper shank and combination shank.

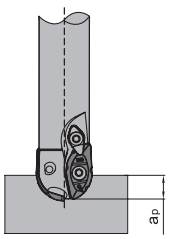
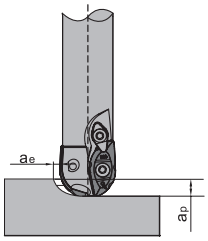
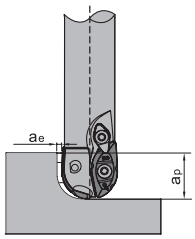
Slot shape after machining



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

Cautions:
The insert edge should correspond to the locating face of insert pocket in the tool. Don't install the wrong side up.
Before screwing down the insert, confirm the good connection between insert and insert pocket.
Select and adjust the cutting parameters according to machine power and machining conditions.
If vibration occurs in the machining process, cutting speed should be reduced properly.

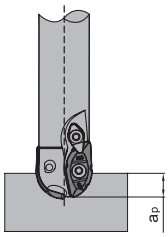
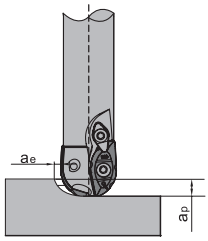
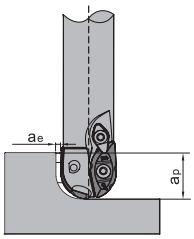
Recommended cutting parameters Diameter Ø16

Operations					
Workpiece material	Cutting parameters	Machining of slot	Side milling (slight)		Side milling (deep)	Insert grade
Medium carbon steel Hardness 150~250HB	Vc(m/min)	150~220	150~220	150~220	150~220	YBG302
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a_p(mm)	4	4	8	16	
	a_e(mm)	--	3	4	1.5	
Alloy steel Hardness 150~280HB	Vc(m/min)	100~150	100~150	100~150	100~150	
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a_p(mm)	4	4	8	16	
	a_e(mm)	--	3	4	1.5	
Die steel Hardness 150~255HB	Vc(m/min)	80~120	80~120	80~120	80~120	
	Fz(mm/z)	0.1~0.3	0.1~0.3	0.1~0.3	0.1~0.3	
	a_p(mm)	4	4	8	16	
	a_e(mm)	--	3	4	1.5	
Hardened steel Hardness 40~50HRC	Vc(m/min)	80~100	80~100	80~100	--	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	--	
	a_p(mm)	4	4	8	--	
	a_e(mm)	--	2	3	--	
Gray cast iron Hardness 160~260HB	Vc(m/min)	250~300	250~300	250~300	250~300	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a_p(mm)	4	4	8	16	
	a_e(mm)	--	3	4	1.5	
Nodular cast iron Hardness 170~300HB	Vc(m/min)	200~250	200~250	200~250	200~250	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a_p(mm)	4	4	8	16	
	a_e(mm)	--	3	4	1.5	

Note: 1. Parameters in the table shall be adjusted according to the rigidity of the machine or workpiece.

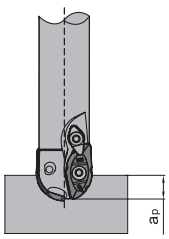
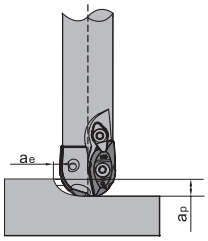
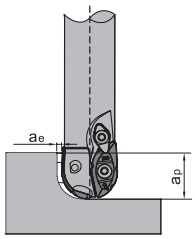
2. Wind cooling to be preferred.

Recommended cutting parameters Diameter Ø20

Operations					
Workpiece material	Cutting parameters	Machining of slot	Side milling (slight)		Side milling (deep)	Insert grade
Medium carbon steel Hardness 150~250HB	Vc(m/min)	150~220	150~220	150~220	150~220	YBG302
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a_p(mm)	5	5	10	20	
	a_e(mm)	--	4	5	2	
Alloy steel Hardness 150~280HB	Vc(m/min)	100~150	100~150	100~150	100~150	
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a_p(mm)	5	5	10	20	
	a_e(mm)	--	4	5	2	
Die steel Hardness 150~255HB	Vc(m/min)	80~120	80~120	80~120	80~120	
	Fz(mm/z)	0.1~0.3	0.1~0.3	0.1~0.3	0.1~0.3	
	a_p(mm)	5	5	10	20	
	a_e(mm)	--	4	5	2	
Hardened steel Hardness 40~50HRC	Vc(m/min)	80~100	80~100	80~100	--	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	--	
	a_p(mm)	5	5	10	--	
	a_e(mm)	--	4	5	--	
Gray cast iron Hardness 160~260HB	Vc(m/min)	250~300	250~300	250~300	250~300	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a_p(mm)	5	5	10	20	
	a_e(mm)	--	4	5	2	
Nodular cast iron Hardness 170~300HB	Vc(m/min)	200~250	200~250	200~250	200~250	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a_p(mm)	5	5	10	20	
	a_e(mm)	--	4	5	2	

Note: 1. Parameters in the table shall be adjusted according to the rigidity of the machine or workpiece.
2. Wind cooling to be preferred.

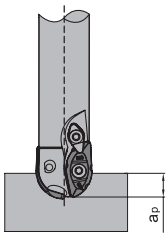
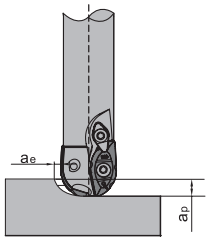
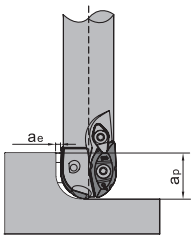
Recommended cutting parameters Diameter Ø25

Operations					
Workpiece material	Cutting parameters	Machining of slot	Side milling (slight)		Side milling (deep)	Insert grade
Medium carbon steel Hardness 150~250HB	Vc(m/min)	150~220	150~220	150~220	150~220	YBG302
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a_p(mm)	6	6	12.5	25	
	a_e(mm)	--	5	6.5	3	
Alloy steel Hardness 150~280HB	Vc(m/min)	100~150	100~150	100~150	100~150	
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a_p(mm)	6	6	12.5	25	
	a_e(mm)	--	5	6.5	3	
Die steel Hardness 150~255HB	Vc(m/min)	80~120	80~120	80~120	80~120	
	Fz(mm/z)	0.1~0.3	0.1~0.3	0.1~0.3	0.1~0.3	
	a_p(mm)	6	6	12.5	25	
	a_e(mm)	--	5	6.5	3	
Hardened steel Hardness 40~50HRC	Vc(m/min)	80~100	80~100	80~100	--	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	--	
	a_p(mm)	6	6	12.5	--	
	a_e(mm)	--	5	6.5	--	
Gray cast iron Hardness 160~260HB	Vc(m/min)	250~300	250~300	250~300	250~300	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a_p(mm)	6	6	12.5	25	
	a_e(mm)	--	5	6.5	3	
Nodular cast iron Hardness 170~300HB	Vc(m/min)	200~250	200~250	200~250	200~250	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a_p(mm)	6	6	12.5	25	
	a_e(mm)	--	5	6.5	3	

Note: 1. Parameters in the table shall be adjusted according to the rigidity of the machine or workpiece.

2. Wind cooling to be preferred.

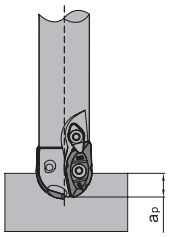
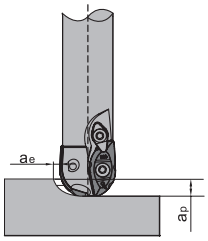
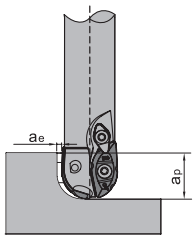
Recommended cutting parameters Diameter Ø30, Ø32

Operations					
Workpiece material	Cutting parameters	Machining of slot	Side milling (slight)		Side milling (deep)	Insert grade
Medium carbon steel Hardness 150~250HB	Vc(m/min)	150~220	150~220	150~220	150~220	YBG302
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a_p(mm)	10	10	16	28	
	a_e(mm)	--	6	9	6	
Alloy steel Hardness 150~280HB	Vc(m/min)	100~150	100~150	100~150	100~150	
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a_p(mm)	10	10	16	28	
	a_e(mm)	--	6	9	6	
Die steel Hardness 150~255HB	Vc(m/min)	80~120	80~120	80~120	80~120	
	Fz(mm/z)	0.1~0.3	0.1~0.3	0.1~0.3	0.1~0.3	
	a_p(mm)	10	10	16	28	
	a_e(mm)	--	6	9	6	
Hardened steel Hardness 40~50HRC	Vc(m/min)	80~100	80~100	80~100	--	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	--	
	a_p(mm)	10	10	16	--	
	a_e(mm)	--	6	9	--	
Gray cast iron Hardness 160~260HB	Vc(m/min)	250~300	250~300	250~300	250~300	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a_p(mm)	10	10	16	28	
	a_e(mm)	--	6	9	6	
Nodular cast iron Hardness 170~300HB	Vc(m/min)	200~250	200~250	200~250	200~250	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a_p(mm)	10	10	16	28	
	a_e(mm)	--	6	9	6	

Note: 1. Parameters in the table shall be adjusted according to the rigidity of the machine or workpiece.

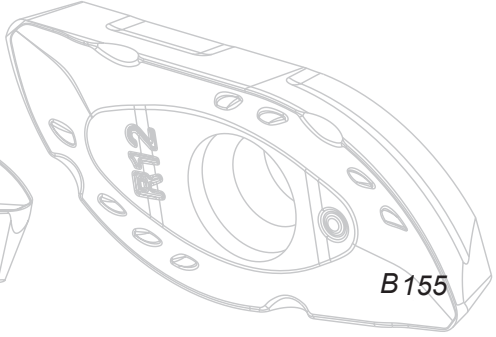
2. Wind cooling to be preferred.

Recommended cutting parameters Diameter Ø40

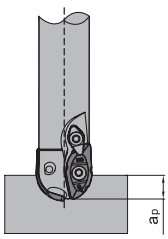
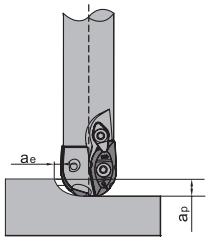
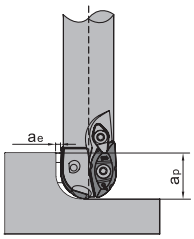
Operations					
Workpiece material	Cutting parameters	Machining of slot	Side milling (slight)		Side milling (deep)	Insert grade
Medium carbon steel Hardness 150~250HB	Vc(m/min)	150~220	150~220	150~220	150~220	YBG302
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a_p(mm)	12	10	20	35	
	a_e(mm)	--	8	12	8	
Alloy steel Hardness 150~280HB	Vc(m/min)	100~150	100~150	100~150	100~150	
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a_p(mm)	12	10	20	35	
	a_e(mm)	--	8	12	8	
Die steel Hardness 150~255HB	Vc(m/min)	80~120	80~120	80~120	80~120	
	Fz(mm/z)	0.1~0.3	0.1~0.3	0.1~0.3	0.1~0.3	
	a_p(mm)	12	10	20	35	
	a_e(mm)	--	8	12	8	
Hardened steel Hardness 40~50HRC	Vc(m/min)	80~100	80~100	80~100	--	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	--	
	a_p(mm)	12	10	20	--	
	a_e(mm)	--	8	12	--	
Gray cast iron Hardness 160~260HB	Vc(m/min)	250~300	250~300	250~300	250~300	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a_p(mm)	12	10	20	35	
	a_e(mm)	--	8	12	8	
Nodular cast iron Hardness 170~300HB	Vc(m/min)	200~250	200~250	200~250	200~250	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a_p(mm)	12	10	20	35	
	a_e(mm)	--	8	12	8	

Note: 1. Parameters in the table shall be adjusted according to the rigidity of the machine or workpiece.

2. Wind cooling to be preferred.



Recommended cutting parameters Diameter Ø50

Operations						
Workpiece material	Cutting parameters	Machining of slot	Side milling (slight)		Side milling (deep)	Insert grade
Medium carbon steel Hardness 150~250HB	Vc(m/min)	150~220	150~220	150~220	150~220	YBG302
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a_p(mm)	15	10	25	40	
	a_e(mm)	--	10	15	10	
Alloy steel Hardness 150~280HB	Vc(m/min)	100~150	100~150	100~150	100~150	
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a_p(mm)	15	10	25	40	
	a_e(mm)	--	10	15	10	
Die steel Hardness 150~255HB	Vc(m/min)	80~120	80~120	80~120	80~120	
	Fz(mm/z)	0.1~0.3	0.1~0.3	0.1~0.3	0.1~0.3	
	a_p(mm)	15	10	25	40	
	a_e(mm)	--	10	15	10	
Hardened steel Hardness 40~50HRC	Vc(m/min)	80~100	80~100	80~100	--	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	--	
	a_p(mm)	15	10	25	--	
	a_e(mm)	--	10	15	--	
Gray cast iron Hardness 160~260HB	Vc(m/min)	250~300	250~300	250~300	250~300	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a_p(mm)	15	10	25	40	
	a_e(mm)	--	10	15	10	
Nodular cast iron Hardness 170~300HB	Vc(m/min)	200~250	200~250	200~250	200~250	
	Fz(mm/z)	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	
	a_p(mm)	15	10	25	40	
	ae(mm)	--	10	15	10	

Note: 1. Parameters in the table shall be adjusted according to the rigidity of the machine or workpiece.

2. Wind cooling to be preferred.

Profile milling tools

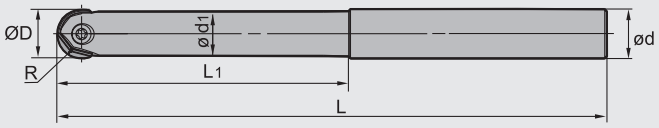

Side milling(R)

Slot milling

Profile

BMR04 P M K

Straight shank with straight neck



Specification of tools

Type		Stock	Basic dimensions(mm)						Weight (kg)
			R	ØD	ød	ød1	L1	L	
BMR04	-012-G12-M	▲	6	12	12	11	35	125	0.1
	-012-G12-L	△	6	12	12	11	45	150	0.1
	-016-G16-M	▲	8	16	16	14	40	150	0.2
	-016-G16-L	△	8	16	16	14	55	180	0.3
	-020-G20-M	▲	10	20	20	18	65	180	0.4
	-020-G20-L	△	10	20	20	18	100	250	0.6
	-025-G25-M	▲	12.5	25	25	23	70	200	0.7
	-025-G25-L	△	12.5	25	25	23	100	250	0.9
	-030-G32-M	▲	15	30	32	27	130	250	1.2
	-030-G32-L	△	15	30	32	27	150	300	1.5
	-032-G32-M	▲	16	32	32	29	80	250	1.4
	-032-G32-L	△	16	32	32	29	109	300	1.7

▲Stock available △Make-to-order

Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

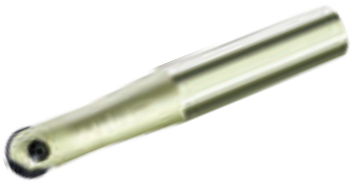
Profile milling tools


Side milling(R)

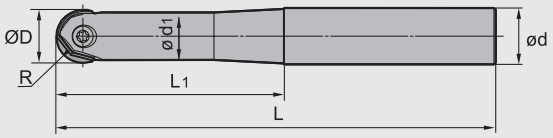
Slot milling

Profile

BMR04 P M K



Straight shank with taper neck



Specification of tools

Type		Stock	Basic dimensions(mm)						Weight (kg)
			R	ØD	ød	ød1	L1	L	
BMR04	-012-G16-M	▲	6	12	16	11	50	125	0.2
	-012-G16-L	△	6	12	16	11	60	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	85	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

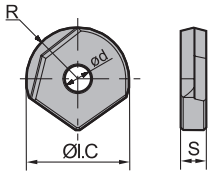
▲Stock available △Make-to-order

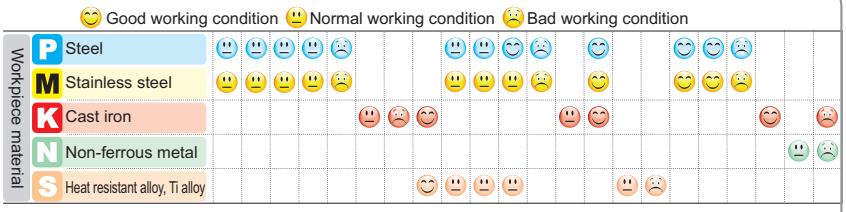
Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

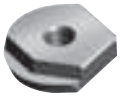
Spare parts

Diameter	Screw	Wrench	
Ø12	I70M4×10TT	WT15IP	--
Ø16	I70M5×12TT	WT20IP	--
Ø20	I70M5×16TT	WT20IP	--
Ø25	I70M6×20TT	WT20IP	--
Ø30	I70M8×25TT	--	WT30IT
Ø32	I70M8×25TT	--	WT30IT

Selection of inserts



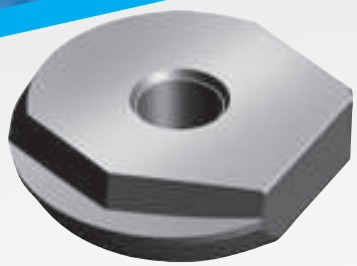


Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating							Cermet		Cemented carbide			
		R	ØI.C	S	ød	Applicable insert ØD	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	ZOHX1203-GF	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													★								

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

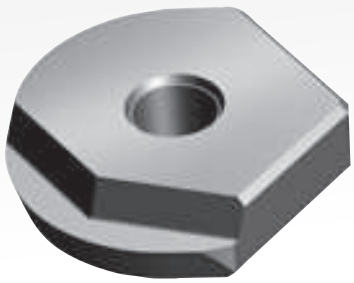
BMR04

Series ball nose finishing end milling tools



-GF

- With positive rake angle and double clearance angle, the design of curved cutting edge combines sharpness and strength. The edge with high precision is applicable under stable machining conditions and in conditions requiring high workpiece profile precision.



-GM

- 0° rake angle, only one clearance angle, high edge strength, suitable for conditions requiring high cutting efficiency.

The inserts are a combination of ultra-fine cemented carbide substrate and nano coating grade YBG252. With excellent cutting performance, they are suitable for semi-finish to finish machining.

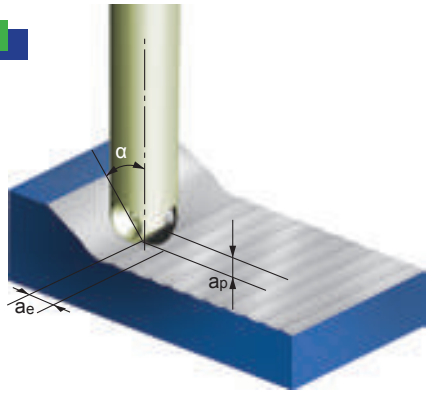
Calculation of cutting speed for BMR02/04 series ball nose end mills

1.When the tool axial line is vertical to the surface being machined,

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

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

N：rotating speed
Vc：actual cutting speed
Dc：effective cutting diameter
D：tool nominal diameter
a_p：axial cutting depth



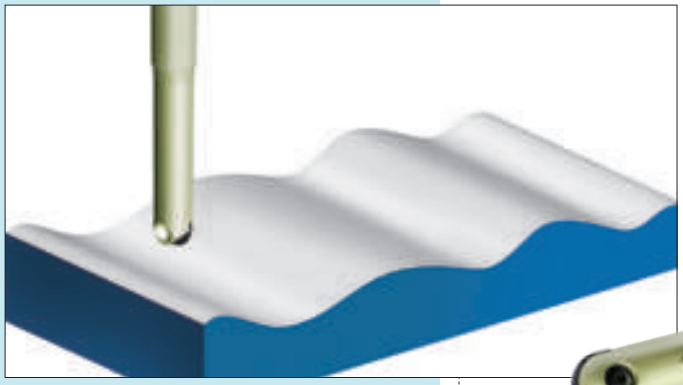
2.When there is an inclined angle between the tool axial line and the surface being machined, the recommended cutting speed should be multiplied by a factor in the table below to obtain the cutting speed used for programming.

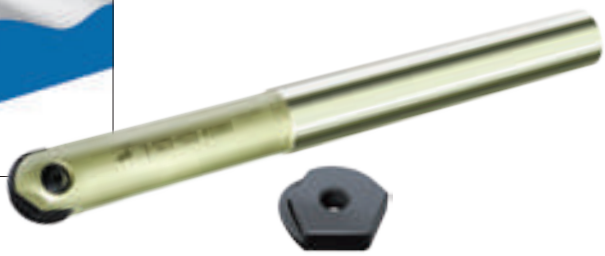
Diameter(mm)		Ø12		Ø16		Ø20		Ø25		Ø30		Ø32	
Cutting depth ap(mm)		0.2	0.5	0.2	0.5	0.5	1	0.5	1	0.5	1.5	0.5	1.5
Inclined angle α	15°	1.00	1.00	1.00	1.00	1.00	1.02	1.00	1.01	1.00	1.00	1.00	1.00
	30°	1.04	1.01	1.05	1.01	1.02	1.04	1.03	1.04	1.04	1.01	1.04	1.00
	45°	1.16	1.07	1.18	1.10	1.12	1.06	1.14	1.08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

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters	Tool specification					
					Ø12	Ø16	Ø20	Ø25	Ø30	Ø32
P	Carbon steel	HB≤180	YBG252	Vc(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
				$a_p$max(mm)	0.8	1.0	1.25	1.5	2.0	2.0
				$a_e$max(mm)	0.8	1.0	1.25	1.5	2.0	2.0
	Alloy stee	HB180~280		Vc(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
				$a_p$max(mm)	0.8	1.0	1.25	1.5	2.0	2.0
				$a_e$max(mm)	0.8	1.0	1.25	1.5	2.0	2.0
	Hardened steel	HRC55~65		Vc(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
				$a_p$max(mm)	0.4	0.5	0.6	0.8	1.0	1.0
				$a_e$max(mm)	0.4	0.5	0.6	0.8	1.0	1.0
M	Stainless steel	HB≤270		Vc(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
				$a_p$max(mm)	0.6	0.8	1.0	1.25	1.5	1.5
				$a_e$max(mm)	0.6	0.8	1.0	1.25	1.5	1.5
K	Cast iron	HB180~250		Vc(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
				$a_p$max(mm)	1.0	1.5	1.8	2.0	2.5	2.5
				$a_e$max(mm)	1.0	1.5	1.8	2.0	2.5	2.5

Case for BMR04





Tool type：BMR04-020-G25-M

Insert type/grade：ZOHX2005-GM/YBG252

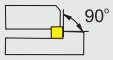
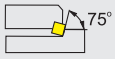
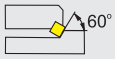
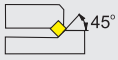
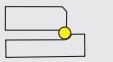
Workpiece material：42CrMo (HRC35)
Cooling system: Dry cutting
Machine: Vertical machining center
Cutting parameters：
Vc=150m/min
a_p=0.1mm
fz=0.2mm/Z

●Abrasion comparison of inserts after milling curved face

	ZCC·CT	Other company product
After 60 minutes of cutting	 Abrasion on the clearance face 0.08	 Abrasion on the clearance face 0.10
After 120 minutes of cutting	 Abrasion on the clearance face 0.12	 Abrasion on the clearance face 0.16

Side and face milling tools code key

Cutter style	
FM	Face milling
EM	Square shoulder milling
HM	Helical end milling
SM	Side and face milling
BM	Profile milling
CM	Chamfer milling
XM	Special milling
TM	T-slot milling
AM	Aluminum alloy high speed milling

Approach angle		
P	90°	
E	75°	
D	60°	
A	45°	
R		

Sequence number of series

Cutting diameter ØD (mm)

Cutting width of milling tools

Coupling structure and demension

A	A type of coupling	D	D type of coupling
B	B type of coupling	K	Mounting by keyway
C	C type of coupling		

SM P 03 - 160 × 16 - K40 - M P 12 - 12 L

Insert shape	
C	Diamond with 80°
D	Diamond with 55°
R	Round
S	Square
T	Regular triangle
V	Diamond with 35°
M	Diamond with 86°

Insert clearance angle	
N	0°
B	5°
C	7°
P	11°
D	15°
E	20°

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

Cutting direction

(R: Right L: Left)

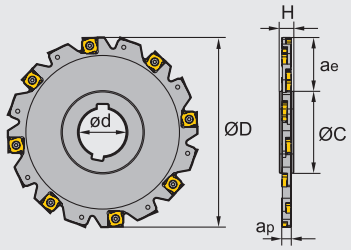
Number of teeth

Side and face milling tools


Machining of slot

SMP01 P M K

K-type coupling



Specification of tools

Type		Stock	Basic dimensions(mm)						Applicable inserts	Number of teeth Z	Type of coupling	Weight (kg)
			ØD	ød	øc	H	ap	aemax				
SMP01 Mounting by keyway	**-100×4-K27-SN12-10**	△	100	27	45	12	4	25	XSEQ1202	10	K	0.2
	-125×4-K40-SN12-12	△	125	40	56	12	4	32		12	K	0.3
	-160×4-K40-SN12-16	△	160	40	67	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	56	12	5	32		12	K	0.3
	-160×5-K40-SN12-16	△	160	40	67	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	56	12	6	32		12	K	0.4
	-160×6-K40-SN12-16	△	160	40	67	12	6	44		16	K	0.7
	-200×6-K50-SN12-18	△	200	50	71	12	6	62		18	K	1.1
	-250×6-K50-SN12-24	△	250	50	71	12	6	87		24	K	1.7
	-100×7-K27-SN12-10	△	100	27	45	12	7	25	XSEQ1204	10	K	0.3
	-125×7-K40-SN12-12	△	125	40	56	12	7	32		12	K	0.4
	-160×7-K40-SN12-16	△	160	40	67	12	7	44		16	K	0.8
	-200×7-K50-SN12-18	△	200	50	71	12	7	62		18	K	1.2
	-250×7-K50-SN12-24	△	250	50	71	12	7	87		24	K	1.9
	-100×8-K27-SN12-10	△	100	27	45	12	8	25	XSEQ12T4	10	K	0.3
	-125×8-K40-SN12-12	△	125	40	56	12	8	32		12	K	0.5
	-160×8-K40-SN12-16	△	160	40	67	12	8	44		16	K	0.9
	-200×8-K50-SN12-18	△	200	50	71	12	8	62		18	K	1.4
	-250×8-K50-SN12-24	△	250	50	71	12	8	87		24	K	2.2

▲Stock available △Make-to-order

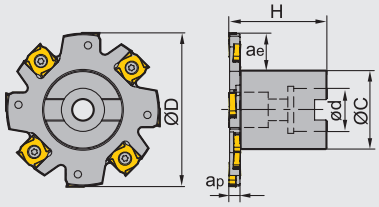
Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Side and face milling tools

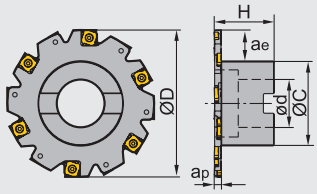
Machining of slot

SMP01 P M K

A-type coupling



B-type coupling



Specification of tools

Type		Stock		Basic dimensions(mm)						Applicable inserts	Number of teeth Z	Type of coupling	Weight (kg)
		R	L	ØD	ød	øc	H	a_p	a_{emax}				
SMP01 Arbor mounting	**-063×4-A22-SN12-06**	△	△	63	22	32	40	4	14	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	32	40	5	14	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	32	40	6	14	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-B32-SN12-12	△	△	125	32	70	50	6	30		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	32	40	7	14	XSEQ1204	6	A	0.2
	-080×7-A22-SN12-08	△	△	80	22	40	50	7	18		8	A	0.5
	-100×7-A27-SN12-10	△	△	100	27	48	50	7	23		10	A	0.7
	-125×7-B32-SN12-12	△	△	125	32	70	50	7	30		12	B	1.1
	-160×7-B40-SN12-16	△	△	160	40	70	50	7	41		16	B	1.4
	-063×8-A22-SN12-06	△	△	63	22	32	40	8	14	XSEQ12T4	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		10	A	0.8
	-125×8-B32-SN12-12	△	△	125	32	70	50	8	30		12	B	1.1
	-160×8-B40-SN12-16	△	△	160	40	70	50	8	41		16	B	1.5

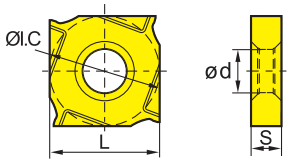
▲Stock available △Make-to-order

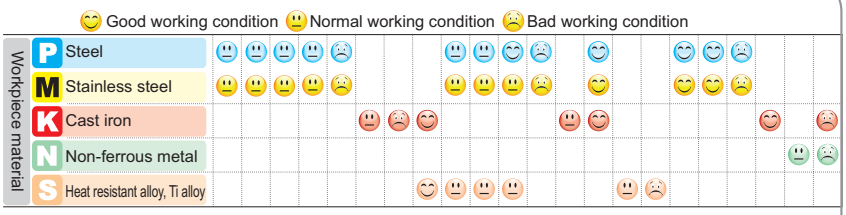
Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Spare parts

Diameter ØD	Edge width ap	Screw	Wrench
Ø63-Ø160	4	I91M4×3.2X	WT08IS/IP
Ø63-Ø160	5	I91M4×4.2X	
Ø63-Ø250	6	I91M4×5.1X	
Ø63-Ø250	7	I91M4×6.1X	
Ø63-Ø250	8	I91M4×7.1X	

Selection of inserts





Insert shape	Type	Basic dimensions(mm)				CVD Coating							PVD Coating							Cermet		Cemented carbide			
		ØI.C	L	S	ød	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	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												★										

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

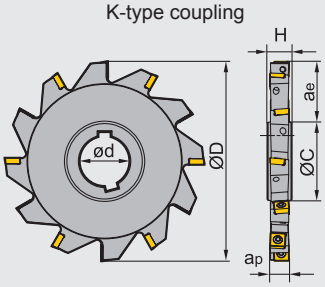
Cutting parameters		Hardness HB	Insert grade	Cutting parameters	
				Vc(m/min)	fz(mm/z)
P	Low-carbon steel、Soft steel	≤180	YBG302	150 (100-200)	0.15(0.1-0.3)
	High-carbon steel、Alloy steel	180-280	YBG302	120 (80-200)	0.15(0.1-0.3)
	Alloy tool steel	280-350	YBG302	100 (80-200)	0.15(0.1-0.3)
M	Stainless steel	≤270	YBG302	100 (80-200)	0.08(0.05-0.15)
K	Cast iron	180-250	YBG302	150 (100-250)	0.08(0.05-0.15)

Side and face milling tools


Machining of slot

SMP03 P M K

K-type coupling



Specification of tools

Type		Stock	Basic dimensions(mm)						Applicable inserts	Number of teeth Z	Type of coupling	Weight (kg)
			ØD	øc	ød	$a_e$max	a_p	H				
SMP03 Mounting by keyway	**-080×8-K27-MP06-10**	△	80	43	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	20	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	62	20	26		14	K	3.3

▲Stock available △Make-to-order

Spare parts

Diameter Ød	Inserts	Screw	Wrench	
				
Ø80-Ø125	MP06	I60M2.5x6.5	WT07IP	--
Ø125-Ø160	MP08	I60M3x7	WT09IP	--
Ø160-Ø200	MP12	I60M5x13	--	WT20IS

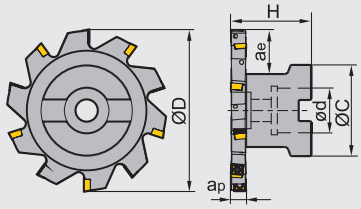
Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Side and face milling tools

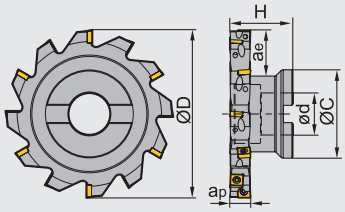
Machining of slot

SMP03 P M K

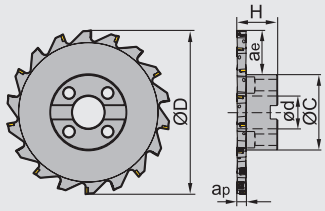
A-type coupling



B-type coupling



C-type coupling



Specification of tools

Type		Stock		Basic dimensions(mm)						Applicable inserts	Number of teeth Z	Type of coupling	Weight (kg)
		R	L	ØD	øc	ød	$a_e$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	33	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

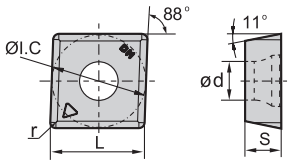
▲Stock available △Make-to-order

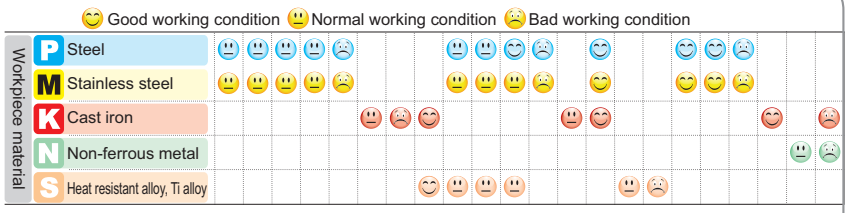
Spare parts

Diameter ØD	Inserts	Screw	Wrench	
				
Ø80-Ø125	MP06	I60M2.5×6.5	WT07IP	--
Ø125-Ø200	MP08	I60M3×7	WT09IP	--
Ø125-Ø200	MP12	I60M5×13	--	WT20IS

Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Selection of inserts





Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating								Cermet		Cemented carbide			
		ØI.C	L	S	ød	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	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												★										

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				Vc(m/min)	fz(mm/z)
P	Low-carbon steel、Soft steel	⩽180	YBG302	150 (100-200)	0.15(0.1-0.3)
P	High-carbon steel、Alloy steel	180-280	YBG302	120 (80-200)	0.15(0.1-0.3)
P	Alloy tool steel	280-350	YBG302	100 (80-200)	0.15(0.1-0.3)
M	Stainless steel	⩽270	YBG302	100 (80-200)	0.08(0.05-0.15)
K	Cast iron	180-250	YBG302	150 (100-250)	0.08(0.05-0.15)

SMP05 Slot milling

Groove Widths 1.1~4.8mm.
Maximum cutting depth 5mm.
Multi-function milling holder: slot milling,plunge milling, root cleaning

Slot milling specification code

Slot milling	Weldon shank	Insert	Teeth

SMP05 - 039×3.0 - XP 25 - QC 16- 03

Minimum machining diameter(mm)

Code	Diameter
25	25
39	39
44	44

Maximum cutting width(mm)

Code	Cutting width
3.0	3.0
4.8	4.8

Cutter diameter(mm)

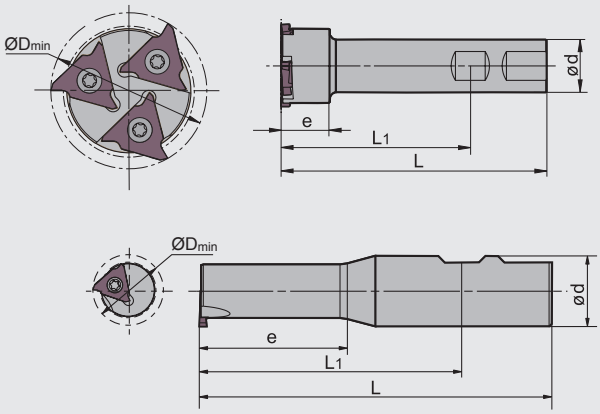
Code	Diameter
25	25
32	32

Cutting edge length code	Inscribed circuler(mm)
16	9.525
22	12.70

Side and face milling tools


Machining of slot

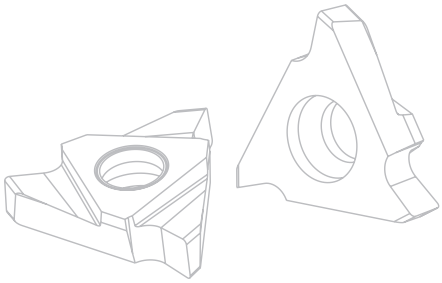
SMP05 P M K

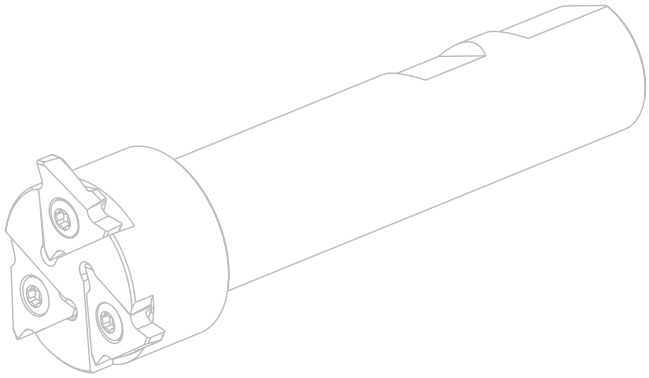


Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Applicable inserts	Width(mm)
			ØDmin	ød	e	L1	L			
SMP05	**-025×3.0-XP25-QC16-01**	△	25	25	40	89	125	1	QC16L 110~300	1.10-3.00
	-039×3.0-XP25-QC16-03	△	39	25	23	89	125	3	QC16L 110~300	1.10-3.00
	-044×4.8-XP25-QC22-03	△	44	25	23	89	125	3	QC22L 125~480	1.25-4.80

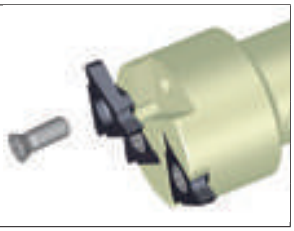
▲Stock available △Make-to-order





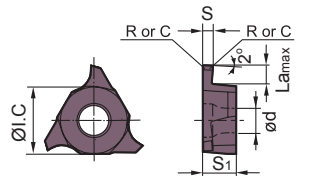
Spare parts

Diameter ØD	Screw	Wrench
Ø25	I60M3.5×10	WT15IP
Ø39	I60M3.5×10	WT15IP
Ø44	I60M5×13	WT20IP



Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Selection of inserts



Good working condition Normal working condition Bad working condition

Workpiece material	
P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

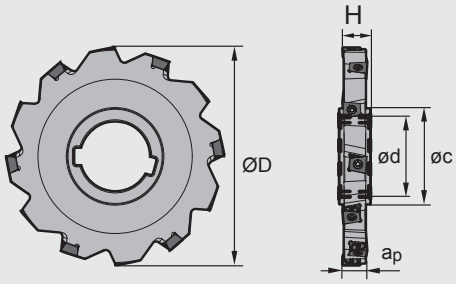
Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating								Cermet		Cemented carbide			
		$S_{\pm 0.025}$	La_{max}	R/C	ØI.C	S_1	ød	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	QC16L110-R01	1.10	2.00	R0.1	9.525	3.18	4.4									○	○												
	QC16L125-R02	1.25	2.00	R0.2	9.525	3.18	4.4									○	○												
	QC16L145-R02	1.45	2.00	R0.2	9.525	3.18	4.4									○	○												
	QC16L150-R02	1.50	2.00	R0.2	9.525	3.18	4.4									○	★												
	QC16L175-R02	1.75	2.00	R0.2	9.525	3.18	4.4									○	○												
	QC16L185-R02	1.85	2.50	R0.2	9.525	3.18	4.4									○	○												
	QC16L200-R02	2.00	2.50	R0.2	9.525	3.18	4.4									○	★												
	QC16L250-R02	2.50	2.50	R0.2	9.525	3.18	4.4									○	★												
	QC16L300-R02	3.00	3.00	R0.2	9.525	3.18	4.4									○	★												
	QC22L125-R02	1.25	2.00	R0.2	12.70	4.76	5.5									○	○												
	QC22L145-R02	1.45	2.00	R0.2	12.70	4.76	5.5									○	○												
	QC22L150-R02	1.50	3.50	R0.2	12.70	4.76	5.5									○	★												
	QC22L175-R02	1.75	3.50	R0.2	12.70	4.76	5.5									○	○												
	QC22L185-R02	1.85	3.50	R0.2	12.70	4.76	5.5									○	○												
	QC22L200-R02	2.00	3.50	R0.2	12.70	4.76	5.5									○	★												
	QC22L230-R02	2.30	3.50	R0.2	12.70	4.76	5.5									○	○												
	QC22L250-R03	2.50	4.00	R0.3	12.70	4.76	5.5									○	★												
	QC22L265-R03	2.65	4.00	R0.3	12.70	4.76	5.5									○	○												
	QC22L280-R03	2.80	4.00	R0.3	12.70	4.76	5.5									○	○												
	QC22L300-R03	3.00	4.00	R0.3	12.70	4.76	5.5									○	★												
	QC22L320-R03	3.20	4.00	R0.3	12.70	4.76	5.5									○	○												
	QC22L330-R03	3.30	4.00	R0.3	12.70	4.76	5.5									○	○												
	QC22L350-R03	3.50	5.00	R0.3	12.70	4.76	5.5									○	★												
	QC22L400-R04	4.00	5.00	R0.4	12.70	4.76	5.5									○	★												
	QC22L430-R04	4.30	5.00	R0.4	12.70	4.76	5.5									○	○												
	QC22L450-R04	4.50	5.00	R0.4	12.70	4.76	5.5									○	○												
	QC22L480-R04	4.80	5.00	R0.4	12.70	5.06	5.5									○	○												

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Side and face milling tools


Machining of slot

SMP09 P M K



K-type coupling

Specification of tools

Type		Stock	Basic dimensions(mm)						Applicable inserts	Number of teeth Z	Type of coupling	Weight (kg)
			ØD	ød	øc	H	ap	aemax				
SMP09	-080×10-K27-LN10-08	△	80	27	43	14	10	17	LNGX1005□□-GM	8	K	0.2
	-100×10-K32-LN10-10	△	100	32	47	14	10	25		10	K	0.37
	-125×10-K40-LN10-12	△	125	40	55	14	10	34		12	K	0.5
	-160×10-K40-LN10-14	△	160	40	62	14	10	47		14	K	1
	-200×10-K50-LN10-16	△	200	50	72	14	10	62		16	K	1.6
	-100×12-K32-LN14-08	△	100	32	47	16	12	25	LNGX1407□□-GM	8	K	0.4
	-125×12-K40-LN14-10	△	125	40	55	16	12	34		10	K	0.6
	-160×12-K40-LN14-12	△	160	40	62	16	12	47		12	K	1.1
	-200×12-K50-LN14-14	△	200	50	72	16	12	62		14	K	1.8
	-100×14-K32-LN10-10	△	100	32	47	18	14	25	LNGX1005□□-GM	10	K	0.4
	-125×14-K40-LN10-12	△	125	40	55	18	14	34		12	K	0.9
	-160×14-K40-LN10-14	△	160	40	62	18	14	47		14	K	1.6
	-200×14-K50-LN10-16	△	200	50	72	18	14	62		16	K	2.5
	-125×16-K40-LN10-12	△	125	40	55	20	16	34	LNGX1005□□-GM	12	K	1
	-160×16-K40-LN10-14	△	160	40	62	20	16	47		14	K	1.8
	-200×16-K50-LN10-16	△	200	50	72	20	16	62		16	K	2.9

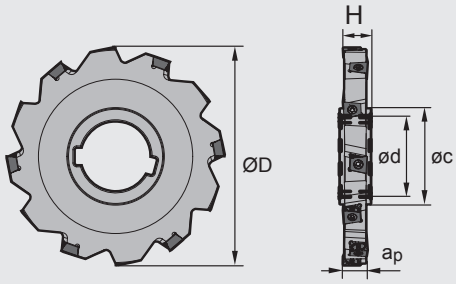
▲Stock available △Make-to-order

Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Side and face milling tools

Machining of slot

SMP09 P M K



K-type coupling

Specification of tools

Type		Stock	Basic dimensions(mm)						Applicable inserts	Number of teeth Z	Type of coupling	Weight (kg)
			ØD	ød	øc	H	a_p	$a_e$max				
SMP09	-125×18-K40-LN10-12	△	125	40	55	24	18	34	LNGX1005□□-GM	12	K	1.2
	-160×18-K40-LN10-14	△	160	40	62	24	18	47		14	K	2.1
	-200×18-K50-LN10-16	△	200	50	72	24	18	62		16	K	3.4
	-250×18-K50-LN10-18	△	250	50	80	24	18	83		18	K	5.5
	-125×20-K40-LN14-10	△	125	40	55	26	20	34	LNGX1407□□-GM	10	K	1.2
	-160×20-K40-LN14-12	△	160	40	62	26	20	47		12	K	2.1
	-200×20-K50-LN14-14	△	200	50	72	26	20	62		14	K	3.5
	-250×20-K50-LN14-16	△	250	50	80	26	20	83		16	K	5.8
	-160×25-K40-LN14-12	△	160	40	62	30	25	47	LNGX1407□□-GM	12	K	2.8
	-200×25-K50-LN14-14	△	200	50	72	30	25	62		14	K	4.5
	-250×25-K50-LN14-16	△	250	50	80	30	25	83		16	K	7.5

▲Stock available △Make-to-order

Spare parts

Diameter ØD	Edge width a_p	Inserts	Screw	Wrench
Ø80-Ø200	10	LNGX1005□□-GM	I60M3.5×8TT	WP10IS
Ø100-Ø200	12	LNGX1407□□-GM	I60M4×10	WP15IS
Ø100-Ø250	14-18	LNGX1005□□-GM	I60M3.5×8TT	WP10IS
Ø125-Ø315	20-25	LNGX1407□□-GM	I60M4×12	WP15IS

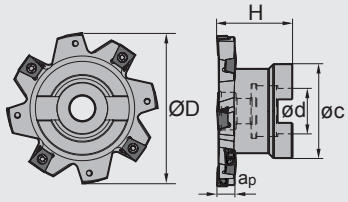
Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Side and face milling tools

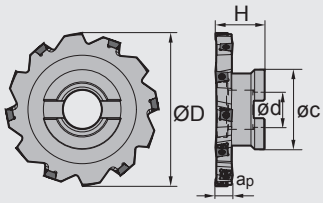

Machining of slot

SMP09 P M K

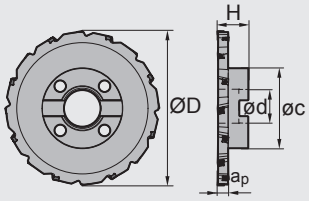
A-type coupling



B-type coupling



C-type coupling



Specification of tools

Type		Stock	Basic dimensions(mm)						Applicable inserts	Number of teeth Z	Type of coupling	Weight (kg)
			ØD	ød	øc	H	a_p	$a_e$max				
SMP09	**-080×10-A22-LN10-08**	△	80	22	45	40	10	20	LNGX1005□□-GM	8	A	0.4
	-100×10-B27-LN10-10	△	100	27	55	45	10	24		10	B	0.6
	-125×10-B32-LN10-12	△	125	32	65	45	10	33		12	B	1
	-160×10-B40-LN10-14	△	160	40	80	50	10	42		14	B	2
	-200×10-C40-LN10-16	△	200	40	92	50	10	53		16	C	2.9
	-100×12-B27-LN14-08	△	100	27	55	45	12	24	LNGX1407□□-GM	8	B	0.6
	-125×12-B32-LN14-10	△	125	32	65	45	12	33		10	B	1
	-160×12-B40-LN14-12	△	160	40	80	50	12	42		12	B	2.1
	-200×12-C40-LN14-14	△	200	40	92	50	12	53		14	C	2.9
	-100×14-B27-LN10-10	△	100	27	55	50	14	24	LNGX1005□□-G	10	B	0.7
	-125×14-B32-LN10-12	△	125	32	65	50	14	33		12	B	1.2
	-160×14-B40-LN10-14	△	160	40	80	50	14	42		14	B	2.4
	-200×14-C40-LN10-16	△	200	40	92	50	14	53		16	C	3.6
	-125×16-B32-LN10-12	△	125	32	65	50	16	33	LNGX1005□□-GM	12	B	1.4
	-160×16-B40-LN10-14	△	160	40	80	50	16	42		14	B	2.6
	-200×16-C40-LN10-16	△	200	40	92	50	16	53		16	C	4

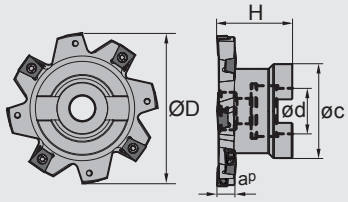
▲Stock available △Make-to-order

Side and face milling tools

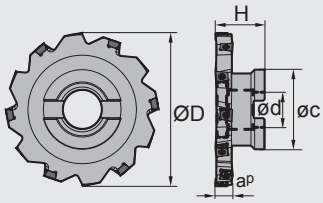

Machining of slot

SMP09 P M K

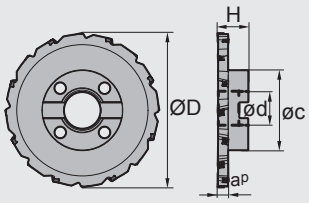
A-type coupling



B-type coupling



C-type coupling



Specification of tools

Type		Stock	Basic dimensions(mm)						Applicable inserts	Number of teeth Z	Type of coupling	Weight (kg)
			ØD	ød	øc	H	a_p	$a_e$max				
SMP09	-125×18-B32-LN10-12	△	125	32	65	50	18	33	LNGX1005□□-GM	12	B	1.5
	-160×18-B40-LN10-14	△	160	40	80	50	18	42		14	B	2.9
	-200×18-C40-LN10-16	△	200	40	92	50	18	53		16	C	4.3
	-250×18-C60-LN10-18	△	250	60	132	50	18	58		18	C	7.2
	-125×20-B32-LN14-10	△	125	32	65	50	20	33	LNGX1407□□-GM	10	B	1.6
	-160×20-B40-LN14-12	△	160	40	80	50	20	42		12	B	2.7
	-200×20-C40-LN14-14	△	200	40	92	50	20	53		14	C	4.6
	-250×20-C60-LN14-16	△	250	60	132	50	20	58		16	C	7.4
	-160×25-B40-LN14-12	△	160	40	80	50	25	42	LNGX1407□□-GM	12	B	3.2
	-200×25-C40-LN14-14	△	200	40	92	50	25	53		14	C	5.2
	-250×25-C60-LN14-16	△	250	60	132	50	25	58		16	C	8.6
	-315×25-C60-LN14-20	△	315	60	132	50	25	90		20	C	13.2

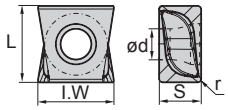
▲Stock available △Make-to-order

Spare parts

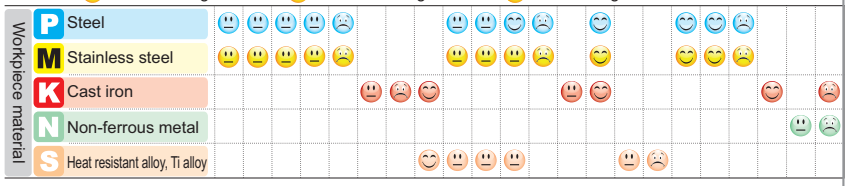
Diameter ØD	Edge width a_p	Inserts	Screw	Wrench
Ø80-Ø200	10	LNGX1005□□-GM	I60M3.5×8TT	WP10IS
Ø100-Ø200	12	LNGX1407□□-GM	I60M4×10	WP15IS
Ø100-Ø250	14-18	LNGX1005□□-GM	I60M3.5×8TT	WP10IS
Ø125-Ø315	20-25	LNGX1407□□-GM	I60M4×12	WP15IS

Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Selection of inserts



😊 Good working condition 😐 Normal working condition ☹ Bad working condition



Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating								Cermet		Cemented carbide			
		I.W	L	S	ød	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	LNGX100504-GM	9.9	10	5.5	4.1	0.4				●							●											
	LNGX100508-GM	9.9	10	5.5	4.1	0.8				●							●											
	LNGX100512-GM	9.9	10	5.5	4.1	1.2				●							●											
	LNGX100516-GM	9.9	10	5.5	4.1	1.6				●							●											
	LNGX100520-GM	9.9	10	5.5	4.1	2.0				●							●											
	LNGX100524-GM	9.9	10	5.5	4.1	2.4				●							●											
	LNGX100530-GM	9.9	10	5.5	4.1	3.0				●							●											
	LNGX100540-GM	9.9	10	5.5	4.1	4.0				●							●											
	LNGX140704-GM	13.4	14	7.5	4.4	0.4				●							●											
	LNGX140708-GM	13.4	14	7.5	4.4	0.8				●							●											
	LNGX140712-GM	13.4	14	7.5	4.4	1.2				●							●											
	LNGX140716-GM	13.4	14	7.5	4.4	1.6				●							●											
	LNGX140720-GM	13.4	14	7.5	4.4	2.0				●							●											
	LNGX140724-GM	13.4	14	7.5	4.4	2.4				●							●											
	LNGX140730-GM	13.4	14	7.5	4.4	3.0				●							●											
	LNGX140740-GM	13.4	14	7.5	4.4	4.0				●							●											
	LNGX140750-GM	13.4	14	7.5	4.4	5.0				●							●											

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

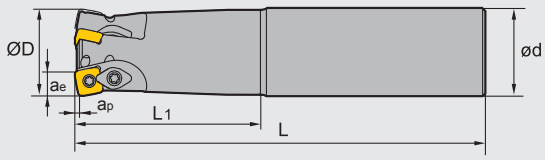
Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				Vc(m/min)	fz(mm/z)
P	Low-carbon steel、Soft steel	⩽ 180	YB9320 YBM253	150(100-200)	0.12(0.1-0.3)
P	High-carbon steel、Alloy steel	180-280	YB9320 YBM253	120(80-200)	0.12(0.1-0.3)
P	Alloy tool steel	280-350	YB9320 YBM253	100(80-200)	0.12(0.1-0.3)
M	Stainless steel	⩽ 270	YB9320 YBM253	100(80-200)	0.08(0.05-0.15)
K	Cast iron、Ductile iron、 High nickel cast iron	180-250	YB9320 YBM253	150(100-250)	0.08(0.05-0.15)

High feed milling cutters

XMR01 P M K S

S-type insert, straight shank



Specification of tools

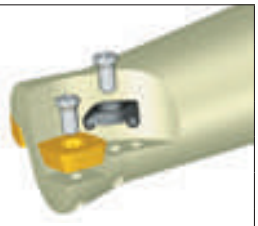
Type		Stock	Basic dimensions(mm)						Number of teeth Z	Weight (kg)
			ØD	a_p	a_e	L_1	L	ød		
XMR01	-020-G20-SD06-02	▲	20	0.8	4.45	50	130	20	2	0.26
	-020-G20-SD06-02CL	△	20	0.8	4.45	100	180	20	2	0.364
	-020-G20-SD06-02CXL	△	20	0.8	4.45	130	250	20	2	0.522
	-025-G25-SD06-03	▲	25	0.8	4.45	60	140	25	3	0.46
	-025-G25-SD06-03CL	△	25	0.8	4.45	120	200	25	3	0.670
	-025-G25-SD06-03CXL	△	25	0.8	4.45	130	250	25	3	0.850
	-025-G25-SD09-02	▲	25	1.4	6.88	60	140	25	2	0.5
	-025-G25-SD09-02CL	△	25	1.4	6.88	120	200	25	2	0.636
	-025-G25-SD09-02CXL	△	25	1.4	6.88	180	300	25	3	0.980
	-032-G32-SD09-03	▲	32	1.4	6.88	90	150	32	3	0.8
	-032-G32-SD09-03CL	△	32	1.4	6.88	120	200	32	3	1.006
	-032-G32-SD09-03CXL	△	32	1.4	6.88	180	300	32	3	1.551
	-035-G32-SD09-03	▲	35	1.4	6.88	70	150	32	3	0.8
	-035-G32-SD09-03CL	△	35	1.4	6.88	120	200	32	3	1.037
	-035-G32-SD09-03CXL	△	35	1.4	6.88	180	300	32	3	1.582
	-032-G32-SD12-02	▲	32	1.8	8.77	90	150	32	2	0.8
	-032-G32-SD12-02CL	△	32	1.8	8.77	120	200	32	2	1.002
	-032-G32-SD12-02CXL	△	32	1.8	8.77	180	300	32	2	1.547
	-040-G40-SD12-03	▲	40	1.8	8.77	70	150	40	3	1.3
	-040-G40-SD12-03CL	△	40	1.8	8.77	70	250	40	3	2.118
	-040-G40-SD12-03CXL	△	40	1.8	8.77	70	300	40	3	2.579
	-040-G40-SD15-02	▲	40	2.2	11.7	70	200	40	2	1.6
	-040-G40-SD15-02CL	△	40	2.2	11.7	70	250	40	2	2.061
	-040-G40-SD15-02CXL	△	40	2.2	11.7	70	300	40	2	3.522

▲Stock available △Make-to-order

XMR01-020-G20-SD06QL-02CL/CXL
Standard toolholder sery — Long sery — Extended sery

Spare parts

Tool type	Screw	Clamp Screw	Clamp	Wrench	
XMR01□□-SD06□□	I60M2.2×5.5	--	--	WT07IP	--
XMR01□□-SD09□□	I60M3.5×08TT	I60M4×8.4	WD-204	WT10IP	WT15IP
XMR01□□-SD12□□	I60M4×8.4			WT15IP	
XMR01□□-SD15□□	I60M5×13		WD-208	WT20IP	--

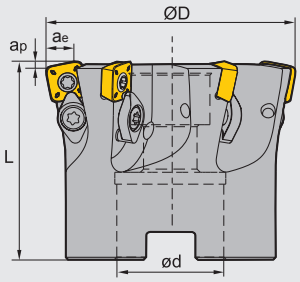


Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

High feed milling cutters

XMR01 P M K S

S type insert milling cutter



Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
			ØD	ap	ae	L	ød			
XMR01	**-050-A22-SD06-07C**	▲	50	0.8	5.8	40	22	7	A	0.36
	-063-A22-SD06-10C	▲	63	0.8	5.8	40	22	10	A	0.53
	-063-A27-SD06-10C	▲	63	0.8	5.8	50	27	10	A	0.57
	-050-A22-SD09-04C	▲	50	1.4	8.8	40	22	4	A	0.3
	-063-A22-SD09-06C	▲	63	1.4	8.8	40	22	6	A	0.5
	-063-A27-SD09-06C	▲	63	1.4	8.8	50	27	6	A	0.6
	-063-A22-SD12-05C	▲	63	1.8	11.7	40	22	5	A	0.5
	-063-A27-SD12-05C	▲	63	1.8	11.7	50	27	5	A	0.6
	-080-A27-SD12-05C	▲	80	1.8	11.7	50	27	5	A	0.9
	-100-B32-SD12-06	▲	100	1.8	11.7	50	32	6	B	1.8
	-080-A27-SD15-05C	▲	80	2.2	14	50	27	5	A	0.78
	-080-A32-SD15-05	▲	80	2.2	14	50	32	5	A	0.72
	-100-B32-SD15-07	▲	100	2.2	14	50	32	7	B	1.2
	-125-B40-SD15-09	▲	125	2.2	14	63	40	9	B	2.9
	-160-B40-SD15-12	▲	160	2.2	14	63	40	12	B	4.4

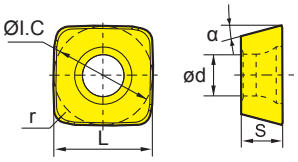
▲Stock available △Make-to-order

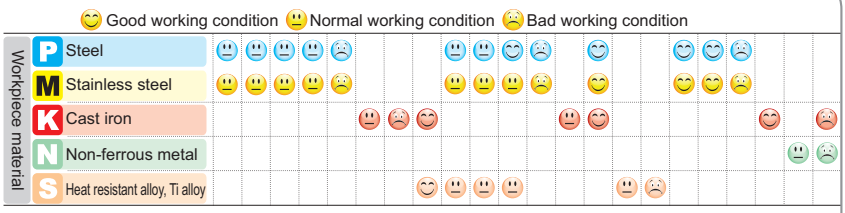
Spare parts

Tool type	Screw	Clamp Screw	Clamp	Wrench	
XMR01□□-SD06□□	I60M2.2×5.5	--	--	WT07IP	--
XMR01□□-SD09□□	I60M3.5×08TT	I60M4×8.4	WD-204	WT10IP	WT15IP
XMR01□□-SD12□□	I60M4×8.4			WT15IP	
XMR01□□-SD15□□	I60M5×13		WD-208	WT20IP	--

Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Selection of inserts





Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating									Cermet		Cemented carbide			
		ØI.C	L	r	S	ød	α	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**SDMT06T208-DM**	6.35	6.35	0.8	2.58	2.5	15°		★			★						●	○				●						
	SDMT09T312-DM	9.525	9.525	1.2	3.97	4.0	15°		★			★						●	○										
	SDMT120412-DM	12.7	12.7	1.2	4.76	4.4	15°		★			★					★	●	○										
	SDMT150520-DM	15.875	15.875	2.0	5.56	5.5	15°		★			★					●	●	○										
	**SDMT06T208-PM**	6.35	6.35	0.8	2.58	2.5	15°		★		○						●						●						
	SDMT09T312-PM	9.525	9.525	1.2	3.97	4.0	15°		★		●						●												
	SDMT120412-PM	12.7	12.7	1.2	4.76	4.4	15°		★		●						●												
	SDMT150520-PM	15.875	15.875	2.0	5.56	5.5	15°		★		●						●												
	**SDMT06T208-NM**	6.35	6.35	0.8	2.58	2.5	15°				●												●						
	SDMT09T312-NM	9.525	9.525	1.2	3.97	4.0	15°				○											○	○						
	SDMT120412-NM	12.7	12.7	1.2	4.76	4.4	15°				○							○				○	○						
	SDMT150520-NM	15.875	15.875	2.0	5.56	5.5	15°				●							●					●						

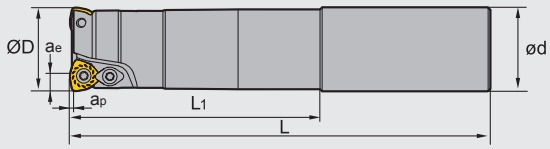
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Chipbreaker introduction:
-PM chipbreaker has sharp cutting edge, it is more suitable for machining with power shortage and for relatively adhesive materials, such as stainless steel and Ti alloy, etc.
-DM chipbreaker has blunt cutting edge and is relatively suitable for machining of hard materials such as hardened steel and cast iron, etc.

High feed milling cutters

XMR01 P M K

W-type insert, straight shank



Specification of tools

Type		Stock	Basic dimensions(mm)						Number of teeth Z	Weight (kg)
			ØD	a_p	a_e	L_1	L	ød		
XMR01	-020-G20-WP05-02-M	△	20	1.5	3.8	50	130	20	2	0.2
	-020-G20-WP05-02-L	△	20	1.5	3.8	100	180	20	2	0.3
	-020-G20-WP05-02-XL	△	20	1.5	3.8	130	250	20	2	0.8
	-025-G25-WP06-02-M	△	25	1.5	4.35	60	140	25	2	0.4
	-025-G25-WP06-02-L	△	25	1.5	4.35	120	200	25	2	0.6
	-025-G25-WP06-02-XL	△	25	1.5	4.35	180	300	25	2	1.0
	-032-G32-WP06-03-M	△	32	1.5	4.35	70	150	32	3	0.8
	-032-G32-WP06-03-L	△	32	1.5	4.35	120	200	32	3	1.0
	-032-G32-WP06-03-XL	△	32	1.5	4.35	180	300	32	3	1.6
	-040-G32-WP06-03-M	△	40	1.5	4.35	50	150	32	3	0.9
	-040-G32-WP06-03-L	△	40	1.5	4.35	50	250	32	3	1.5
	-040-G32-WP06-03-XL	△	40	1.5	4.35	50	300	32	3	1.8
	-040-G32-WP08-02-M	△	40	1.5	5.66	50	150	32	2	0.9
	-040-G32-WP08-02-L	△	40	1.5	5.66	50	250	32	2	1.5
	-040-G32-WP08-02-XL	△	40	1.5	5.66	50	300	32	2	1.9
	-050-G32-WP09-02-M	△	50	3.0	6.8	50	150	32	2	1.9
	-050-G32-WP09-02-L	△	50	3.0	6.8	50	250	32	2	2.5

▲Stock available △Make-to-order

Spare parts

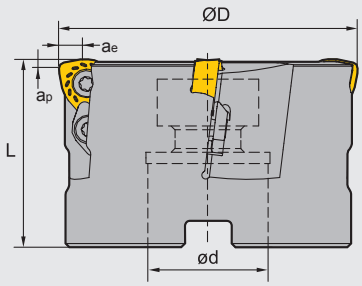
Tool type	Clamp/Insert screw	Clamp	Wrench	
				
XMR01□□-WP05□□	I60M3.5×6.5	--	WT10P	--
XMR01□□-WP06□□	I60M4×8.4		WT15P	
XMR01□□-WP08□□	I60M5×13	WD-208	--	WT20IT
XMR01□□-WP09□□				

Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

High feed milling cutters

XMR01 P M K

W-type insert, arbor mounting



Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
			ØD	a_p	a_e	L	ød			
XMR01	**-050-A22-WP06-04**	△	50	1.5	4.35	40	22	4	A	0.4
	-050-A22-WP08-03	△	50	1.5	5.66	50	22	3	A	0.4
	-063-A22-WP08-04C	△	63	1.5	5.66	50	22	4	A	0.7
	-063-A27-WP08-04C	△	63	1.5	5.66	50	27	4	A	0.7
	-080-A27-WP08-05C	△	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-WP09-03C	△	63	3.0	6.8	50	22	3	A	0.7
	-080-A27-WP09-04C	△	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

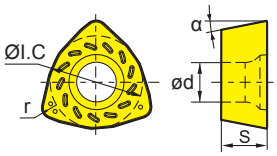
▲Stock available △Make-to-order

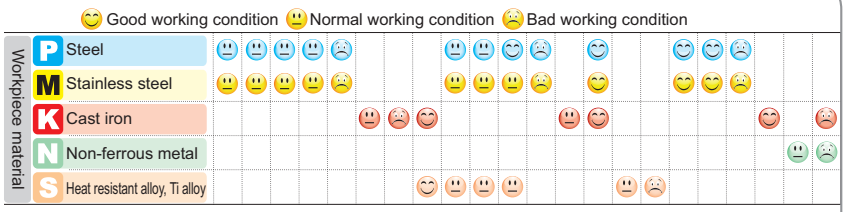
Spare parts

Tool type	Clamp/Insert screw	Clamp	Wrench	
				
XMR01□□-WP06□□	I60M4×8.4	--	WT15S	--
XMR01□□-WP08□□	I60M5×13	WD-208	--	WT20IT
XMR01□□-WP09□□	I60M5×13	WD-208	--	

Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Selection of inserts



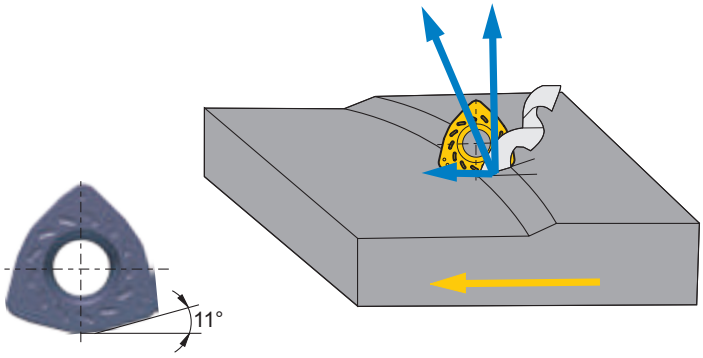


Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating								Cermet		Cemented carbide			
		ØI.C	r	S	ød	α	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	WPGT050315ZSR	7.94	1.5	3.5	4.0	11°		★		●	●																	
	WPGT060415ZSR	9.525	1.5	4.2	4.4	11°		★		●	●					●												
	WPGT080615ZSR	12.85	1.5	6.35	5.5	11°		★		●	●					●												
	WPGT090725ZSR	15.00	2.5	7	5.5	11°		★		●	●					●												
	WPGT050315ZSR-PM	7.94	1.5	3.5	4.0	11°		★			●					●												
	WPGT060415ZSR-PM	9.525	1.5	4.2	4.4	11°		★			●					●					○							
	WPGT080615ZSR-PM	12.85	1.5	6.35	5.5	11°		★			●					●					○							
	WPGT090725ZSR-PM	15.00	2.5	7.00	5.5	11°		★			●					●												

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Chipbreaker introduction:
-PM chipbreaker has sharp cutting edge, it is more suitable for machining with power shortage and for relatively adhesive materials, such as stainless steel and Ti alloy, etc.
General chipbreaker has blunt cutting edge and is relatively suitable for machining of hard materials such as hardened steel and cast iron, etc.

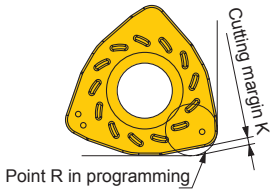
XMR01 series milling tools

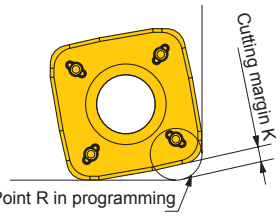


The main feature of high feed tools is to resolve the major cutting force to the axial direction, greatly reducing the radial cutting force, thus improve tool's vibration resistance. In addition, this structure can effectively reduce vibration in long-overhang milling operation.

Approximate R in machining program

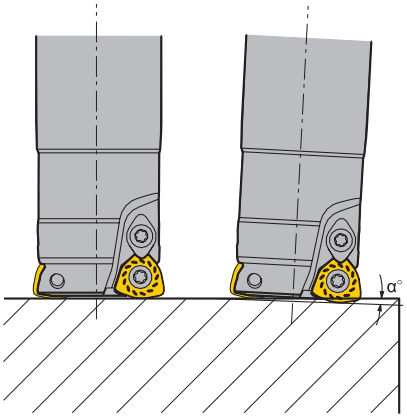
Applicable insert	Approximate R(mm)	Cutting margin K(mm)
WPGT050315ZSR/-PM	2	0.5
WPGT060415ZSR/-PM	2.5	0.7
WPGT080615ZSR/-PM	2.5	0.7
WPGT090725ZSR/-PM	4.5	1.2
SDMT06T208-DM/-PM/NM	1.6	0.5
SDMT09T312-DM/-PM/NM	2.5	0.87
SDMT120412-DM/-PM/NM	4.0	0.93
SDMT150520-DM/-PM/NM	4.0	1.38



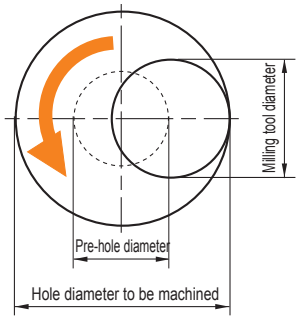


Different machining styles

■ Ramp machining



■ Helical interpolation milling



- 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 chips may fly off in drilling operation.
- The cutting depth of each rotation must not exceed the maximum cutting depth (a_p).
- The S-type insert can be used for plunge milling in addition to the machining operations mentioned above.

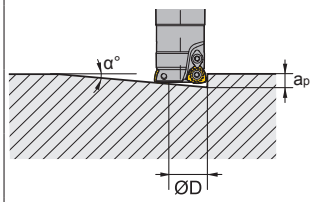
Selection guide for XMR01 series

XMR01 series tools (with SD□□ inserts) have perfect edge strength and good economical efficiency, advantageous in face milling.

XMR01 series tools (with WP□□ inserts) has good capability of chip removal, proficient in cavity milling.

Ramp milling, helical interpolation milling

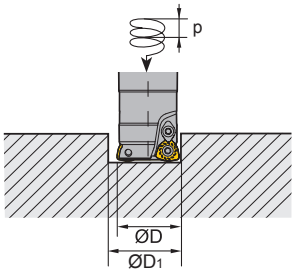
● Ramp milling



$$L_m = \frac{a_p}{\tan\alpha}$$

α:Plunge angle

● Helical interpolation milling



$$P = \tan\alpha \times \pi \times D_1$$

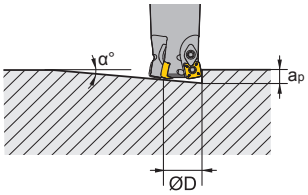
α:Helix angle

Insert	Diameter ØD(mm)	Ramp milling		Helical interpolationmilling	
		Max.cutting depth a_p(mm)	Max.plunge angle α°	Min.diameter $ØD_1$(mm)	Max.diameter (mm)
WP**05**	20	1.5	12	24	37
WP**06*	25	1.5	8.8	31	47
	32	1.5	5	45	61
	40	1.5	3.2	61	77
	50	1.5	2.8	81	97
WP**08*	40	1.5	9	52	77
	50	1.5	5.4	71	97
	63	1.5	4.3	97	123
	80	1.5	2.9	131	157
	100	1.5	2.1	171	197
	125	1.5	1.3	221	247
	160	1.5	1.1	291	317
WP**09*	50	3.0	7.2	70	96
	63	3.0	4.5	96	122
	80	3.0	2.8	130	156
	100	3.0	2.2	170	196
	125	3.0	1.6	220	246
	160	3.0	1.2	290	316

Reduce the feed rate when plunging and circular milling.
For drilling operations (axial) set the feed rate under 0.2mm.
"Attention"—drilling can produce long chips.

Ramp milling, helical interpolation milling

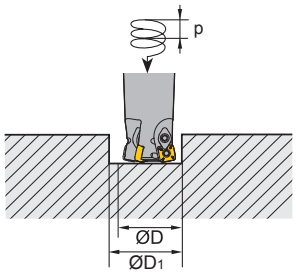
● Ramp milling



$$L_m = \frac{a_p}{\tan\alpha}$$

α:Plunge angle

● Helical interpolation milling



$$P = \tan\alpha \times \pi \times D_1$$

α:Helix angle

Insert	Diameter ØD(mm)	Ramp milling		Helical interpolationmilling	
		max.cutting depth a_p(mm)	max.cutting depth α°	min.diameter $ØD_1$(mm)	max. diameter(mm)
SD**06**	20	0.8	3.6	30	38
	25	0.8	2.8	40	48
	32	0.8	1.6	52	60
	40	0.8	1.1	70	78
	50	0.8	0.8	90	98
	63	0.8	0.7	114	122
SD**09**	25	1.4	6.5	34	48
	32	1.4	4.5	48	62
	35	1.4	3.6	54	68
	50	1.4	1.8	84	98
	63	1.4	1.3	110	124
SD**12**	32	1.8	10.4	44	60
	40	1.8	5.7	60	76
	50	1.8	3.5	80	96
	63	1.8	2.5	106	122
	80	1.8	1.6	140	156
	100	1.8	1.2	180	196
SD**15**	40	2.2	7.3	54	76
	80	2.2	1.4	134	156
	100	2.2	1.0	174	196
	125	2.2	0.9	234	246
	160	2.2	0.6	304	316

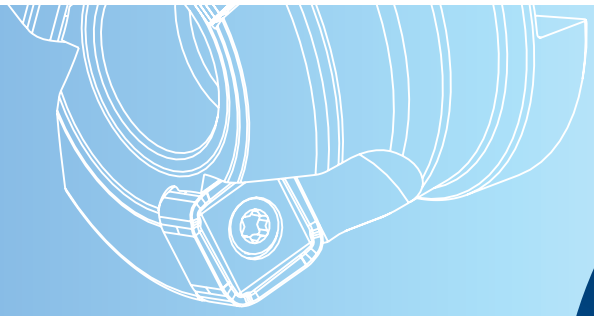
Reduce the feed rate when plunging and circular milling.
For drilling operations (axial) set the feed rate under 0.2mm.
"Attention"—drilling can produce long chips.

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting speed (m/min)	Ø25		Ø30/32/35	
					Axial cutting depth	Feed rate per tooth	Axial cutting depth	Feed rate per tooth
P	Soft steel Carbon Steel	≤HB180 HB180-280	YBC302 YBM351 YBM253 YBG205 YB9320	170(120-220) 150(100-200)	0.6~1.5	0.6~1.2	0.6~1.2	0.5~1.4
P	Alloy steel Alloy tool steel	HB280-350	YBC302 YBM351 YBM253 YBG205 YB9320	130(80-180)	0.4~1.2	0.6~1.2	0.4~1.0	0.5~1.4
P	pre-hardened steel	≤HRC35	YBC302 YBM351 YBM253 YBG205 YB9320	120(80-160)	0.4~1.0	0.5~1.0	0.4~1.0	0.5~1.0
M	Stainless steel	≤HB270	YBM351 YBM253	120(80-160)	0.6~1.0	0.6~1.0	0.8~1.2	0.8~1.2
			YBG205 YB9320	120(80-190)				
K	Common cast iron	Tensile strength ≤350MPa	YBG302	150(100-200)	0.6~1.0	0.6~1.4	0.6~1.2	0.6~1.6
K	Nodular cast iron	Tensile strength ≤800MPa	YBG302	120(80-160)	0.4~0.8	0.5~1.2	0.4~1.0	0.5~1.4
S	Difficult-to-machine materials	≤400	YBS203	80(60-120)	0.6~1.0	0.6~1.0	0.8~1.2	0.8~1.2
			YBS303	60(45-110)	0.4~0.8	0.4~0.8	0.4~1.0	0.4~0.8

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting speed (m/min)	Ø40		Ø50/63		Ø80/100	
					Axial cutting depth	Feed rate per tooth	Axial cutting depth	Feed rate per tooth	Axial cutting depth	Feed rate per tooth
P	Soft steel Carbon Steel	≤HB180 HB180-280	YBC302 YBM351 YBM253 YBG205 YB9320	170(120-220) 150(100-200)	0.6~1.5	0.8~1.5	0.6~1.5	0.8~1.5	0.6~1.5	0.5~1.5
P	Alloy steel Alloy tool steel	HB280-350	YBC302 YBM351 YBM253 YBG205 YB9320	130(80-180)	0.4~1.2	0.6~1.5	0.4~1.3	0.6~1.5	0.4~1.3	0.5~1.5
P	pre-hardened steel	≤HRC35	YBC302 YBM351 YBM253 YBG205 YB9320	120(80-160)	0.4~1.0	0.5~1.0	0.4~1.3	0.5~1.0	0.4~1.3	0.5~1.0
M	Stainless steel	≤HB270	YBM351 YBM253	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
			YBG205 YB9320	120(80-190)						
K	Common cast iron	Tensile strength ≤350MPa	YBG302	150(100-200)	0.6~1.5	0.8~1.6	0.6~1.5	0.8~1.7	0.6~1.5	0.6~1.7
K	Nodular cast iron	Tensile strength ≤800MPa	YBG302	120(80-160)	0.4~1.2	0.6~1.4	0.6~1.3	0.6~1.5	0.4~1.3	0.5~1.5
S	Difficult-to-machine materials	≤400	YBS203	80(60-120)	0.8~1.2	0.6~1.0	1.1~1.5	0.6~1.2	1.0~1.5	0.4~1.2
			YBS303	60(45-110)	0.4~1.0	0.4~1.0	0.6~1.2	0.6~1.0	0.4~1.0	0.4~0.8



After reasonable calculation and optimization, the axial and radial inclination angles effectively reduce the machining resistance of the tool.

The whole cutting tool can realize stable processing with excellent impact resistance and strong vibration resistance.

Screw clamping achieves high positioning accuracy and good economy.

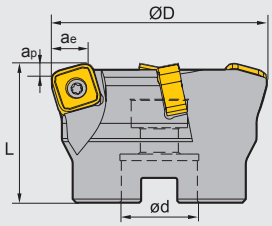
XMR03 Series of High Feed Milling Cutter

1. 8 cutting edges on both sides achieve economical and cost-effective machining.
2. Large rake angle design, low cutting resistance, special edge shape and tool combination achieve a large chip space, leading to excellent chip removal performance.
3. Due to the good versatility, it can be used for large-feed processing of various steels, as well as processing viscous materials such as stainless steel and titanium alloy.
4. 4×2=8 cutting edges

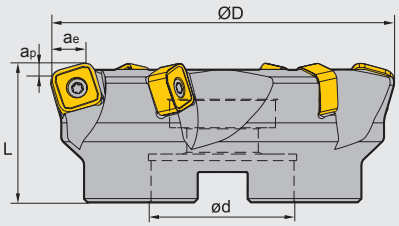
High feed milling cutters

XMR03 P M

A-type coupling



B-type coupling



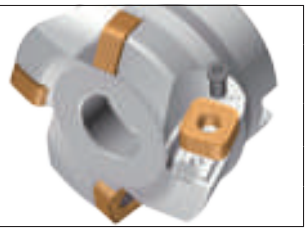
Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
			ØD	a_{pmax}	a_e	L	ød			
XMR03 Coarse pitch	**-050-A22-SN12-03**	▲	50	1.8	9.8	40	22	3	A	0.289
	-063-A22-SN12-04	▲	63	1.8	9.8	40	22	4	A	0.482
	-080-A27-SN12-05	▲	80	1.8	9.8	50	27	5	A	1.014
	-100-B32-SN12-06	▲	100	1.8	9.8	50	32	6	B	1.45
	-125-B40-SN12-07	▲	125	1.8	9.8	63	40	7	B	2.7
Close pitch	**-050-A22-SN12-04**	△	50	1.8	9.8	40	22	4	A	0.319
	-063-A22-SN12-05	△	63	1.8	9.8	40	22	5	A	0.512
	-080-A27-SN12-06	△	80	1.8	9.8	50	27	6	A	1.044
	-100-B32-SN12-07	△	100	1.8	9.8	50	32	7	B	1.48
	-125-B40-SN12-08	△	125	1.8	9.8	63	40	8	B	2.73
Extra close pitch	**-050-A22-SN12-05**	△	50	1.8	9.8	40	22	5	A	0.354
	-063-A22-SN12-06	△	63	1.8	9.8	40	22	6	A	0.547
	-080-A27-SN12-07	△	80	1.8	9.8	50	27	7	A	1.079
	-100-B32-SN12-08	△	100	1.8	9.8	50	32	8	B	1.435
	-125-B40-SN12-09	△	125	1.8	9.8	63	40	9	B	2.765

▲Stock available △Make-to-order

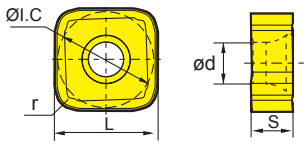
Spare parts

Tool type	Insert screw	Wrench
		
XMR03□□-SD12□□	I60M4×10	WT15IP

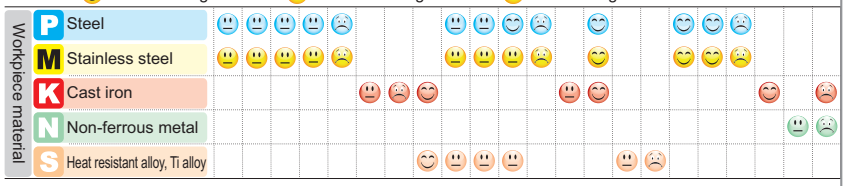


Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Selection of inserts



Good working condition Normal working condition Bad working condition



Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	ØI.C	r	S	ød	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SNGU120620-GM	12.7	12.7	2.0	5.6	4.4				●						●	●										

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting speed (m/min)	Ø50/63		Ø80/125	
					Axial cutting depth	Feed rate per tooth	Axial cutting depth	Feed rate per tooth
P	Soft steel, carbon steel	≤HB180 HB180-280	YB9320 YBM253 YBG205	170(120-220) 150(100-200)	0.6~1.5	0.5~1.5	0.6~1.5	0.6~1.5
P	Alloy steel, alloy tool steel	HB280-350	YB9320 YBM253 YBG205	130(80-180)	0.4~1.3	0.5~1.5	0.4~1.3	0.6~1.5
P	Pre-hardened steel	≤HRC35	YB9320 YBM253 YBG205	120(80-160)	0.4~1.3	0.5~1.0	0.4~1.3	0.5~1.0
M	Stainless steel	≤HB270	YBM253	120(80-160)	0.4~1.5	0.4~1.2	0.4~1.5	0.5~1.3
M	Stainless steel	≤HB270	YBG205 YB9320	120(80-190)	0.4~1.5	0.4~1.2	0.4~1.5	0.5~1.3

XMR03series milling cutter processing case

Workpiece：718H(HRC 34)

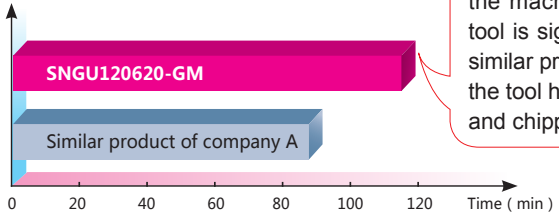
Toolholder：XMR03-050-A22-SN12-03

Insert：SNGU120620-GM/YB9320

Cutting parameter：

Vc=142m/min， fz=1.25mm/z，

ap=0.8mm



Under the same circumstances, the machining life of our XMR03 tool is significantly better than the similar product of company A , and the tool has better wear resistance and chipping resistance.

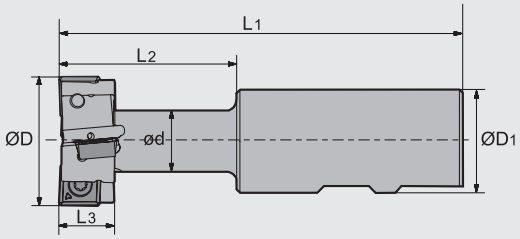
T-slot milling tools

Kr:90°


Machining T slot

TMP01 K

Weldon shank



Specification of tools

Type		Stock	Basic dimensions(mm)						Number of teeth Z	Number of insert	T-slot specification
			ØD	$ØD_1$	ød	L_1	L_2	L_3			
TMP01	**-021-XP25-MP06-01**	▲	21	25	10	100	32	9	1	2	12
	-025-XP25-MP06-01	▲	25	25	12	100	35	11	1	2	14
	-032-XP32-MP08-02	▲	32	32	15	110	45	14	2	4	18
	-040-XP32-MP12-02	▲	40	32	19	125	55	18	2	4	22
	-050-XP40-MP12-02	▲	50	40	25	140	65	22	2	4	28
	-060-XP50-MP12-02	▲	60	50	32	160	80	28	2	6	36

▲Stock available △Make-to-order

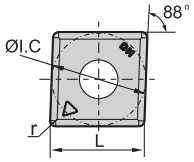
Spare parts

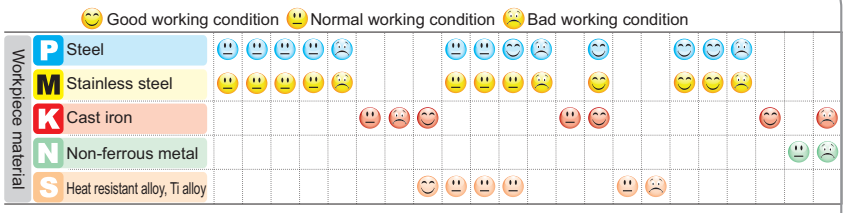
Tool type	Screw	Wrench	
			
TMP01-021-XP25-MP06-01	I60M2.5×5.5	WT07IP	--
TMP01-025-XP25-MP06-01	I60M2.5×5.5		
TMP01-032-XP32-MP08-02	I60M3×7	WT10IP	--
TMP01-040-XP32-MP12-02	I60M5×10	--	WT20IT
TMP01-050-XP40-MP12-02	I60M5×10		
TMP01-060-XP50-MP12-02	I60M5×10		

Caution: When installing inserts, make sure the insert nose marked with “DM” or “Δ” is pointing to the slot.

Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Selection of inserts

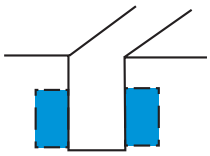




Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating								Cermet		Cemented carbide			
		ØI.C	L	s	ød	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**MPHT060304-DM**	6.35	6.35	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												★										

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

◆Workpiece before machining



Recommended cutting parameters

Workpiece material	Insert grade	Cutting parameters		
		Vc(m/min)	fz(mm/z)	Cooling
Grey cast iron	YBG302	80~160	0.05~0.2	Wet / Dry

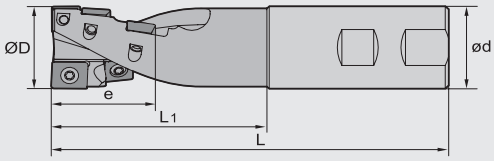
Helical milling

Kr:90°

Side milling Slot milling

HMP01 P K

Weldon shank



Specification of tools

Type		Stock		Basic dimensions(mm)					Number of flute Z	Number of inserts		Shank type
		R	L	ØD	ød	e	L_1	L		APKT 150412-PM/KM	SPMT 120408-PM/KM	
HMP01	**-040×55-XP40-SP12-02**	△	△	40	40	55	95	175	2	1	5	Weldon shank
	-050×55-XP40-SP12-04	△	△	50	40	55	95	175	4	2	10	Weldon shank

▲Stock available △Make-to-order

Spare parts

Diameter ØD	Screw	Wrench
		
Ø40	I60M5×10	WT20T
Ø50	I60M5×13	WT20T

Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

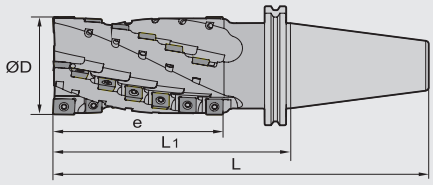
Helical milling

Kr:90°

Side milling Slot milling

HMP01 P K

JT shank/ BT shank (JT shank shown)



Specification of tools

Type		Stock		Basic dimensions(mm)				Teeth row	Number of inserts		Shank type
		R	L	ØD	e	L_1	L		APKT 150412-PM/KM	SPMT 120408-PM/KM	
HMP01	-050×84-JT50-SP12-04	△	△	50	84	145	246.75	4	2	16	JT
	-063×74-JT50-SP12-04	△	△	63	74	135	236.75	4	2	14	JT
	-063×104-JT50-SP12-04	△	△	63	104	165	266.75	4	2	20	JT
	-063×134-JT50-SP12-04	△	△	63	134	195	296.75	4	2	26	JT
	-080×104-JT50-SP12-04	△	△	80	104	165	266.75	4	2	20	JT
	-080×144-JT50-SP12-04	△	△	80	144	205	306.75	4	2	28	JT
	-050×84-BT50-SP12-04	△	△	50	84	145	246.8	4	2	16	BT
	-063×74-BT50-SP12-04	△	△	63	74	135	236.8	4	2	14	BT
	-063×104-BT50-SP12-04	△	△	63	104	165	266.8	4	2	20	BT
	-063×134-BT50-SP12-04	△	△	63	134	195	296.8	4	2	26	BT
	-080×104-BT50-SP12-04	△	△	80	104	165	266.8	4	2	20	BT
	-080×144-BT50-SP12-04	△	△	80	144	205	306.8	4	2	28	BT

▲Stock available △Make-to-order

Spare parts

Diameter ØD	Screw	Wrench
Ø50	I60M5×13	WT20IS
Ø63	I60M5×13	WT20IS
Ø80	I60M5×13	WT20IS

Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

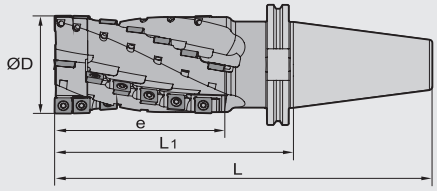
Helical milling

Kr:90°

Side milling Slot milling

HMP01 EC P K

JT shank/ BT shank (JT shank shown)



Specification of tools

Type		Stock		Basic dimensions(mm)				Teeth row	Number of inserts		Shank type
		R	L	ØD	e	L1	L		APKT 150412-PM/KM	SPMT 120408-PM/KM	
HMP01	**-050×84EC-JT50-SP12-04**	△	△	50	84	145	246.75	4	2	16	JT
	-063×74EC-JT50-SP12-04	△	△	63	74	135	236.75	4	2	14	JT
	-063×104EC-JT50-SP12-04	△	△	63	104	165	266.75	4	2	20	JT
	-063×134EC-JT50-SP12-04	△	△	63	134	195	296.75	4	2	26	JT
	-080×104EC-JT50-SP12-04	△	△	80	104	165	266.75	4	2	20	JT
	-080×144EC-JT50-SP12-04	△	△	80	144	205	306.75	4	2	28	JT
	-050×84EC-BT50-SP12-04	△	△	50	84	145	246.8	4	2	16	BT
	-063×74EC-BT50-SP12-04	△	△	63	74	135	236.8	4	2	14	BT
	-063×104EC-BT50-SP12-04	△	△	63	104	165	266.8	4	2	20	BT
	-063×134EC-BT50-SP12-04	△	△	63	134	195	296.8	4	2	26	BT
	-080×104EC-BT50-SP12-04	△	△	80	104	165	266.8	4	2	20	BT
	-080×144EC-BT50-SP12-04	△	△	80	144	205	306.8	4	2	28	BT

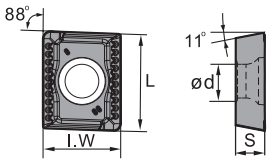
▲Stock available △Make-to-order

Spare parts

Diameter ØD	Insert screw	Screw of interchangeable head	Wrench of insert screw	Wrench of interchangeable head	Interchangeable head
Ø50	I60M5×13	M10×50	WT20IS	WH80L	050EC
Ø63	I60M5×13	M10×50	WT20IS	WH80L	063EC
Ø80	I60M5×13	M12×55	WT20IS	WH100L	080EC

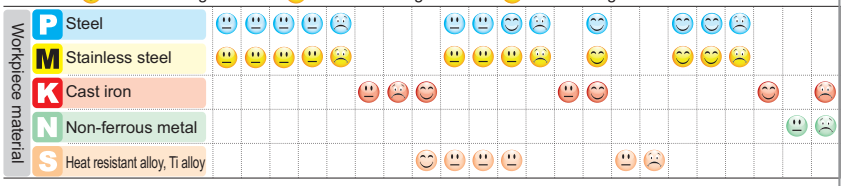
Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Selection of inserts



Good working condition Normal working condition Bad working condition

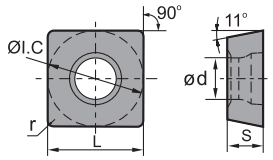
Workpiece material



Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	I.W	S	ød	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	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												●	○								

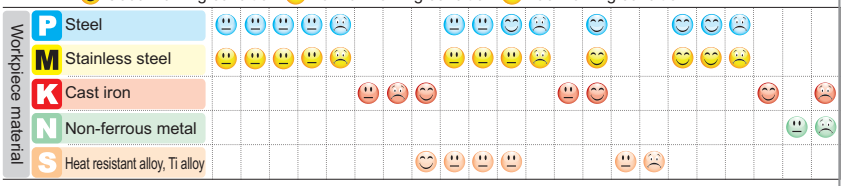
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Selection of inserts



Good working condition Normal working condition Bad working condition

Workpiece material



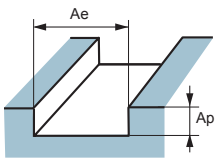
Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	ØI.C	S	ød	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**SPMT120408-PM**	12.7	12.7	4.76	5.5	0.8				★								●									
	SPMT120408-KM	12.7	12.7	4.76	5.5	0.8												●	○								

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Chipbreaker selection for HMP01 milling inserts

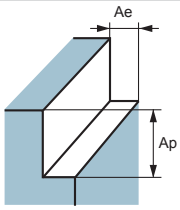
Classification \ Function	For semi-finishing	For roughing
P	-PM	-PM
K	-KM	-KM

A Slot milling



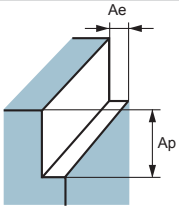
Ae=D
Ap=0.5D(cast iron)
Maximum 12mm(steel)

B Square shoulder milling



Ae=0.5D
Ap=1.5D(cast iron)
1.0D(steel)

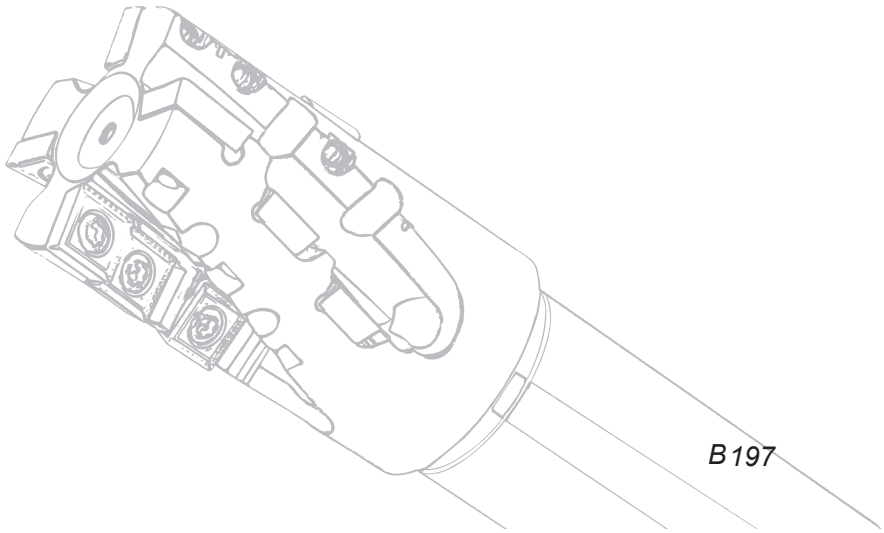
C Narrow shoulder milling



Ae=0.1D
Ap≤Maximum cutting length

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters		Operation (figure)
				Cutting speed(m/min)	Feed speed(mm/z)	
P	Low-carbon steel、Soft steel	⩽180	YBM253 YBG302	80(60-90)	0.25(0.1-0.35)	A
				90(70-120)	0.3(0.15-0.4)	B
				90(70-120)	0.3(0.15-0.4)	C
	High-carbon steel、Alloy steel	180-280	YBM253 YBG302	70(60-100)	0.2(0.1-0.35)	A
				80(60-120)	0.25(0.15-0.35)	B
				90(70-120)	0.25(0.15-0.35)	C
	Alloy tool steel	280-350	YBM253 YBG302	50(40-80)	0.15(0.08-0.25)	A
				60(50-100)	0.2(0.1-0.35)	B
				70(50-100)	0.2(0.1-0.35)	C
K	Cast iron	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



Chamfer milling

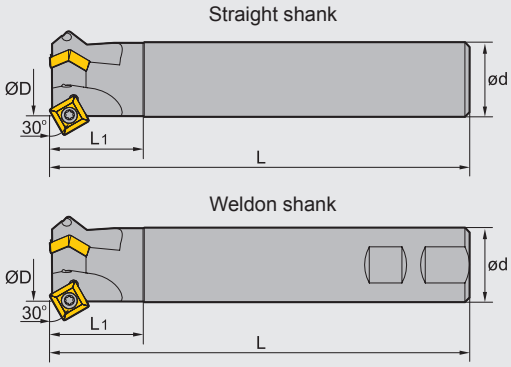
Kr:30°


Chamfering


Face milling


Hole stomata chamfer

CMZ01 P M K

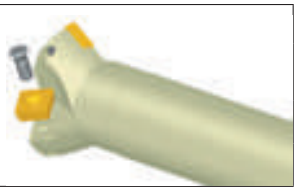


Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth Z	Weight (kg)
			ØD	ød	L	L_1		
CMZ01 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
Weldon shank	**-012-XP20-SP12-01**	△	12	20	100	40	1	0.2
	-025-XP25-SP12-02	△	25	25	120	40	2	0.6
	-032-XP32-SP12-03	△	32	32	180	40	3	1.0

▲Stock available △Make-to-order

Spare parts

Diameter ØD	Screw	Wrench	
			
Ø12-Ø32	I43M5×11	WT20IS	

Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Chamfer milling

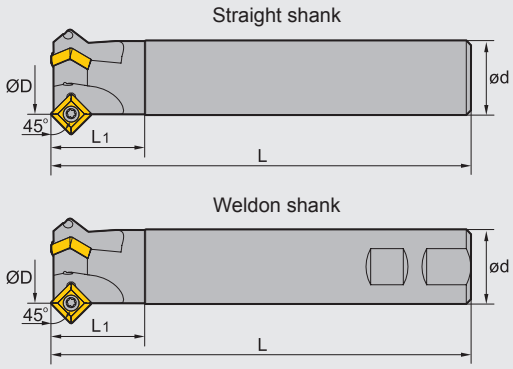
Kr:45°


Chamfering


Face milling


Hole stomata chamfer

CMA01 P M K

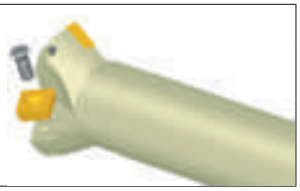


Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth Z	Weight (kg)
			ØD	ød	L	L_1		
CMA01 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
Weldon shank	**-012-XP20-SP12-01**	▲	12	20	100	40	1	0.2
	-025-XP25-SP12-02	▲	25	25	120	40	2	0.6
	-032-XP32-SP12-03	▲	32	32	180	40	3	1.0

▲Stock available △Make-to-order

Spare parts

Diameter ØD	Screw	Wrench	
			
Ø12-Ø32	I43M5×11	WT20IS	

Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Chamfer milling tools

Kr:60°

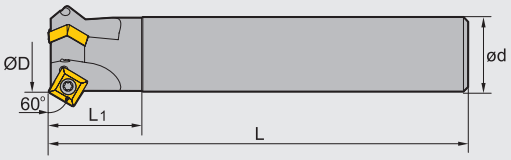

Chamfering


Face milling

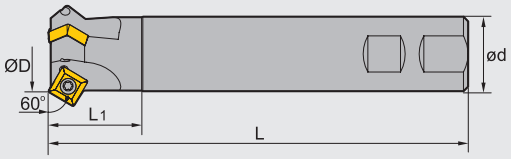

Hole stomata chamfer

CMD01 P M K

Straight shank



Weldon shank



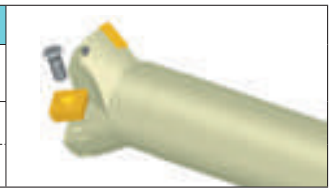
Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth Z	Weight (kg)
			ØD	ød	L	L_1		
CMD01 Straight shank	**-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
Straight shank	**-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

▲Stock available △Make-to-order

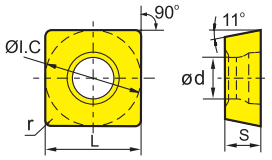
Spare parts

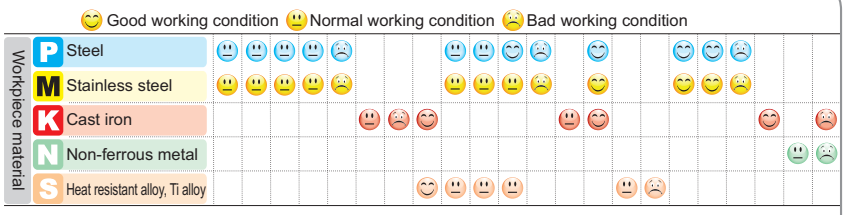
Diameter ØD	Screw	Wrench
		
Ø12-Ø36	I43M5×11	WT20IS



Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Selection of inserts





Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating								Cermet		Cemented carbide			
		ØI.C	L	r	S	ød	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**SPMT120408**	12.7	12.7	0.8	4.76	5.5	●		●		●							★							○			

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				Cutting speed(m/min)	Feed speed(mm/z)
P	Low-carbon steel、Soft steel	≤180	YBM251 YBC301	180(100-250)	0.25 (0.1-0.4)
			YBM351 YBG302	150(100-200)	0.3 (0.1-0.5)
			YC30S	120(80-150)	0.4 (0.1-0.5)
	High-carbon steel、Alloy steel	180-280	YBM251 YBC301	160(100-220)	0.3 (0.1-0.4)
			YBM351 YBG302	130(100-180)	0.3 (0.1-0.5)
			YC30S	100(60-150)	0.4 (0.1-0.5)
	Alloy tool steel	280-350	YBM251 YBC301	120(80-180)	0.3 (0.1-0.4)
			YBM351 YBG302	100(80-150)	0.3 (0.1-0.5)
			YC30S	80(60-120)	0.4 (0.1-0.5)
M	Stainless steel	≤270	YBM251 YBC301	120(80—180)	0.3 (0.1-0.4)
			YBM351 YBG302	100(80-150)	0.3 (0.1-0.5)
			YC30S	80(60-120)	0.4 (0.1-0.5)
K	Cast iron	180-250	YBG302	130(100-180)	0.4 (0.1-0.5)

PCD&PCBN inserts

					
APHT-PCD	APHT-W	APHT-CBN	SEHT-PCD	SEHT-CBN	
Page B206	B206	B206	B224	B224	

Inserts for face milling

							
SEET-CF	SEET-CM	SEET-CR	SEET-DF	SEET-DM	SEET-DR	SEET-EF	SEET-EM
Page B219	B219	B219	B219	B219	B219	B219	B219
							
SEET-LH	SEET-W	SEHT-AL	SEK(E)N	SEKR	SEMR-M	SEKR-M	SNG(M)X-GL
Page B219	B219	B224	B220	B220	B220	B220	B222
							
SNG(M)X-GM	SNG(M)X-GH	SNCU-W4	ODHT-GM	ODHT-GH	ODHT-GL	ODMT-GM	ODHT-LH
Page B222	B222	B223	B211	B211	B211	B211	B211
							
OFKT-DF	OFKT-DM	OFKT-LH	ONHU-PF	ONHU-PM	ONHU-W	ONHU-GM	ONHU-GH
Page B211	B211	B211	B212	B212	B212	B212	B212
							
ONHU-GL	ONHU-W	ONMU-GM	ONMU-GH	SNEG-GM	SNEG-HGR	SNEG-W	HNEX-DF
Page B212	B212	B212	B212	B221	B221	B221	B208
							
HNEX-DM	HNEX-DR	PNEG-GL	PNEG-GM	PNEG-GH	PNEG-CF/CM/CR	PNEG-PF/PM/PR	PNEG-KL/KM/KH
Page B208	B208	B213	B213	B213	B213	B214	B214
							
LNKT-ZR	LNKT-ZR	LNKT-ZR	SPKW	SPKT	SP□N	SPKR-GM	SPEX
Page B209	B209	B209	B226	B224	B225	B226	B227
							
SPMR	SP□N	TPKN	TPGN	TPUN	TPMR		
Page B227	B228	B229	B229	B230	B230		

Inserts for face milling








	SEET□PER-APF	SEET□PER-APM	SEET□PER-APR	WNHU-GM	WNHU-LH	RCKT-DM	RCKT-DR	RCKT-ER
Page	B221	B221	B221	B231	B231	B216	B216	B216





	RCKT-NM	RCMW	RDKW□MO	RDKT□MO	RDKT□MO-NM
Page	B216	B216	B217	B217	B217

Inserts for square shoulder milling








	APHT-AL	APKT-APF	APKT-APM	APKT-ALH	ANGX□PNR-GM	ANMX□PNR-GM	ANGX□PNR-LH	LNKT-GM
Page	B206	B207	B207	B207	B208	B208	B208	B210

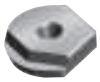

	LNKT-GL	LNMT-GM
Page	B210	B210

Inserts for profile milling









	ZDET	ZPNT	SDMT/SPMT	ROHX	XPHT-GM	ZOHX-GF	ZOHX-GM
Page	B232	B233	B218/B224	B217	B232	B233	B233

Inserts for side and face milling




	LNGX-GM	XSEQ	MPHT	QC□□L
Page	B209	B232	B210	B215

Inserts for high feed






	SDMT-DM	SDMT-PM	SDMT-NM	WPGT	WPGT-PM	SNGU-GM
Page	B218	B218	B218	B231	B231	B223

Inserts for T-slot milling

	MPHT
Page	B210

Inserts for helical milling


	APKT-PM/KM	SPMT-PM/KM
Page	B207	B224

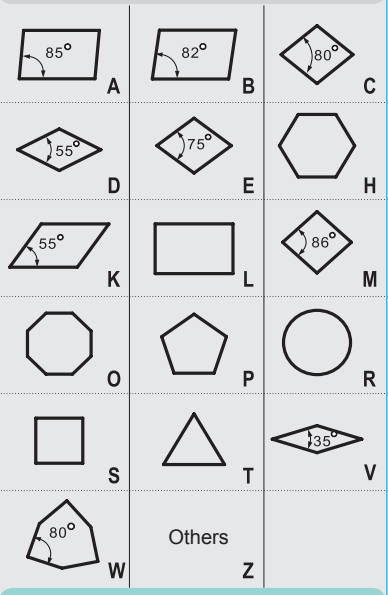
Inserts for chamfer milling

	SPMT
Page	B224

Indexable milling inserts code key

Insert shape

Insert Shape / Code



Chipbreaker and clamping system

Metric

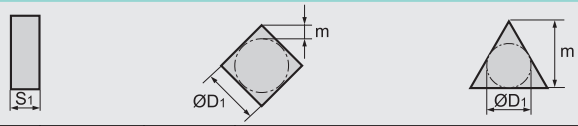
Code	With/Without hole	With/Without chipbreaker	Section plane of Insert	Code	With/Without hole	With/Without chipbreaker	Section plane of Insert
B	With	Without	>65°	N	Without	Without	
H	With	Single-side	>65°	R	Without	Single-side	
C	With	Without	>65°	F	Without	Double-side	
J	With	Double-side	>65°	A	With	Without	
W	With	Without	≤65°	M	With	Single-side	
T	With	Single-side	≤65°	G	With	Double-side	
Q	With	Without	≤65°	X	---	---	Special
U	With	Double-side	≤65°				

S P K N

Clearance angle of main cutting edge

Code	Clearance angle	Code	Clearance angle
A	3°	B	5°
C	7°	D	15°
E	20°	F	25°
G	30°	N	0°
P	11°	O	Other clearance angle

Tolerance



Code	Nose height M Tolerance(mm)	Inscribed circle ØD1 Tolerance(mm)	Thickness S Tolerance(mm)
A	±0.005	±0.025	±0.025
F	±0.005	±0.013	±0.025
C	±0.013	±0.025	±0.025
H	±0.013	±0.013	±0.025
E	±0.025	±0.025	±0.025
G	±0.025	±0.025	±0.13
J	±0.005	±0.05-±0.13	±0.025
K	±0.013	±0.05-±0.13	±0.025
L	±0.025	±0.05-±0.13	±0.025
M	±0.08-±0.18	±0.05-±0.13	±0.13
N	±0.08-±0.18	±0.05-±0.13	±0.025
U	±0.13-±0.38	±0.08-±0.25	±0.13

(Reference) details of M-class tolerance (identified by shape and size)

● Nose height tolerance(mm)

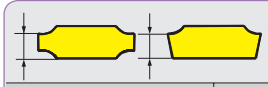
Inscribed circle	Regular triangle	Square	Diamond with 80°	Diamond with 55°	Diamond with 35°	Round
6.35	±0.08	±0.08	±0.08	±0.11	±0.16	---
9.525	±0.08	±0.08	±0.08	±0.11	±0.16	---
12.7	±0.13	±0.13	±0.13	±0.15	---	---
15.875	±0.15	±0.15	±0.15	±0.18	---	---
19.05	±0.15	±0.15	±0.15	±0.18	---	---
25.4	---	±0.18	---	---	---	---

● Tolerance of Inscribed Circle ØD1(mm)

Inscribed circle	Regular triangle	Square	Diamond with 80°	Diamond with 55°	Diamond with 35°	Round
6.35	±0.05	±0.05	±0.05	±0.05	±0.05	---
9.525	±0.05	±0.05	±0.05	±0.05	±0.05	±0.05
12.7	±0.08	±0.08	±0.08	±0.08	---	±0.08
15.875	±0.10	±0.10	±0.10	±0.10	---	±0.10
19.05	±0.10	±0.10	±0.10	±0.10	---	±0.10
25.4	---	±0.13	---	---	---	±0.13

Diameter of IC	Insert shape						
	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



Thickness is defined as the height from the bottom of insert to the highest part of cutting edge

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

12 04 ED T21 R -DM

Wiper

Kr		αn	
A	45°	A	3°
D	60°	B	5°
E	75°	C	7°
F	85°	D	15°
P	90°	E	20°
Z	Others	F	25°
		G	30°
		N	0°
		P	11°
		Z	Others

Chamfer (mm)

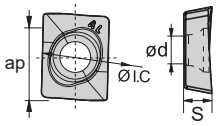
F	0-5°	0-0.10	K
E	1-10°	1-0.15	P
	2-15°	2-0.20	
	3-20°	3-0.25	
T	4-25°	4-0.30	W
	5-30°	5-0.35	
		6-0.40	
S		7-0.45	No mark

Chipbreaker code

Cutting direction

R	Right hand
L	Left hand
N	Neutral

APㅁㅁ



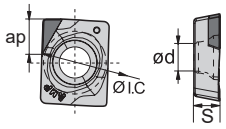
Good working condition Normal working condition Bad working condition

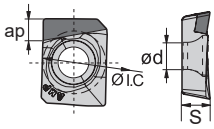
Workpiece material				
	K Cast iron		☺	☹
	N Non ferrous metal	😐		😐

Insert shape	Type	Basic dimensions(mm)				PCD	PCBN	Cemented carbide
		ØI.C	S	ød	$a_p$max	DN1021	BK1021	YD201
	**APHT12T304PPFR-AL**	12.7	3.97	4.4	12			★

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

APㅁㅁ





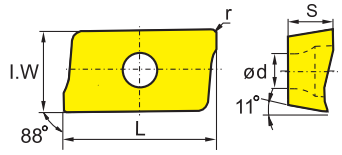
Good working condition Normal working condition Bad working condition

Workpiece material				
	K Cast iron		☺	☹
	N Non ferrous metal	😐		😐

Insert shape	Type	Basic dimensions(mm)				PCD	PCBN	Cemented carbide
		ØI.C	S	ød	$a_p$max	DN1021	BK1021	YD201
	**APHT12T304PPFR-PCD**	12.7	3.97	4.4	3	★		
	**APHT12T304PPFR-CBN**	12.7	3.97	4.4	2		○	
	**APHT12T304-W**	12.7	3.97	4.4	1	★	★	

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

APKT



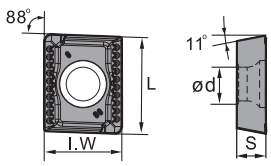
Good working condition Normal working condition Bad working condition

Workpiece material	
P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	I.W	S	ød	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	APKT070204-APF	7.32	4.34	2.38	2	0.4		●		●							★											
	APKT11T304-APF	12.24	6.6	3.6	2.8	0.4		●		●							★											
	APKT11T308-APF	12.24	6.6	3.6	2.8	0.8		●		●							★				●	●						
	APKT160408-APF	17.877	9.33	5.76	4.4	0.8		●									★				●	●						
	APKT070204-APM	7.32	4.34	2.38	2	0.4				●		●					★											
	APKT11T304-APM	12.24	6.6	3.6	2.8	0.4				●							★											
	APKT11T308-APM	12.24	6.6	3.6	2.8	0.8				●		●					★				●	●						
	APKT11T312-APM	12.24	6.6	3.6	2.8	1.2						●					★											
	APKT11T316-APM	12.24	6.6	3.6	2.8	1.6											★											
	APKT11T320-APM	12.24	6.6	3.6	2.8	2.0				●							★											
	APKT160408-APM	17.877	9.33	5.76	4.4	0.8				●		●					★				●	●						
	APKT160416-APM	17.877	9.33	5.76	4.4	1.6				●		●					★				●							
	APKT160420-APM	17.877	9.33	5.76	4.4	2.0						●					★											
	APKT160424-APM	17.877	9.33	5.76	4.4	2.4											★											
	APKT160430-APM	17.877	9.33	5.76	4.4	3.0											★											
	APKT11T304-ALH	12.24	6.6	3.6	2.8	0.4																				★	★	
	APKT11T308-ALH	12.24	6.6	3.6	2.8	0.8																				★	○	
	APKT160408-ALH	17.877	9.33	5.76	4.4	0.8																				★	★	

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

APKT



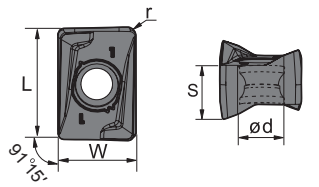
Good working condition Normal working condition Bad working condition

Workpiece material	
P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	I.W	S	ød	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	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												●	○									

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

AN□□



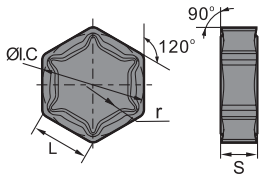
Good working condition Normal working condition Bad working condition

Workpiece material
- P Steel
- M Stainless steel
- K Cast iron
- N Non-ferrous metal
- S Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	W	S	ød	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	ANGX110504PNR-GM	11.85	8.4	5.7	3.5	0.4				★		★				★	★										
	ANGX110508PNR-GM	11.85	8.4	5.7	3.5	0.8				★		★				★	★				●						
	ANGX110520PNR-GM	11.85	8.4	5.7	3.5	2.0				★		★	★			★											
	ANGX150608PNR-GM	15.43	11.0	7.3	4.4	0.8				★		★				★	★				●						
	ANGX150616PNR-GM	15.43	11.0	7.3	4.4	1.6				★		★				★	★										
	ANGX150620PNR-GM	15.43	11.0	7.3	4.4	2.0						★	★			★											
	ANMX110508PNR-GM	11.85	8.4	5.7	3.5	0.8				★		★					★				★						
	ANMX150608PNR-GM	15.43	11.0	7.3	4.4	0.8				★		★				★	★										
	ANGX110502PNR-LH	11.85	8.4	5.7	3.5	0.2																				★	
	ANGX110504PNR-LH	11.85	8.4	5.7	3.5	0.4																				★	
	ANGX150608PNR-LH	15.43	11.0	7.3	4.4	0.8																				★	

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

HN□□



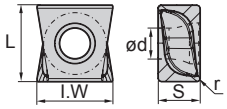
Good working condition Normal working condition Bad working condition

Workpiece material
- P Steel
- M Stainless steel
- K Cast iron
- N Non-ferrous metal
- S Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)				CVD Coating							PVD Coating									Cermet		Cemented carbide			
		L	ØI.C	S	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	HNEX090512-DF	9.16	15.875	5.56	1.2						★																
	HNEX090512-DM	9.16	15.875	5.56	1.2						★																
	HNEX090512-DR	9.16	15.875	5.56	1.2						○	★															

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

LN□□



Good working condition Normal working condition Bad working condition

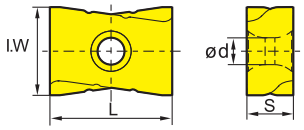
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating								Cermet		Cemented carbide			
		I.W	L	S	ød	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	LNGX100504-GM	9.9	10	5.5	4.1	0.4				●							●										
	LNGX100508-GM	9.9	10	5.5	4.1	0.8				●							●										
	LNGX100512-GM	9.9	10	5.5	4.1	1.2				●							●										
	LNGX100516-GM	9.9	10	5.5	4.1	1.6				●							●										
	LNGX100520-GM	9.9	10	5.5	4.1	2.0				●							●										
	LNGX100524-GM	9.9	10	5.5	4.1	2.4				●							●										
	LNGX100530-GM	9.9	10	5.5	4.1	3.0				●							●										
	LNGX100540-GM	9.9	10	5.5	4.1	4.0				●							●										
	LNGX140704-GM	13.4	14	7.5	4.4	0.4				●							●										
	LNGX140708-GM	13.4	14	7.5	4.4	0.8				●							●										
	LNGX140712-GM	13.4	14	7.5	4.4	1.2				●							●										
	LNGX140716-GM	13.4	14	7.5	4.4	1.6				●							●										
	LNGX140720-GM	13.4	14	7.5	4.4	2.0				●							●										
	LNGX140724-GM	13.4	14	7.5	4.4	2.4				●							●										
	LNGX140730-GM	13.4	14	7.5	4.4	3.0				●							●										
	LNGX140740-GM	13.4	14	7.5	4.4	4.0				●							●										
	LNGX140750-GM	13.4	14	7.5	4.4	5.0				●							●										

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

LN□□



Good working condition Normal working condition Bad working condition

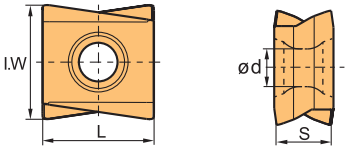
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)				CVD Coating							PVD Coating									Cermet		Cemented carbide			
		L	I.W	S	ød	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	LNKT1506EN-ZR	15.875	14	6.35	4.6					○	○						★										
	LNKT2007DN-ZR	20	17	7.94	4.6					○	○						★										
	LNKT2510-ZR	25	18	9.525	5.5					○		○					★										

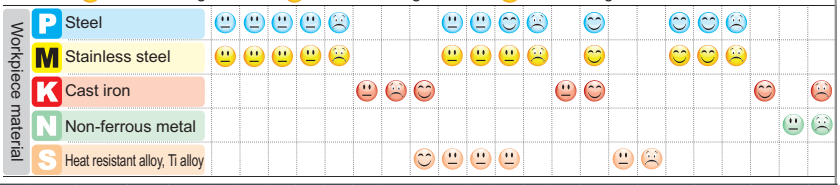
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

LN□□



Good working condition Normal working condition Bad working condition

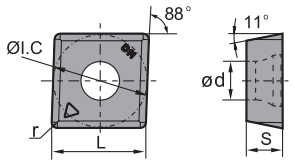
Workpiece material



Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	l.W	S	ød	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	LNKT080404PNR-GM	8.75	8.5	4.45	3.4	0.4				★		●	●				★				●						
	LNKT080408PNR-GM	8.75	8.5	4.45	3.4	0.8				★		●	●				★										
	LNKT080412PNR-GM	8.75	8.5	4.45	3.4	1.2				★		●	●				★										
	LNKT120608PNR-GM	12.7	13	6.75	4.4	0.8				★		●	●				★				●						
	LNKT120612PNR-GM	12.7	13	6.75	4.4	1.2				★		●	●				★										
	LNKT120616PNR-GM	12.7	13	6.75	4.4	1.6				★		●	●				★										
	LNKT120620PNR-GM	12.7	13	6.75	4.4	2.0				★		●	●				★										
	LNKT120624PNR-GM	12.7	13	6.75	4.4	2.4				★		●	●				★										
	LNKT120632PNR-GM	12.7	13	6.75	4.4	3.2				★		●	●				★										
	LNKT160708PNR-GM	16.05	15	7.35	5.5	0.8				★		●	●				★				●						
	LNKT160712PNR-GM	16.05	15	7.35	5.5	1.2				★		●	●				★										
	LNKT160716PNR-GM	16.05	15	7.35	5.5	1.6				★		●	●				★										
	LNKT080404PNR-GL	8.75	8.5	4.45	3.4	0.4				★		●	●				★				●						
	LNKT120608PNR-GL	12.7	13	6.75	4.4	0.8				★		●	●				★				●						
	LNKT160708PNR-GL	16.05	15	7.35	5.5	0.8				★		●	●				★				●						
	LNMT080404PNR-GM	8.75	8.5	4.45	3.4	0.4				★		●	●				★										
	LNMT120608PNR-GM	12.7	13	6.75	4.4	0.8				★		●	●				★										
	LNMT160708PNR-GM	16.05	15	7.35	5.5	0.8				★		●	●				★										

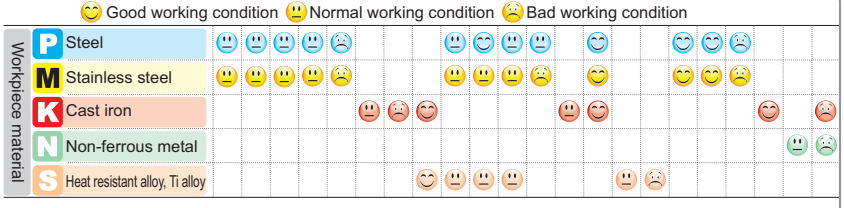
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

MP□□



Good working condition Normal working condition Bad working condition

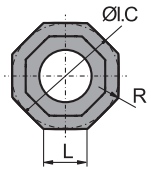
Workpiece material



Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating								Cermet		Cemented carbide			
		ØI.C	L	s	ød	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	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												★										

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

OF□□



Good working condition Normal working condition Bad working condition

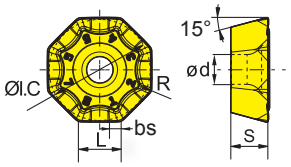
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating									Cermet		Cemented carbide			
		L	ØI.C	S	ød	R	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	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																				○		

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

OD□□



Good working condition Normal working condition Bad working condition

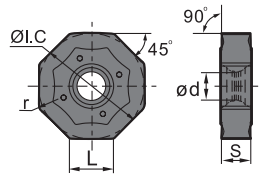
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating									Cermet		Cemented carbide			
		L	ØI.C	S	ød	R	bs	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	ODHT060508-GL	6.5	15.875	5.56	5.4	0.8	1.6				●		●				●	●											
	ODHT060508-GM	6.5	15.875	5.56	5.4	0.8	1.6				●		●				●	●				●						
	ODMT060512-GM	6.5	15.875	5.56	5.4	1.2	--				●		●				●	●				●						
	ODHT060508-GH	6.5	15.875	5.56	5.4	0.8	1.6				●		●				●	●										
	ODHT060508-LH	6.5	15.875	5.56	5.4	0.8	1.6																				●	●

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

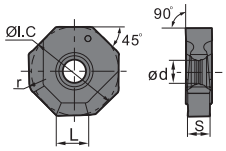
ON□□



Good working condition Normal working condition Bad working condition

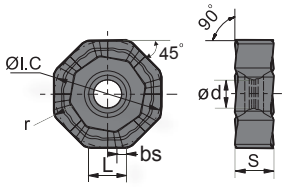
Workpiece material
- P Steel
- M Stainless steel
- K Cast iron
- N Non-ferrous metal
- S Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating									Cermet		Cemented carbide			
		L	ØI.C	S	ød	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	ONHU060408-PF	6.58	15.875	4.76	4.4	0.83		★		●		★			★	★												
	ONHU08T508-PF	8.37	20.2	5.77	5.3	0.83		★		●		★			★	★	●											
	ONHU060408-PM	6.58	15.875	4.76	4.4	0.83		★		★		★		●		●												
	ONHU08T508-PM	8.37	20.2	5.79	5.3	0.83		★		★		★																
	ONHU08T508-W	6.9	20.5	6.00	5.3	0.80		★				★		★														



★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

ON□□



Good working condition Normal working condition Bad working condition

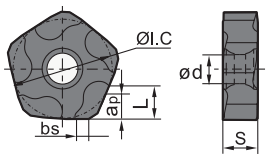
Workpiece material
- P Steel
- M Stainless steel
- K Cast iron
- N Non-ferrous metal
- S Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating									Cermet		Cemented carbide			
		L	ØI.C	S	ød	r	bs	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG105	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	ONHU060404ANN-GL	6.15	15.875	5.54	6	0.4	1.2				●		●					●	●					●						
	ONHU09T508ANN-GL	8.0	20.2	5.8	7	0.8	1.2				●		●					●	●					●						
	ONHU060408ANN-GM	6.15	15.875	5.54	6	0.8	1				●		●					●	●					●						
	ONMU060408-GM	6.15	15.875	5.54	6	0.8	-				●		●					●	●											
	ONHU09T508ANN-GM	8.0	20.2	5.8	7	0.8	1.2				●		●					●	●					●						
	ONMU09T512-GM	8.0	20.2	5.8	7	1.2	-				●		●					●	●											
	ONMU060408-GH	6.15	15.875	5.54	6	0.8	-				●		●					●	●					●						
	ONHU060408ANN-GH	6.15	15.875	5.54	6	0.8	1				●		●					●	●					●						
	ONHU09T508ANN-GH	8.0	20.2	5.8	7	0.8	1.2				●		●					●	●					●						
	ONMU09T512-GH	8.0	20.2	5.8	7	1.2	-				●		●					●	●											
	ONHU0604AN-W	6.15	15.875	4.97	6	0.8	-									●														

●Inserts are suitable for both left and right cuts.

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

PN□□



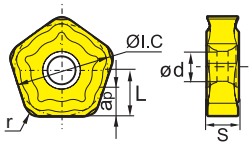
Good working condition Normal working condition Bad working condition

Workpiece material
- P Steel
- M Stainless steel
- K Cast iron
- N Non-ferrous metal
- S Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating									Cermet		Cemented carbide			
		L	ØI.C	S	ød	bs	ap	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	PNEG110512R-CF	5.4	15.875	5.56	4.64	1.6	5						●																
	PNEG110512L-CF	5.4	15.875	5.56	4.64	1.6	5						●																
	PNEG110512R-CM	5.4	15.875	5.56	4.64	1.6	5						●																
	PNEG110512L-CM	5.4	15.875	5.56	4.64	1.6	5						●																
	PNEG110512R-CR	5.4	15.875	5.56	4.64	1.6	5						●	●															
	PNEG110512L-CR	5.4	15.875	5.56	4.64	1.6	5						●	●															

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

PN□□



Good working condition Normal working condition Bad working condition

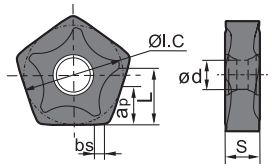
Workpiece material
- P Steel
- M Stainless steel
- K Cast iron
- N Non-ferrous metal
- S Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating									Cermet		Cemented carbide			
		L	ØI.C	S	ød	r	a_{pmax}	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	PNEG110512-GL	7.5	15.875	5.56	4.64	1.2	5.5				●						●	★											
	PNEG110530-GM	7.5	15.875	5.56	4.64	3.0	5.5				●						●	★											
	PNEG110530-GH	7.5	15.875	5.56	4.64	3.0	5.5				●						●	★											

●Inserts are suitable for both left and right cuts.

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

PN□□



Good working condition Normal working condition Bad working condition

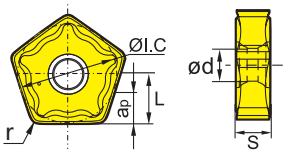
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	ØI.C	S	ød	bs	a_{pmax}	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	PNEG110512R-PF	7.5	15.875	5.56	4.64	1.4	7.5		★		●																		
	PNEG110512L-PF	7.5	15.875	5.56	4.64	1.4	7.5		★		●																		
	PNEG110512R-PM	7.5	15.875	5.56	4.64	1.4	7.5		★		●																		
	PNEG110512L-PM	7.5	15.875	5.56	4.64	1.4	7.5		★		●																		
	PNEG110512R-PR	7.5	15.875	5.56	4.64	1.4	7.5		★		●																		
	PNEG110512L-PR	7.5	15.875	5.56	4.64	1.4	7.5		★		●																		

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

PN□□



Good working condition Normal working condition Bad working condition

Workpiece material

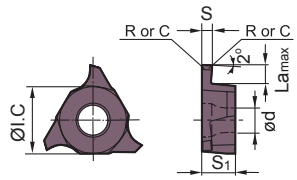
P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	ØI.C	S	ød	r	a_{pmax}	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	PNEG110512-KL	6.5	15.875	5.56	4.64	1.2	6.5						●	●															
	PNEG110512-KM	6.5	15.875	5.56	4.64	1.2	6.5						●	●															
	PNEG110512-KH	6.5	15.875	5.56	4.64	1.2	6.5						●	●															

●Inserts are suitable for both left and right cuts.

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

QC□□



Good working condition Normal working condition Bad working condition

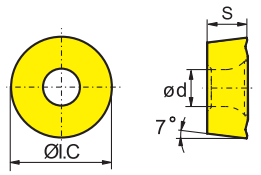
Workpiece material

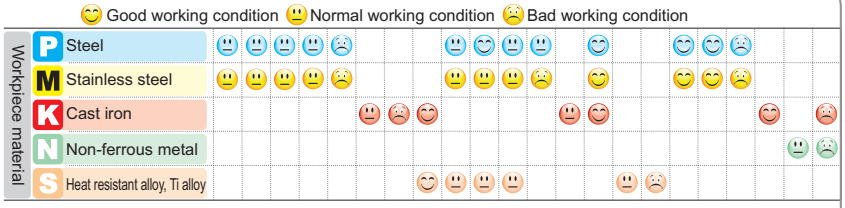
P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating									Cermet		Cemented carbide			
		S±0.025	Lamax	R/C	ØI.C	S1	ød	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	QC16L110-R01	1.10	2.00	R0.1	9.525	3.18	4.4									○	○												
	QC16L125-R02	1.25	2.00	R0.2	9.525	3.18	4.4									○	○												
	QC16L145-R02	1.45	2.00	R0.2	9.525	3.18	4.4									○	○												
	QC16L150-R02	1.50	2.00	R0.2	9.525	3.18	4.4									○	★												
	QC16L175-R02	1.75	2.00	R0.2	9.525	3.18	4.4									○	○												
	QC16L185-R02	1.85	2.50	R0.2	9.525	3.18	4.4									○	○												
	QC16L200-R02	2.00	2.50	R0.2	9.525	3.18	4.4									○	★												
	QC16L250-R02	2.50	2.50	R0.2	9.525	3.18	4.4									○	★												
	QC16L300-R02	3.00	3.00	R0.2	9.525	3.18	4.4									○	★												
	QC22L125-R02	1.25	2.00	R0.2	12.70	4.76	5.5									○	○												
	QC22L145-R02	1.45	2.00	R0.2	12.70	4.76	5.5									○	○												
	QC22L150-R02	1.50	3.50	R0.2	12.70	4.76	5.5									○	★												
	QC22L175-R02	1.75	3.50	R0.2	12.70	4.76	5.5									○	○												
	QC22L185-R02	1.85	3.50	R0.2	12.70	4.76	5.5									○	○												
	QC22L200-R02	2.00	3.50	R0.2	12.70	4.76	5.5									○	★												
	QC22L230-R02	2.30	3.50	R0.2	12.70	4.76	5.5									○	○												
	QC22L250-R03	2.50	4.00	R0.3	12.70	4.76	5.5									○	★												
	QC22L265-R03	2.65	4.00	R0.3	12.70	4.76	5.5									○	○												
	QC22L280-R03	2.80	4.00	R0.3	12.70	4.76	5.5									○	○												
	QC22L300-R03	3.00	4.00	R0.3	12.70	4.76	5.5									○	★												
	QC22L320-R03	3.20	4.00	R0.3	12.70	4.76	5.5									○	○												
	QC22L330-R03	3.30	4.00	R0.3	12.70	4.76	5.5									○	○												
	QC22L350-R03	3.50	5.00	R0.3	12.70	4.76	5.5									○	★												
	QC22L400-R04	4.00	5.00	R0.4	12.70	4.76	5.5									○	★												
	QC22L430-R04	4.30	5.00	R0.4	12.70	4.76	5.5									○	○												
	QC22L450-R04	4.50	5.00	R0.4	12.70	4.76	5.5									○	○												
	QC22L480-R04	4.80	5.00	R0.4	12.70	5.06	5.5									○	○												

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

RC□□

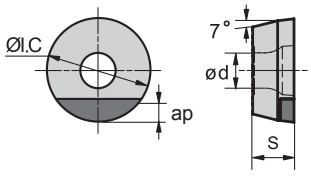


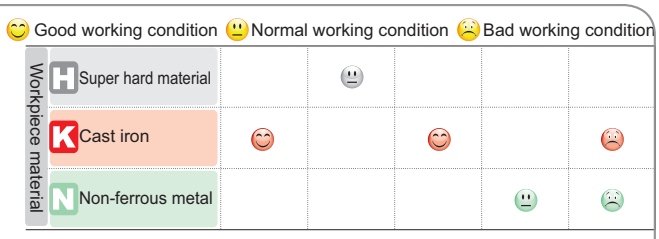


Insert shape	Type	Basic dimensions(mm)			CVD Coating							PVD Coating								Cermet		Cemented carbide			
		ØI.C	S	ød	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBS252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**RCKT10T3MO-DM**	10.0	3.97	4.4	●								●	★												
	**RCKT1204MO-DM**	12.0	4.76	4.0	●		●		●	○			●	★		●										
	RCKT1606MO-DM	16.0	6.35	5.56	●											●										
	**RCKT1204MO-DR**	12.0	4.76	4.0	○		○		○				●	★												
	RCKT1606MO-DR	16.0	6.35	5.56	●				●		○		●	★												
	RCKT2006MO-DR	20.0	6.35	6.55	●				●		○		○	★		●										
	**RCKT1204MO-ER**	12.0	4.76	4.0				★																		
	RCKT1606MO-ER	16.0	6.35	5.56				★																		
	RCKT2006MO-ER	20.0	6.35	6.55				★																		
	**RCKT1204MO-NM**	12.0	4.76	4.0				○							○	○			○	○						
	RCKT1606MO-NM	16.0	6.35	5.56				○							○	○			○	○						

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

RC□□

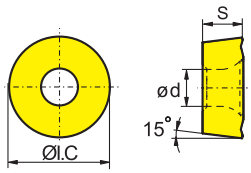




Insert shape	Type	Basic dimensions(mm)				PCBN		Cemented carbide		
		ØI.C	S	ød	apmax	BK1041	BK2531	YD051	YD101	YD201
	**RCMW1204MOBS01225**	12.0	4.76	4.1	2.7	○	○			
	RCMW1204MOAS01225	12.0	4.76	4.1	2.7	○	○			

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

RD□□



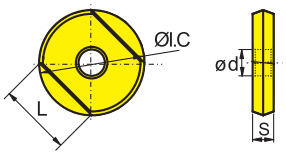
Good working condition Normal working condition Bad working condition

Workpiece material
- P Steel
- M Stainless steel
- K Cast iron
- N Non-ferrous metal
- S Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)			CVD Coating							PVD Coating									Cermet		Cemented carbide			
		ØI.C	S	ød	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	RDKW0702MO	7	2.38	2.8			○		●				●													
	RDKW0803MO	8	3.18	3.4	○				○				●	★		○										
	RDKW10T3MO	10	3.97	4.4	○				●				●	★												
	RDKW1204MO	12	4.76	4.4	●		●		●				●	★		●										
	RDKW1605MO	16	5.56	5.5	○				○				○	★		○										
	RDKW2006MO	20	6.35	6.5	○				○					○												
	RDKT10T3MO-NM	10	3.97	4.4										○					○	○						

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

RO□□



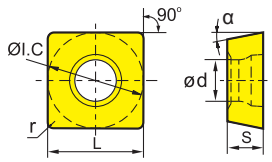
Good working condition Normal working condition Bad working condition

Workpiece material
- P Steel
- M Stainless steel
- K Cast iron
- N Non-ferrous metal
- S Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)				CVD Coating							PVD Coating									Cermet		Cemented carbide			
		ØI.C	L	S	ød	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	ROHX1203	12	8.5	3	4														○							
	ROHX1604	16	11.3	4	5														○							
	ROHX2005	20	14.1	5	5														○							

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SD□□



Good working condition Normal working condition Bad working condition

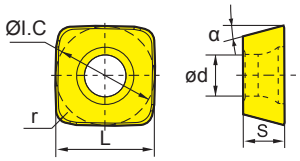
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating									Cermet		Cemented carbide			
		r	L	ØI.C	S	ød	α	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**SDMT090308**	0.8	9.525	9.525	3.18	4.4	15°			○									○										

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SD□□



Good working condition Normal working condition Bad working condition

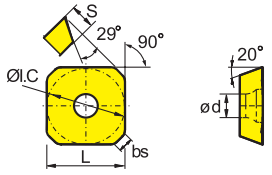
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating									Cermet		Cemented carbide			
		ØI.C	L	r	S	ød	α	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**SDMT06T208-DM**	6.35	6.35	0.8	2.58	2.5	15°		★			★						●	○				●					
	SDMT09T312-DM	9.525	9.525	1.2	3.97	4.0	15°		★			★						●	○									
	SDMT120412-DM	12.7	12.7	2.0	4.76	4.4	15°		★			★					★	●	○									
	SDMT150520-DM	15.875	15.875	2.0	5.56	5.5	15°		★			★					●	●	○									
	**SDMT06T208-PM**	6.35	6.35	0.8	2.58	2.5	15°		★		○						●					●	●					
	SDMT09T312-PM	9.525	9.525	1.2	3.97	4.0	15°		★		●						●											
	SDMT120412-PM	12.7	12.7	2.0	4.76	4.4	15°		★		●						●											
	SDMT150520-PM	15.875	15.875	2.0	5.56	5.5	15°		★		●						●											
	**SDMT06T208-NM**	6.35	6.35	0.8	2.58	2.5	15°				●												●					
	SDMT09T312-NM	9.525	9.525	1.2	3.97	4.0	15°				○											○	○					
	SDMT120412-NM	12.7	12.7	1.2	4.76	4.4	15°				○							○				○	○					
	SDMT150520-NM	15.875	15.875	2.0	5.56	5.5	15°				●							●					●					

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SE□□

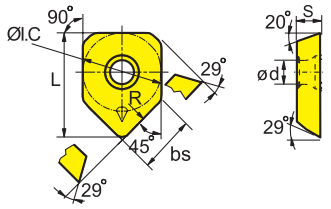


Good working condition Normal working condition Bad working condition

Workpiece material

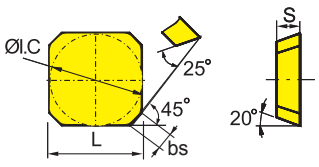
- P Steel
- M Stainless steel
- K Cast iron
- N Non-ferrous metal
- S Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating									Cermet		Cemented carbide			
		L	ØI.C	S	ød	bs	R	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	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	--	●	★	●		○					★		★										
	SEET18T6-DM	18.0	18.0	6.1	5.5	1.5	--		○		○																		
	SEET12T3-CM	13.4	13.4	3.97	4.1	2.55	--						★				★		○										
	SEET12T3-EM	13.4	13.4	3.97	4.1	2.55	--			●		●					★		★										
	SEET18T6-EM	18.0	18.0	6.1	5.5	1.5	--				○							○											
	**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		★	●			★				★							★					
	SEET18T6-W	24.78	18.0	6.1	5.5	11.0	500										○												



★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SE□□



Good working condition Normal working condition Bad working condition

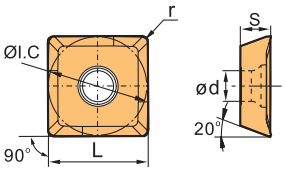
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)				CVD Coating							PVD Coating									Cermet		Cemented carbide			
		L	ØI.C	S	bs	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	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	●								○			○										
	**SEMR1203AN-M**	12.7	12.7	3.3	-										●												
	**SEKR1203AN-M**	12.7	12.7	3.3	-										●												
	**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							★					★							●			
	**SEMR1504AN-M**	15.875	15.875	4.9	-										●												
	**SEKR1504AN-M**	15.875	15.875	4.9	-										●												

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SE□□



Good working condition Normal working condition Bad working condition

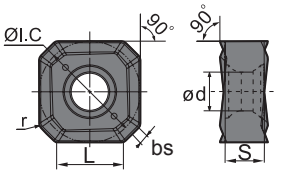
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	ØI.C	S	ød	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**SEET09T308PER-APF**	9.525	9.525	4.01	3.3	0.8					●	★			●		★										
	SEET120308PER-APF	13.308	13.308	4.04	4.1	0.8					●	★			●		★										
	**SEET09T308PER-APM**	9.525	9.525	4.01	3.3	0.8					●	★			●		★										
	SEET120308PER-APM	13.308	13.308	4.04	4.1	0.8					●	★			●		★										
	**SEET09T308PER-APR**	9.525	9.525	4.01	3.3	0.8					●	★			●		★										
	SEET120308PER-APR	13.308	13.308	4.04	4.1	0.8					●	★			●		★										

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SN□□

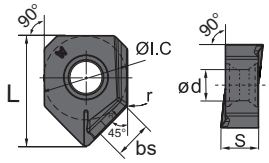


Good working condition Normal working condition Bad working condition

Workpiece material

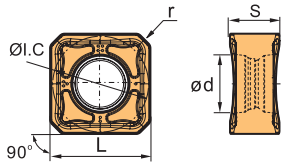
P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	ØI.C	S	bs	ød	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**SNEG1205ANR-GM**	7.6	12.0	4.76	1.05	4.6	0.8		★		★		★				★	★				○	○						
	SNEG1506ANR-GM	9.4	15.0	5.54	1.30	5.5	0.9		★		★		★				★	★					○						
	**SNEG1205ANR-HGR**	7.6	12.0	4.76	1.05	4.6	0.8		★		★			○			★	★										
	SNEG1506ANR-HGR	9.4	15.0	5.54	1.30	5.5	0.9		★		★			○			★	★										
	SNEG1907ANR-HGR	12.1	19.0	7.0	1.67	7.2	1.0		★		★			○			★	★										
	**SNEG1205ANR-W**	15.9	12.0	4.76	4.07	4.6	0.6										●											
	SNEG1506ANR-W	19.9	15.0	5.54	4.97	5.5	0.9										●											



★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SN□□



Good working condition Normal working condition Bad working condition

Workpiece material

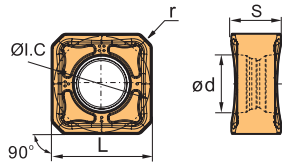
P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	ØI.C	S	ød	r	$a_p$max	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SNGX1205ANN-GL	12.7	12.7	6.5	5.9	0.8	6.5				●		●					★											
	SNMX120512-GL	12.7	12.7	6.5	5.9	1.2	6.5				●		●					★											
	SNGX1205ANN-GM	12.7	12.7	6.5	5.9	0.8	6.5				●		●					★					●						
	SNMX1205ANN-GM	12.7	12.7	6.5	5.9	0.8	6.5				●		●					★					●						
	SNMX120512-GM	12.7	12.7	6.5	5.9	1.2	6.5				●		●					★					●						
	SNGX1205ANN-GH	12.7	12.7	6.5	5.9	0.8	6.5				●		●					★											
	SNMX120512-GH	12.7	12.7	6.5	5.9	1.2	6.5				●		●					★											

•Inserts are suitable for both left and right cuts.

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SN□□



Good working condition Normal working condition Bad working condition

Workpiece material

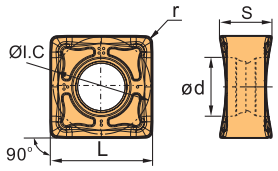
P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	ØI.C	S	ød	r	$a_p$max	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SNGX1205ENN-GL	12.7	12.7	6.5	5.9	0.8	8.0				●		●					★											
	SNMX120512-GL	12.7	12.7	6.5	5.9	1.2	8.0				●		●					★											
	SNGX1205ENN-GM	12.7	12.7	6.5	5.9	0.8	8.0				●		●					★					●						
	SNMX120512-GM	12.7	12.7	6.5	5.9	1.2	8.0				●		●					★					●						
	SNGX1205ENN-GH	12.7	12.7	6.5	5.9	0.8	8.0				●		●					★											
	SNMX120512-GH	12.7	12.7	6.5	5.9	1.2	8.0				●		●					★											

•Inserts are suitable for both left and right cuts.

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SN□□



Good working condition Normal working condition Bad working condition

Workpiece material

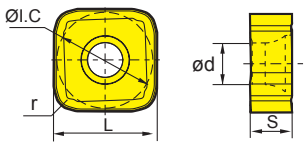
P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating									Cermet		Cemented carbide			
		L	ØI.C	S	ød	r	apmax	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG105	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SNGX1205PNN-GL	12.7	12.7	6.5	5.9	0.8	10.5				●		●					★											
	SNMX120512-GL	12.7	12.7	6.5	5.9	1.2	10.5				●		●					★											
	SNGX1205PNN-GM	12.7	12.7	6.5	5.9	0.8	10.5				●		●					★					●					
	SNMX120512-GM	12.7	12.7	6.5	5.9	1.2	10.5				●		●					★					●					
	SNGX1205PNN-GH	12.7	12.7	6.5	5.9	0.8	10.5				●		●					★										
	SNMX120512-GH	12.7	12.7	6.5	5.9	1.2	10.5				●		●					★										
	SNCU120420-W4	12.7	12.7	4.8	5.9	2	10.5								●														

●Inserts are suitable for both left and right cuts.

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SN□□



Good working condition Normal working condition Bad working condition

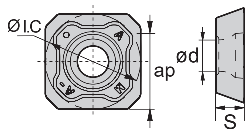
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating									Cermet		Cemented carbide			
		L	ØI.C	r	S	ød	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SNGU120620-GM	12.7	12.7	2.0	5.6	4.4				●						●	●											

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SE□□



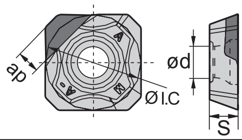
☺ Good working condition 😐 Normal working condition ☹ Bad working condition

Workpiece material	PCD	PCBN	Cemented carbide
K Cast iron		Good	Bad
N Non ferrous metal	Normal		Normal

Insert shape	Type	Basic dimensions(mm)				PCD	PCBN	Cemented carbide
		ØI.C	S	ød	apmax	DN1021	BK1021	YD201
	SEHT12T3AFFN-AL	12.7	3.97	4.4	6.6			★

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SE□□



☺ Good working condition 😐 Normal working condition ☹ Bad working condition

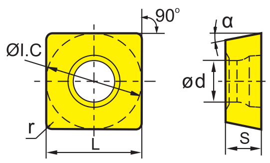
Workpiece material	PCD	PCBN	Cemented carbide
K Cast iron		Good	Bad
N Non ferrous metal	Normal		Normal

Insert shape	Type	Basic dimensions(mm)				PCD	PCBN	Cemented carbide
		ØI.C	S	ød	apmax	DN1021	BK1021	YD201
	SEHT12T308AFFN-PCD	12.7	3.97	4.4	2.5	★		
	SEHT12T308AFFN-CBN	12.7	3.97	4.4	2		○	

CBN insert edge can be treated as per machining requirements

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SP□□



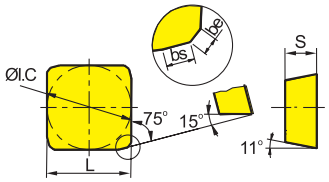
☺ Good working condition 😐 Normal working condition ☹ Bad working condition

Workpiece material	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
P Steel	Normal	Normal	Normal	Normal	Bad				Normal	Normal	Good	Bad		Good			Good	Good	Bad			
M Stainless steel	Normal	Normal	Normal	Normal	Bad				Normal	Normal	Normal	Bad		Good			Good	Good	Bad			
K Cast iron						Normal	Bad	Good					Normal	Good						Good		Bad
N Non-ferrous metal																					Normal	Bad
S Heat resistant alloy, Ti alloy								Good	Normal	Normal	Normal				Normal	Bad						

Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating									Cermet		Cemented carbide			
		r	L	ØI.C	S	ød	α	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SPMT060304	0.4	6.35	6.35	3.18	2.8	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°									★													

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SP□N



Good working condition Normal working condition Bad working condition

Workpiece material

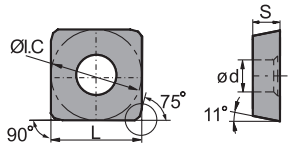
P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating									Cermet		Cemented carbide			
		L	ØI.C	S	be	bs	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	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	12.7	12.7	3.18	1	1.4								★	○													●
	SPKN1203EDFL	12.7	12.7	3.18	1	1.4								○	○													○
	SPKN1203EDSKR	12.7	12.7	3.18	1	1.4												○							○			
	SPKN1203EDSKL	12.7	12.7	3.18	1	1.4												○							○			
	SPKN1203EDTKR	12.7	12.7	3.18	1	1.4	●				●				○			★							●			○
	SPKN1203EDTKL	12.7	12.7	3.18	1	1.4									○			○							○			○
	SPKN1203EDS31R	12.7	12.7	3.18	1	1.4												○							○			
	SPKN1203EDS31L	12.7	12.7	3.18	1	1.4												○							○			
	SPKN1203EDT31R	12.7	12.7	3.18	1	1.4	●				●				○			★							●			○
	SPKN1203EDT31L	12.7	12.7	3.18	1	1.4									○			○							○			○
	SPKN1504EDER	15.875	15.875	4.76	1	1.4									○													
	SPKN1504EDEL	15.875	15.875	4.76	1	1.4									○													
	SPKN1504EDFR	15.875	15.875	4.76	1	1.4								○	○													○
	SPKN1504EDFL	15.875	15.875	4.76	1	1.4								○	○													○
	SPKN1504EDSKR	15.875	15.875	4.76	1	1.4												○							○			
	SPKN1504EDSKL	15.875	15.875	4.76	1	1.4												○							○			
	SPKN1504EDTKR	15.875	15.875	4.76	1	1.4	●								★			○							●			●
	SPKN1504EDTKL	15.875	15.875	4.76	1	1.4									○			○							○			●
	SPKN1504EDS32R	15.875	15.875	4.76	1	1.4												○							○			
	SPKN1504EDS32L	15.875	15.875	4.76	1	1.4												○							○			
	SPKN1504EDT32R	15.875	15.875	4.76	1	1.4	●								★			○							●			●
	SPKN1504EDT32L	15.875	15.875	4.76	1	1.4									○			○							○			●

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Ordering guide: **SPKN1203EDT3 1 R** chamfering angle 20° , chamfering width 0.15mm. For other edge shapes, see inserts code key standard.

SP□W



Good working condition Normal working condition Bad working condition

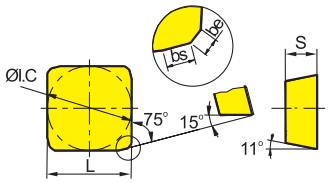
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating								Cermet		Cemented carbide			
		r	L	ØI.C	S	ød	α	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	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°									○													

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SP□R



Good working condition Normal working condition Bad working condition

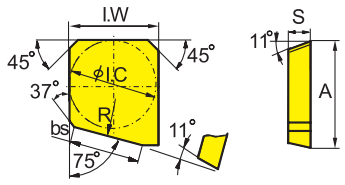
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating									Cermet		Cemented carbide			
		L	ØI.C	S	be	bs	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	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			●						★			★							●			●

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SP□X



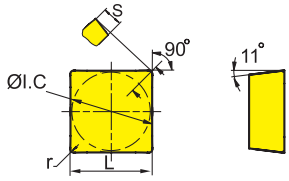
Good working condition Normal working condition Bad working condition

Workpiece material	
P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating								Cermet		Cemented carbide			
		A	ØI.C	l.W	S	bs	R	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	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																				○		●

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SP□□



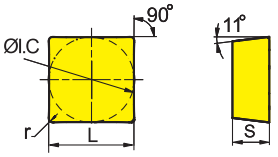
Good working condition Normal working condition Bad working condition

Workpiece material	
P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)				CVD Coating							PVD Coating										Cermet		Cemented carbide			
		L	ØI.C	s	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SPMR090304	9.525	9.525	3.18	0.4			○														○					
	SPMR09T304	9.525	9.525	3.97	0.4									○													
	SPMR090308	9.525	9.525	3.18	0.8			○																			
	SPMR120304	12.7	12.7	3.18	0.4			○														○					
	SPMR120308	12.7	12.7	3.18	0.8			○																			
	SPMR120312	12.7	12.7	3.18	1.2			○		○				○													

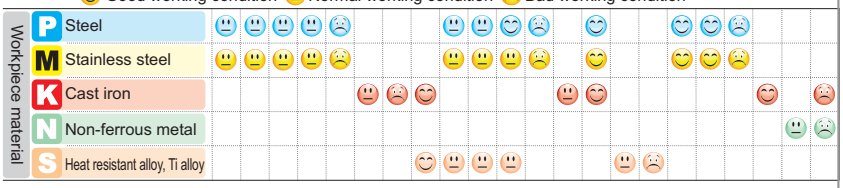
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SP□□



Good working condition Normal working condition Bad working condition

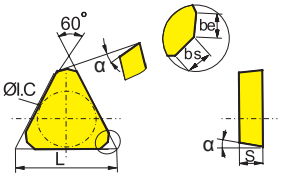
Workpiece material



Insert shape	Type	Basic dimensions(mm)				CVD Coating							PVD Coating									Cermet		Cemented carbide			
		L	ØI.C	s	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	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																				○	○	○
	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																			●			
	SPGN190408	19.05	19.05	4.76	0.8																					○	
	SPGN190416	19.05	19.05	4.76	1.6								○														

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

TP□□



Good working condition Normal working condition Bad working condition

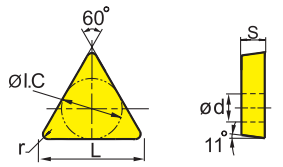
Workpiece material

		YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
P	Steel	😐	😐	😐	😐	☹				😐	😐	😊	☹		😊			😊	😊	☹			
M	Stainless steel	😐	😐	😐	😐	☹				😐	😐	😐	☹		😊			😊	😊	☹			
K	Cast iron						☹	☹	😊					😐	😊						😊		☹
N	Non-ferrous metal																					😐	☹
S	Heat resistant alloy, Ti alloy								😊	😐	😐	😐				😐	☹						

Insert shape	Type	Basic dimensions(mm) L	ØI.C	S	be	bs	α	CVD Coating YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	PVD Coating YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	Cermet YNG151	YNG151C	Cemented carbide YC30S	YD051	YD101	YD201
	TPKN2204PDFR	22	12.7	4.76	1.4	0.7	11°								○														○
	TPKN2204PDFL	22	12.7	4.76	1.4	0.7	11°								○														○
	TPKN2204PDR	22	12.7	4.76	1.4	0.7	11°	●				●			★	★			★							●	○	○	●
	TPKN2204PDL	22	12.7	4.76	1.4	0.7	11°																				●			
	TPKN2204PDTR	22	12.7	4.76	1.4	0.7	11°	●																			●			
	TPKN2204PDTL	22	12.7	4.76	1.4	0.7	11°	○																			○			

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

TP□□



Good working condition Normal working condition Bad working condition

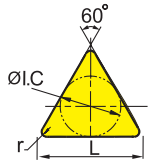
Workpiece material

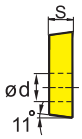
		YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
P	Steel	😐	😐	😐	😐	☹				😐	😐	😊	☹		😊			😊	😊	☹			
M	Stainless steel	😐	😐	😐	😐	☹				😐	😐	😐	☹		😊			😊	😊	☹			
K	Cast iron						☹	☹	😊					😐	😊						😊		☹
N	Non-ferrous metal																					😐	☹
S	Heat resistant alloy, Ti alloy								😊	😐	😐	😐				😐	☹						

Insert shape	Type	Basic dimensions(mm) L	ØI.C	s	r	CVD Coating YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	PVD Coating YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	Cermet YNG151	YNG151C	Cemented carbide 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																						○
	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																						○

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

TP□□





Good working condition Normal working condition Bad working condition

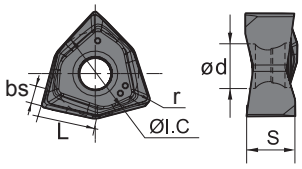
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)				CVD Coating							PVD Coating									Cermet		Cemented carbide			
		L	ØI.C	s	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	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												★										

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

WN□□



Good working condition Normal working condition Bad working condition

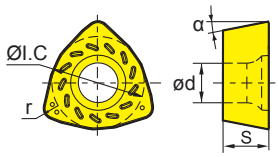
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	ØI.C	S	ød	bs	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	WNHU060404PNR-GM	5.7	9.525	4.0	3.5	1.35	0.4				★		★				★	★											
	WNHU060408PNR-GM	5.7	9.525	4.0	3.5	1.35	0.8				★		★				★	★											
	WNHU080608PNR-GM	7.7	12.7	5.4	4.4	1.6	0.8				★		★				★	★											
	WNHU080612PNR-GM	7.7	12.7	5.4	4.4	1.6	1.2				★		★				★	★											
	WNHU080616PNR-GM	7.7	12.7	5.4	4.4	1.6	1.6				★		★				★	★											
	WNHU080608PNR-LH	7.7	12.7	5.4	4.4	1.6	0.8																				★	

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

WP□□



Good working condition Normal working condition Bad working condition

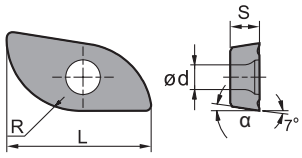
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating								Cermet		Cemented carbide			
		ØI.C	r	S	ød	α	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	WPGT050315ZSR	7.94	1.5	3.5	4.0	11°		★		●	●																	
	WPGT060415ZSR	9.525	1.5	4.2	4.4	11°		★		●	●					●												
	WPGT080615ZSR	12.85	1.5	6.35	5.5	11°		★		●	●					●												
	WPGT090725ZSR	15.00	2.5	7.00	5.5	11°		★		●	●					●												
	WPGT050315ZSR-PM	7.94	1.5	3.5	4.0	11°		★			●					●												
	WPGT060415ZSR-PM	9.525	1.5	4.2	4.4	11°		★			●					●						○						
	WPGT080615ZSR-PM	12.85	1.5	6.35	5.5	11°		★			●					●						○						
	WPGT090725ZSR-PM	15.00	2.5	7.00	5.5	11°		★			●					●												

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

XP□□



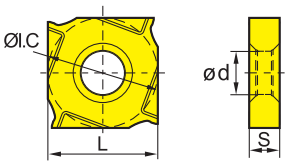
Good working condition Normal working condition Bad working condition

Workpiece material	
P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating							Cermet		Cemented carbide			
		R	ød	S	α	L	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	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	6.7	7.94	9°	40												●									
	XPHT50R2507-GM	25	9.2	7.94	9°	50												●									

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

XS□□



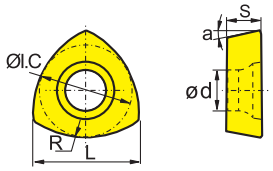
Good working condition Normal working condition Bad working condition

Workpiece material	
P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)				CVD Coating							PVD Coating								Cermet		Cemented carbide			
		ØI.C	L	S	ød	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	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												★									

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

ZD□□



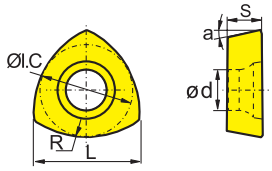
Good working condition Normal working condition Bad working condition

Workpiece material	
P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating							Cermet		Cemented carbide			
		ØI.C	L	S	R	ød	α	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	ZDET08T2CYR10	6.75	8.4	2.78	10	2.8	14°			○									○										
	ZDET1103CYR12.5	8.5	10.6	3.18	12.5	2.8	14°			○									○										
	ZDET13T3CYR16	10.5	13.2	3.97	16	4.4	14°			○									○										

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

ZP□□



Good working condition Normal working condition Bad working condition

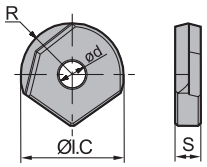
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating								Cermet		Cemented carbide			
		ØI.C	L	S	R	ød	α	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	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°			○									○										

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

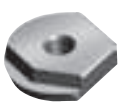
ZO□□



Good working condition Normal working condition Bad working condition

Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

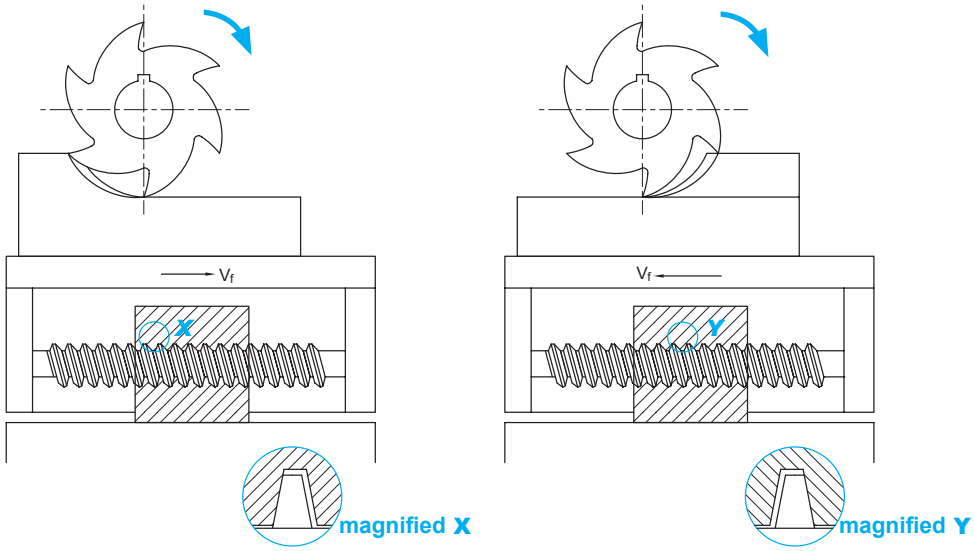
Insert shape	Type	Basic dimensions(mm)				CVD Coating							PVD Coating									Cermet		Cemented carbide			
		R	ØI.C	S	ød	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	ZOHX1203-GF	6	12	3	4														●								
	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														★								

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Common problems in milling and solutions

Failure		Main points of solution and inspection	Selection of tool material: Material with higher hardness	Selection of tool material: Material with perfect toughness	Cutting condition: Cutting speed	Cutting condition: Feed rate	Cutting condition: Cutting depth	Cutting condition: Change the diameter and width of milling tools	Cutting condition: Cutting liquid	Tool shape: Rake angle	Tool shape: Approach angle	Tool shape: Strength of cutting edge	Tool shape: Number of teeth	Tool shape: Increase the width of chip pocket	Tool shape: Examine the geometry shape of Minor cutting edge.	Tool shape: check the end face run-out	Tool shape: Improve the rigidity of tool	Machine clamping system: Clamping system of workpiece	Machine clamping system: Overhang of tool	Machine clamping system: Power, gap
Fracture of tool nose	severe abrasion on clearance face	Improper cutting condition			↓				✓											
		Unsuitable geometry shape of cutting edge	✓							↑		↓								
	severe abrasion on rake face	Improper cutting condition			↓	↓	↓		✓											
		Unsuitable geometry shape of cutting edge	✓							↑	↓	↓								
	Fracture of cutting edge	Improper cutting condition				↓	↓													
		Unsuitable geometry shape of cutting edge		✓							↓	↑			✓	✓	✓	✓	✓	✓
	Thermal cracking	Improper cutting condition			↓	↓	↓		✓											
		Unsuitable geometry shape of cutting edge								↑		↓								
	Build-up edge	Improper cutting condition			↑	↑			✓											
		Unsuitable geometry shape of cutting edge								↑		↓								
Machining precision	Bad surface roughness	Abrasion of tool Great vibration of milling tool	✓		↑	↓	↓		✓			↓			Wiper	✓				
	Burrs occuring	Unsuitable geometry shape of cutting edge			↓	↓	↓	✓												
		Improper geometry shape of cutting edge								↑	↑	↓			✓					
	Side collapse	Unsuitable geometry shape of cutting edge				↓	↓													
		Unsuitable geometry shape of cutting edge								↑	↓	↓	↑		✓		✓			
	Planeness and parallelism deterioration	Improper geometry Improper technique				↓	↓			↑	↑		↓		✓	✓	✓	✓	✓	✓
Other	Vibration	Cutting condition Improper technology			↓	↓	↓	✓		↑	↑	↓					✓	✓	✓	✓
	Chips twisting and jamming	Improper cutting condition			↑	↑↓		✓	✓				↓							
		Unsuitable geometry shape of cutting edge								↑			↓	✓						

Difference and selection between down milling and up milling



Up milling

Down milling

Climb milling (also called down milling): the feed direction of workpiece is the same as that of the milling rotation at the connecting position.

Conventional milling (also called up milling): the feed direction of workpiece is opposite to that of the milling rotation at the connecting position.

In down milling, the major force of cutting edge is the compressive stress, while in up milling is the tensile stress. The compressive strength of cemented carbide material is much larger than its tensile strength. In down milling, as chips become thin from thick gradually, cutting edge and workpiece press against each other. The friction between edge and workpiece is small, thus reducing the abrasion of edge, the hardening of workpiece surface and the surface roughness (Ra). In up milling, chips become thick from thin gradually. When the insert is cutting into the workpiece, it produces strong friction and more heat than in down milling, and make workpiece surface hardened.

In up milling, because horizontal direction of cutting force milling cutter conducting on workpiece is opposite to the feed direction of workpiece, the lead screw of worktable joints closely with one side of the screw nut. In down milling, the direction of cutting force is the same as the feed direction. When edge's radial force on workpiece is large enough, the worktable will bounce left and right, thus make the gap fall behind. The gap will return to the front side with the continuing rotation of lead screw. At this moment the worktable stops motion, however, it will bounce left and right again when the radial cutting force is large enough again. The periodical bounce of worktable will cause poor surface quality of workpiece and tool breakage.

When using end mills for down milling, the edges always starts cutting at the workpiece surface, therefore end mills are not suitable for machining workpiece with hardened surface.

Up milling is recommended for milling thin-wall components or square milling with high requirement for precision.

Pitch selection

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.

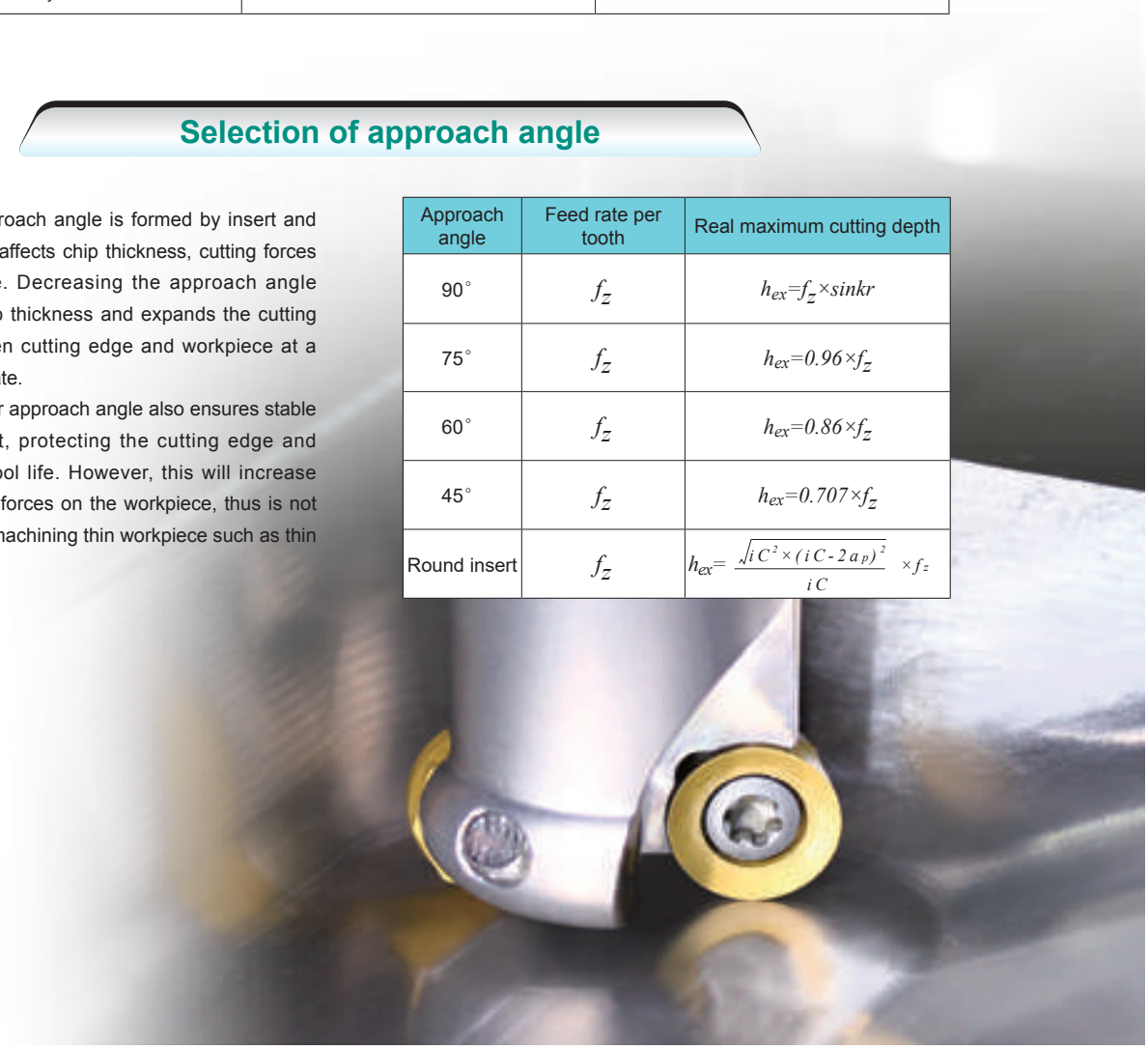
optimized stability		
L (Low)	**M** (Medium)	**H** (High)
Coarse pitch Unequal pitch design 	**Close pitch** 	**Extra close pitch** 
When the milling width is equal to diameter of cutter, the machining system is stable and main power of machine is sufficient, the use of coarse pitch can achieve high productive efficiency.	Used in general milling and multiple mixed productions.	When the milling width is less than diameter of cutter, cutting by maximum edges can achieve high productive efficiency.

Selection of approach angle

The approach angle is formed by insert and tool body. It affects chip thickness, cutting forces and tool-life. Decreasing the approach angle reduces chip thickness and expands the cutting area between cutting edge and workpiece at a given feed rate.

A smaller approach angle also ensures stable entry or exit, protecting the cutting edge and extending tool life. However, this will increase axial cutting forces on the workpiece, thus is not suitable for machining thin workpiece such as thin plate.

Approach angle	Feed rate per tooth	Real maximum cutting depth
90°	f_z	$h_{ex}=f_z \times sinkr$
75°	f_z	$h_{ex}=0.96 \times f_z$
60°	f_z	$h_{ex}=0.86 \times f_z$
45°	f_z	$h_{ex}=0.707 \times f_z$
Round insert	f_z	$h_{ex}=\frac{\sqrt{iC^2 \times (iC-2a_p)^2}}{iC} \times f_z$



General formula

V_c : cutting speed(*m/min*)
D_c : nominal diameter of milling tool(*mm*)
n : spindle speed(*rev/min*)
z_n : number of teeth
Q : metal removal rate(*cm³/min*)
L : Actual working distance(*mm*)
V_f : feed rate of worktable (feed speed)(*mm/min*)
f_z : feed rate per tooth(*mm/z*)
π : circumference ratio≈*3.14*
T_c : machining time(*min*)
f_z : feed rate per revolution (*mm/rev*)

- Cutting speed

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

- Spindle speed

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

- Feed rate of worktable (feed speed)

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

- Feed rate per tooth

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

- Feed rate per revolution

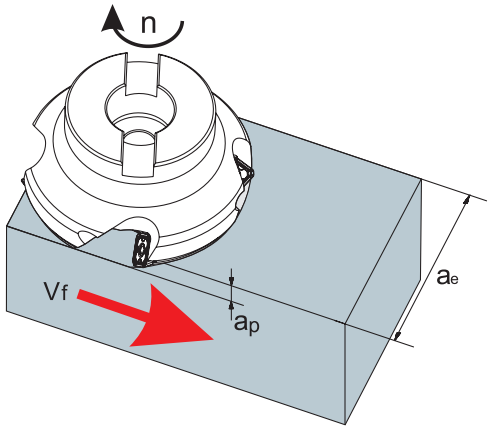
$$f_n = \frac{V_f}{n} \text{ (mm/rev)}$$

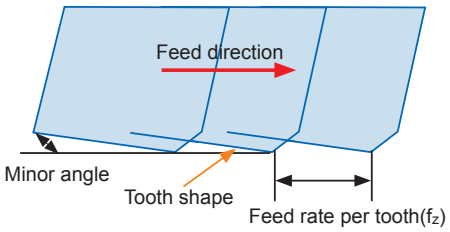
- Machining time

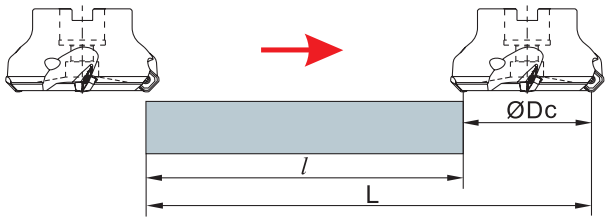
$$T_c = \frac{L}{V_f} \text{ (min)}$$

- Metal removal rate

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

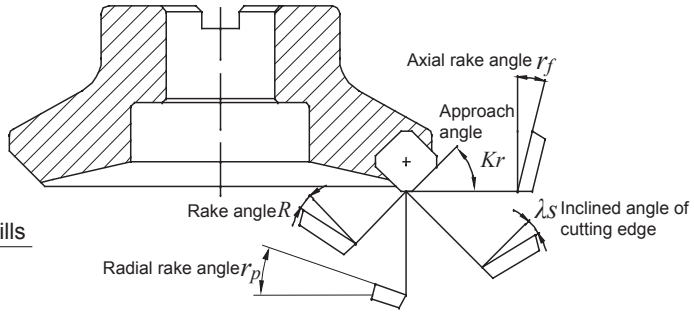






Function of each part in face milling

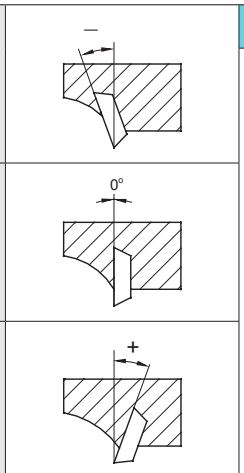
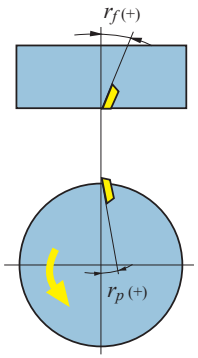
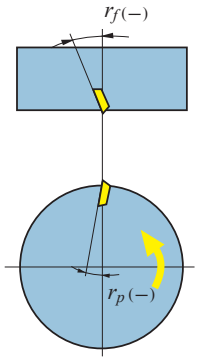
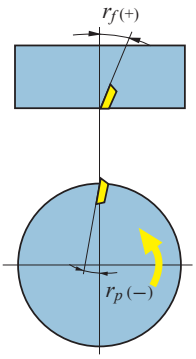
Main angles of face mills



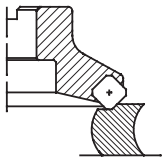
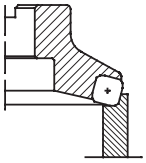
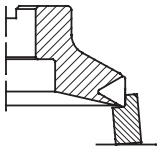
■Main angles of face mills

Designation	Function	Effect		
Axial rake angle r_f	Determining the chip direction	Negative angle, excellent capability of chip removal		
Radial rake angle r_p	Determining whether the cutting is easy and fast or not	Positive angle: good cutting performanc		
Approach angle Kr	Determining the chip thickness	Kr↑, chip thickness↑; Kr↓, chip thickness↓;		
Rake angle R	Determining whether easy and fast the cutting is or not	Poor cutting performance, High-strength cutting edge	(−)←0→(+)	Good cutting performance, Low-strength cutting edge
Inclined angle of cutting edge λs	Determining the chip flow direction	Poor capability of chip removal, High-strength cutting edge	(−)←0→(+)	Good performance of chip removal, Low-strength cutting edge

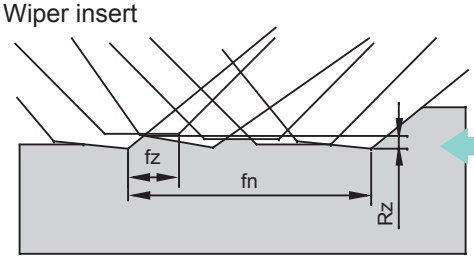
■Characteristics of different rake angles combined

		Double positive rake angle	Double negative rake angle	Positive and negative rake angle
Negative rake angle 0° rake angle Positive rake angle				
Axial rake angle r_f		+	−	+
Radial rake angle r_p		+	−	−
Applicable material machined	**P**	√		√
	M	√		√
	K		√	√
	N	√		
	S	√		√

■Cutting performances of different approach angles

Approach angle	**45°**	**75°**	**90°**
Schematic diagram			
Instruction	Axial force is the largest. It will bend when machining thin-wall workpiece, reducing the precision of workpiece. It can help avoid fringe breakage of workpiece when machining cast iron.	The main force is radial cutting force. It is often used in general face milling.	The axial force is zero in theory, suitable for milling thin plate workpiece.

Wiper insert

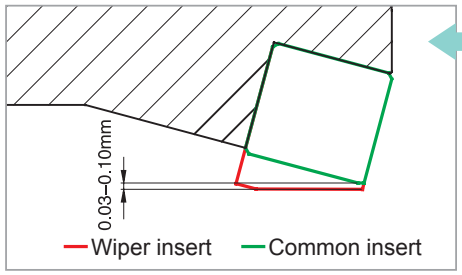


It has axial and radial run-out because tools and inserts have manufacturing tolerance. The axial run-out leads to poor surface roughness.

Solution

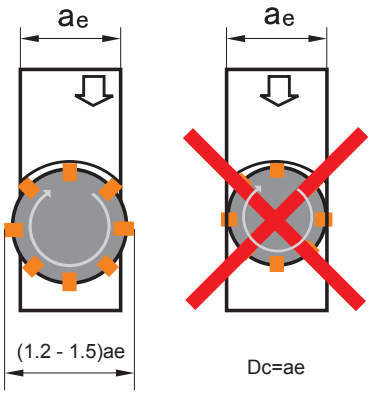
Mounting wiper inserts

usage



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

Selection of cutting width and tool cutting diameter in face milling



Dc：Tool cutting diameter
ae：Cutting width

Generally speaking, the relation between cutting width and tool cutting diameter is Dc=(1.2—1.5) ae.
In practical machining, same center line of tool center and work piece center should be avoided.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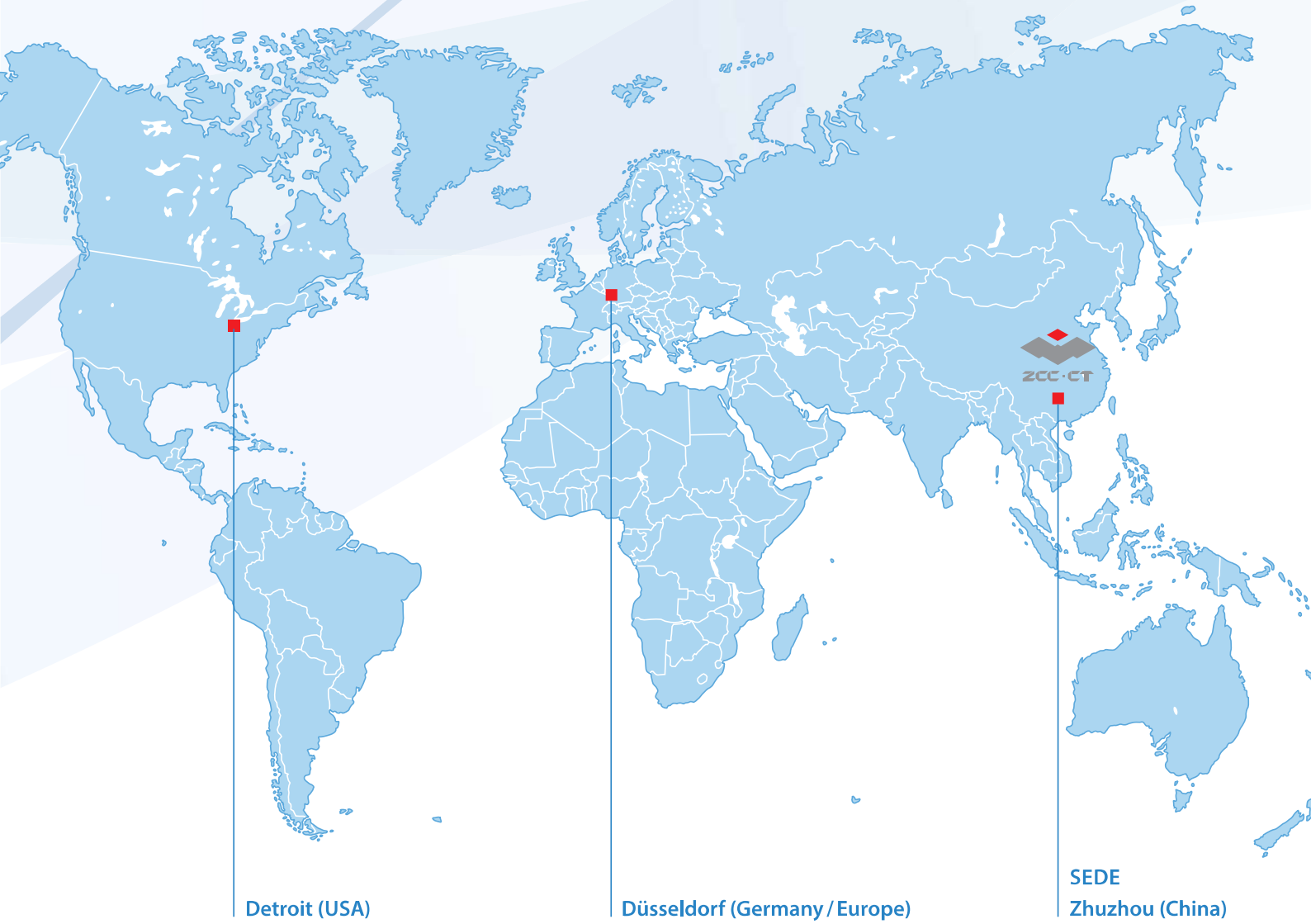
POWER



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Zhuzhou Cemented Carbide Cutting Tools Co.,Ltd.
Quality Management System
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CHINA QUALITY CERTIFICATION CENTRE


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