How to choose the right milling tool

■ Identify the classification of milling

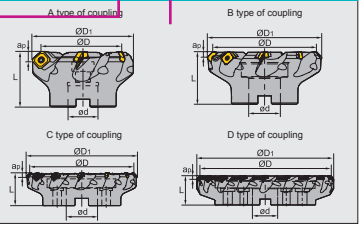
According to machining operations

- product series
- Define your type of milling operation
- Approach angle
- Applicable machining operations
  For face milling, chamfering, shoulder milling etc.
- Workpiece materials
- Structure and coupling size
- Inserts specification
  The insert shape, type, dimension, grade, stock ect.

Face milling tools Kr:45°

FMA01 P M K N S

Close pitch



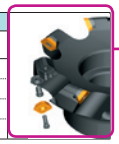
Specification of tools

Type		Stock R	Stock L	Basic dimensions(mm) ØD	ØD1	ød	L	apmax	Number of teeth Z	Type of coupling	Weight (kg)
FMA01	-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	1.2
	-125-B40-SE12-08	▲	△	125	136	40	63	6	8	B	2.6
	-160-B40-SE12-10	▲	△	160	170	40	63	6	10	B	4.3
	-200-C60-SE12-12	▲	△	200	210	60	63	6	12	C	7.6
	-250-C60-SE12-14	▲	△	250	260	60	63	6	14	C	13.5
	-315-D60-SE12-18	△	△	315	325	60	70	6	18	D	20.8

▲Stock available △Produce according to order

Spare parts

Diameter ØD	Screw for clamp inserts	Shim	Screw for clamp shim	Wrench	Wrench
Ø50 -Ø100	I60M3.5×10	--	--	WT15IS	--
Ø125-Ø315	I60M3.5×12	S13BS	SM5×7XA		WH35L

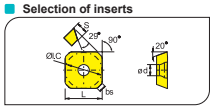


Applicable tool D14-D18 | Tools code key B20-B21 | Grade selection guide B15-B19 | Technical data B164-B170

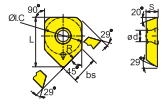
- Spare parts
- Assembly of tools and spare parts
- Tools specification
  The tool type, dimension, stock etc.
- Applicable tools and tools code key, reference to grade selection, technical data
- Tool shape

Selection of inserts

Good working condition | Normal working condition | Bad working condition



Insert shape	Type	L	I.C	S	d	bs	R	CVD Coating YBC301	CVD Coating YBM251	CVD Coating YBM351	CVD Coating YBD152	PVD Coating YBD252	PVD Coating YBG102	PVD Coating YBG202	PVD Coating YBG302	PVD Coating YBG152	PVD Coating YBG252	Cermet YNG151	Cermet YNG151C	Cemented carbide YC30S	Cemented carbide YD051	Cemented carbide YD101	Cemented carbide YD201
	SEET12T3-DF	13.4	13.4	3.97	4.1	2.55		●	●					★	☆								
	SEET12T3-CF	13.4	13.4	3.97	4.1	2.55					☆		★	☆	☆								
	SEET12T3-EF	13.4	13.4	3.97	4.1	2.55								☆	☆								
	SEET12T3-DM	13.4	13.4	3.97	4.1	2.55		●	●	○				★	★								
	SEET12T3-CM	13.4	13.4	3.97	4.1	2.55					★			★	☆								
	SEET12T3-EM	13.4	13.4	3.97	4.1	2.55			●	●				☆	★								
	SEET12T3-DR	13.4	13.4	3.97	4.1	2.55		●		●				★	★								
	SEET12T3-CR	13.4	13.4	3.97	4.1	2.55		●			★				★								
	SEET12T3-LH	13.4	13.4	3.97	4.1	2.55																☆	★
	SEET12T3-W	17.82	13.4	3.97	4.1	9.46	500		●		★			★					★				



★Recommended grade and always stock available ☆Recommended grade and produce according to order
●Available grade and always stock available ○Available grade and produce according to order

Chipbreaker selection for FMA01 milling inserts

Function / Classification	For Finishing	For Semi-Finishing	For Roughing
P	-DF	-DM	-DR
M, S	-EF	-EM	
K	-CF	-CM	-CR
AL	-LH		

- Chipbreaker selection

How to select the indexable milling insert

■ Detailed information for indexable milling inserts

List as per insert shape

Select insert grade as per work-piece material and operating condition
The operating condition which indicates applicable material is as the standard for grade selection.

😊 Good working condition: machine works well and stably, higher demands for size precision of component and surface quality.

😐 Normal working condition: machine works normally, size precision of component and surface quality are required to a certain extend.

☹ Bad working condition: machine works with bad stability, demands for high metal removal rate.

Insert shape and size

Insert shape

Insert grade

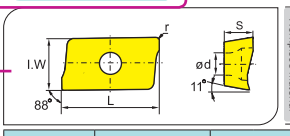
Insert shape

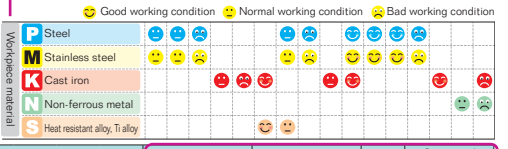
Stock condition

Insert dimension

Insert type

APKT□□





Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating					Cermet		Cemented Carbide		
		L	I.W	S	d	r	YBC301	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	APKT11T304-PF	12.24	6.5	3.6	2.8	0.4	●	○	○			☆	☆	☆								
	APKT11T308-PF	12.24	6.5	3.6	2.8	0.8		○				☆	☆									
	APKT11T312-PF	12.24	6.5	3.6	2.8	1.2							☆									
	APKT11T316-PF	12.24	6.5	3.6	2.8	1.6							☆									
	APKT160408-PF	17.877	9.33	5.76	4.4	0.8	●	○	○				☆	☆								
	APKT11T304-PM	12.24	6.5	3.6	2.8	0.4	●	●	●			★	★	★								
	APKT11T308-PM	12.24	6.5	3.6	2.8	0.8	●	●	○		★	★	★	★								
	APKT11T312-PM	12.24	6.5	3.6	2.8	1.2		○				☆	★	☆								
	APKT11T316-PM	12.24	6.5	3.6	2.8	1.6		○				☆	★	☆								
	APKT160408-PM	17.877	9.33	5.76	4.4	0.8	●	●	●		☆	★	★	★								
	APKT11T304-PR	12.24	6.5	3.6	2.8	0.4	●	●	●			☆	☆	☆								
	APKT11T308-PR	12.24	6.5	3.6	2.8	0.8								☆								
	APKT11T312-PR	12.24	6.5	3.6	2.8	1.2								☆								
	APKT11T316-PR	12.24	6.5	3.6	2.8	1.6								☆								
	APKT160408-PR	17.877	9.33	5.76	4.4	0.8								☆								
	APKT11T304-LH	12.24	6.5	3.6	2.8	0.4														★	★	
	APKT11T308-LH	12.24	6.5	3.6	2.8	0.8														★	☆	
	APKT160408-LH	17.877	9.33	5.76	4.4	0.8														★	★	

★Recommended grade and always stock available ☆Recommended grade and produce according to order
●Available grade and always stock available ○Available grade and produce according to order

Operating pattern	Series/Shape	Approach angle / Max. cutting depth.	Applicable insert	Application overview	Features
Face milling	**FMA01**  B22	Kr=45° a_{pmax}=6.0	SEET12T3-DF/DM/DR SEET12T3-CF/CM/CR SEET12T3-EF/EM SEET12T3-LH/W	General face milling the following material: Steel, alloy steel, stainless steel, cast iron, aluminum alloy, high temperature alloy	• Diameter range Ø50-Ø315 • Large rake angle designed make cutting more light and fast • Wide applications can achieve by using available inserts with different chipbreaker • Adopting wiper inserts can improve surface quality
	FMA02  B23	Kr=45° a_{pmax} =6.0	SEET12T3-DF/DM/DR SEET12T3-CF/CM/CR SEET12T3-EF/EM SEET12T3-LH/W	General face milling the following material: Steel, alloy steel, stainless steel, cast iron, aluminum alloy, high temperature alloy	• Diameter range Ø50-Ø125 • Large rake angle designed make cutting more light and fast • Wide applications can achieve by using available inserts with different chipbreaker • Coarse and differential pitch, reduce vibration.
	FMA03  B27	Kr=45° a_{pmax}=5.5	SE□N1203AF□□ SE□R1203AF□□	General face milling steel, stainless steel, cast iron	• Diameter range Ø80-Ø315 • Large rake angle designed make cutting more light and fast • Top clamping achieves better vibration resistance
		Kr=45° a_{pmax}=7.5	SE□N1504AF□□ SE□R1504AF□□		
	FMA04  B30	Kr=45° a_{pmax}=3.5	OFKT05T3-DF/DM OFKT05T3-LH	Face milling steel, alloy steel, cast iron, aluminum alloy	• Diameter range Ø50-Ø160 • High economy milling tool with 8 cutting edges • Screw clamping, high precision
	 B34	Kr=45° a_{pmax} =5.0	OFKR0704-DF/DM	Face milling steel, alloy steel and cast iron	• Diameter range Ø125-Ø315 • High economy milling tool with 8 cutting edges • Top clamping is easy to assemble and disassemble
	FMA05  B37	Kr=45° a_{pmax}=5.0	SNKN1204ENN	Face milling cast iron	• Diameter range Ø200-Ø450 • Extra close pitch milling tool, rapid feed rate • Double negative rake angle, high cutting edge strength • High economy milling tool with 8 cutting edges
		Kr=45° a_{pmax}=5.5	SNKN1504ENN		
	FMD02  B39	Kr=55° a_{pmax}=6.0	HNEX090512-DF/DM HNEX090512-DR	Face milling cast iron	• Diameter range Ø80-Ø315 • New milling tool generation with higher feed rate • High economy milling tool with 12 cutting edges • Top clamping is easy to assemble and disassemble
	FMD03  B41	Kr=60° a_{pmax}=17.0	LNKT2510-ZR	Heavy-duty face milling steel and alloy steel	• Diameter rang Ø125-Ø400 • Double positive rake angle can reduce the cutting force • Suitable for heavy machining with big cutting depth • Easy to assemble and clamp inserts
	FME01  B44	Kr=75° a_{pmax}=8.0	LNE32.534	Face milling cast iron	• Diameter range Ø125-Ø315 • Close pitch milling tools • Suitable for face milling cast iron parts on large-power machines.
	FME02  B46	Kr=75° a_{pmax}=6.0	SPKW1204EDFR SPKW1204EDSR SPKT1204EDR	Face milling steel, alloy steel and cast iron	• Diameter range Ø50-Ø125 • Kr 75°, general face milling • Wide applications can achieve by using inserts with different chipbreakers

★ Recommended product

Indexable Milling Tools

Indexable milling tools overview

Operating pattern	Series/Shape	Approach angle / Max. cutting depth.	Applicable insert	Application overview	Features
	FME03  B48	Kr=75° a_{pmax}=6.0	SP□N1203(1504)ED□□ SP□R1203(1504)ED□□	General face milling steel, alloy steel and cast iron	• Diameter range Ø80-Ø315 • Kr 75°, general face milling • Top clamping is easy to assemble and disassemble
		Kr=75° a_{pmax}=8.0	SP□N1504ED□□ SP□R1504ED□□		
Face milling	**FMP01**  B52	Kr=90° a_{pmax}=18.0	TP□N2204PD□ TPKN2204PDF□ TPKN2204PDT□	Face milling steel, alloy steel and cast iron	• Diameter range Ø80-Ø315 • Kr 90° , square shoulder milling • Top clamping is easy to assemble and disassemble
	FMP02  B54	Kr=90° a_{pmax}=6.7	SEET09T308PER-PF/PM SEET09T308PER-PR	Face milling steel, alloy steel, stainless steel and cast iron	• Diameter range Ø50-Ø315 • Kr 90°, for square shoulder millin • Different pitch design: coarse pitch, close pitch and extra close pitch • High precision insert, high work-piece surface quality • Optimized chipbreaker and grade, for finish machining, semi-finish machining and rough machining.
		Kr=90° a_{pmax}=10.8	SEET120308PER-PF/PM SEET120308PER-PR		
	FMR01  B60	a_{pmax}=5.0	RCKT10T3MO-DM	Cavity profile milling steel, alloy steel, stainless steel and cast iron	• Diameter range Ø25-Ø50 • R-type inserts possess stronger cutting edges • Suitable for machining curved surface of mould • Economical milling cutters with screw clamping
		a_{pmax}=6.0	RCKT1204MO-DM/DR		
	FMR02  B63	a_{pmax}=6.0	RCKT1204MO-DM/DR	Face milling and cavity profile milling steel, alloy steel, stainless steel and cast iron	• Diameter range Ø63-Ø200 • R-type inserts possess stronger cutting edges • Suitable for machining curved surface of mould • Economical milling tools with screw clamping
		a_{pmax}=8.0	RCKT1606MO-DM/DR		
		a_{pmax}=10.0	RCKT2006MO-DR		
	FMR03  B65	a_{pmax}=4.0	RDKW0803MO	Cavity profile milling steel, alloy steel, stainless steel and cast iron	• Diameter range Ø25-Ø50 • R-type inserts possess stronger cutting edges • Suitable for machining curved surface of mould • Economical milling tools with screw clamping
		a_{pmax}=5.0	RDKW10T3MO		
		a_{pmax}=6.0	RDKW1204MO		
	FMR04  B67	a_{pmax}=6.0	RDKW1204MO	Face milling and cavity profile milling steel, alloy steel, stainless steel and cast iron	• Diameter range Ø50-Ø160 • R-type inserts possess stronger cutting edge • Suitable for machining curved surface of mould
		a_{pmax}=8.0	RDKW1605MO		
		a_{pmax}=10.0	RDKW2006MO		

★ Recommended product

Operating pattern	Series/Shape	Approach angle / Max. cutting depth.	Applicable insert	Application overview	Features
Square shoulder milling	**EMP01**  B70	Kr=90° a_{pmax}=10.5	APKT11T3□□-PF/PM/PR APKT11T3□□-LH	Multi-function milling steel, alloy steel, stainless steel, cast iron and Al alloy	• Two mounting modes: Straight shank and Weldon shank, Diameter range Ø12-Ø63 • Kr 90° , for square shoulder milling, slot milling, ramp milling etc. • Wiper inserts also suitable for face milling. • Inserts with 3D helical cutting edge, less cutting force
		Kr=90° a_{pmax}=15.5	APKT160408- PF/PM/PR APKT160408-LH		
	EMP02  B77	Kr=90° a_{pmax}=10.5	APKT11T3□□- PF/PM/PR APKT11T3□□-LH	Face milling steel, alloy steel, stainless steel, cast iron and Al alloy	• Diameter range Ø50-Ø100 • Kr 90° , for square shoulder milling • Wiper inserts also suitable for face milling. • Inserts with 3D helical cutting edge, less cutting force
		Kr=90° a_{pmax}=15.5	APKT160408- PF/PM/PR APKT160408-LH		
	EMP03  B80	Kr=90° a_{pmax}=39.0	APKT11T3□□-PF/PM/PR APKT11T3□□-LH	Adopting large cutting depth, for milling steel, alloy steel, stainless steel, cast iron and Al alloy	• Diameter range Ø50-Ø100 • End milling tools with positive helical angle, good chip removal • For side face milling and slot machining • Close pitch, high machining efficiency.
	EMP04  B81	Kr=90° a_{pmax}=58.0	APKT11T3□□-PF/PM/PR APKT11T3□□-LH	Adopting large cutting depth, for milling steel, alloy steel, stainless steel, cast iron and Al alloy	• Diameter range Ø20-Ø40 • End milling tools with positive helical angle, good chip removal • For side face milling and slot machining • Close pitch, high machining efficiency.
	EMP05  B85	Kr=90° a_{pmax}=40.0	APMT1135PDR APMT160408PDER	Multi-function drilling and milling steel alloy steel, stainless steel and cast iron	• Diameter range Ø25-Ø40 • End edge over center, for drilling directly

Recommended product

Indexable Milling Tools

Indexable milling tools overview

Operating pattern	Series/Shape	Approach angle / Max. cutting depth.	Applicable insert	Application overview	Features
Profile milling	**BMR01**  B87	Cutting depth: see the detailed information about tool specifications	ZDET□□CYR□□ ZPNT2204CYR□□ SPMT060304 SDMT□□	Profile machining steel, stainless steel and cast iron	• Diameter range Ø20-Ø63 • Very suitable for rough machining large mold • Ball nose cutter with 3-cutting-edges inserts, perfect economical efficiency
	BMR02  B90		ROHX□□	Profile machining steel, stainless steel and cast iron	• Diameter range Ø12-Ø20 • Applied for profile finish machining • Good assembly stability. • Insert with two cutting edges, perfect economical efficiency.
	BMR03 ★  B92 ★  B93 ★  B94 ★  B95		XPHT□□R□□- GM	Profile machining steel, stainless steel and cast iron	• Diameter range Ø16-Ø50 • Very suitable for rough machining moulds • Equipped with complicated 3D chipbreaker inserts, high circular edge precision. • Tool body with high rigidity
	BMR04 ★  B104 ★  B105		ZOHX□□	Profile machining steel, stainless steel and cast iron	• Diameter range Ø10-Ø40 • High precision, for finish profile machining. • Two types of chipbreaker, used in different machining condition • High assembling precision, good stability.

★ Recommended product

Operating pattern	Series/Shape	Approach angle / Max. cutting depth.	Applicable insert	Application overview	Features
Side and face milling	**SMP01**  B112  B113	Cutting depth: see the detailed information about tool specifications	XSEQ12□□	Slot milling steel, stainless steel and cast iron.	• Diameter range Ø100-Ø250 • Two mounting types: mounting by keyway and Arbor mounting • Groove width range : 4, 5, 6, 7, 8mm
	SMP03  B116  B117		MPHT□□	Slot milling steel, stainless steel and cast iron.	• Diameter range Ø80-Ø250 • Two mounting types: mounting by keyway and Arbor mounting • Groove width range : 8, 10, 12, 16, 18, 20mm
Special milling (high feed)	**XMR01**  B119  B119  B121  B122	Cutting depth: see the detailed information about tool specifications	SDMT□□-DM	Face and profile milling steel, stainless steel and cast iron in cavity applications	• Diameter range Ø25-Ø100 • Two mounting types: Straight shank and Arbor mounting • The cutting forces are decomposed effectively, realize cutting with high feed rate. • For plunge milling • Double clamping, firm and reliable.
			WPGT□□ZSR	Face and profile milling steel, stainless steel and cast iron in cavity applications	• Diameter range Ø20-Ø100 • Two mounting types: Straight shank and Arbor mounting • The cutting forces are decomposed effectively, realize cutting with high feed rate. • Double clamping, firm and reliable.
T-slot milling	**TMP01**  B127	Kr=90°	MPHT□□	Machining T slot in cast iron	• Diameter range Ø21-Ø60 • Machining the T-slot with size range 12, 14, 18, 22, 28, 36. • 86° rhombic inserts with positive angle are used.

★ Recommended product

Indexable Milling Tools

Indexable milling tools overview

Operating pattern	Series/Shape	Approach angle / Max. cutting depth.	Applicable insert	Application overview	Features
Helical end mills	**HMP01**  B129	Kr=90° a_{pmax}=55	APKT150412-ZM SPMT120408-ZM	Milling steel, alloy steel and cast iron with large cutting depth.	• Diameter range Ø40-Ø80 • Coarse and differential pitch, less vibration • Holistic structure with good rigidity, interchangeable heads achieve high economical efficiency.
	 B130	Kr=90° a_{pmax}=144			
	HMP01 EC  B131	Kr=90° a_{pmax}=144			
Chamfer milling	**CMZ01**  B134	Kr=30°	SPMT120408	Chamfer machining steel, alloy steel, stainless steel and cast iron	• Diameter range Ø12, Ø25, Ø32, Ø36 • With the function of milling small surface
	CMA01  B135	Kr=45°			
	CMD01  B136	Kr=60°			

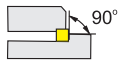
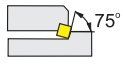
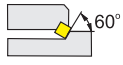
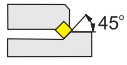
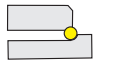
Recommended product

Milling insert grades overview

Workpiece material	ISO code	Coating		Cermet	Cemented carbide	PCBN and PCD material
		CVD	PVD			
P Steel	P01			YNG151, YNG151C		
	P10		YBG202, YBG252	YNG151, YNG151C		
	P20	YBC301, YBM251, YBM351	YBG202, YBG252			
	P30	YBC301, YBM251, YBM351	YBG202, YBG252, YBG302		YC30S	
	P40		YBG252, YBG302		YC30S	
M Stainless steel	M01			YNG151, YNG151C		
	M10	YBM251	YBG202, YBG252	YNG151, YNG151C		
	M20	YBM251, YBM351	YBG202, YBG252	YNG151, YNG151C		
	M30	YBM351	YBG252, YBG302		YC30S	
	M40		YBG302		YC30S	
K Cast iron	K01					YCB011
	K10	YBD152	YBG102, YBG252	YNG151, YNG151C	YD051	YCB011
	K20	YBD152, YBD252	YBG102, YBG152, YBG252	YNG151, YNG151C	YD051, YD201	
	K30	YBD252	YBG152, YBG252		YD201	
	K40					
N Non ferrous metal	N01					YCD011
	N10				YD101	YCD011
	N20				YD101, YD201	
	N30				YD201	
S Heat resistant alloy & Ti alloy	S01					
	S10		YBG202			
	S20		YBG202			
	S30					
H Super hard material	H01					YCB012
	H10					YCB012
	H20					
	H30					

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

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

Sequence number of series

Cutting diameter ØD

Side and face milling tool : diameter
X cutting edge width

Coupling structure and type
(as follow figure)

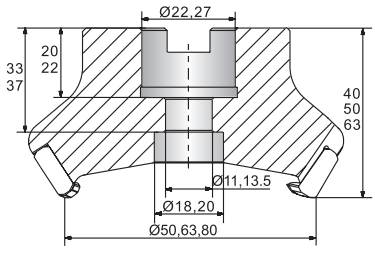
A	A type of coupling	XP	Weldon shank
B	B type of coupling	G	Straight shank
C	C type of coupling	MW	Morse adapter with a conical hole and without a flat tail
D	D type of coupling		

Coupling size(mm)
(as follow figure)

FM E 03 - 100 - B 32

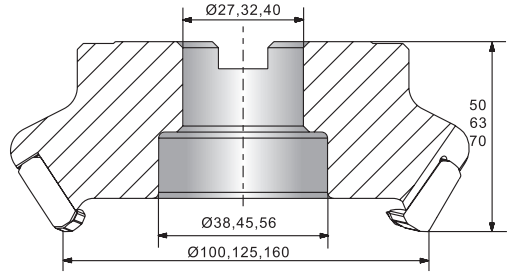
Coupling structure of Arbor

A type of coupling



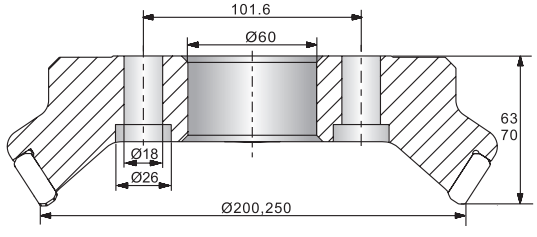
Ø50- Ø80 Arbor face mill as per GB5342-96

B type of coupling



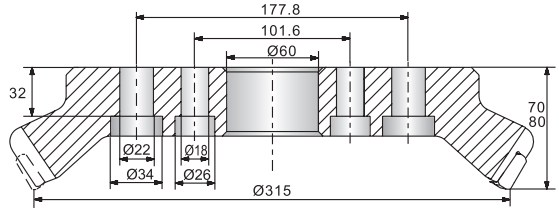
Ø100- Ø160 Arbor face mill as per GB5342-96

C type of coupling



Ø200- Ø250 Arbor face mill as per GB5342-96

D type of coupling



D≥Ø315 Arbor face mill as per GB5342-96

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

Insert shape	
 C	 D
 R	 S
 T	 L
 H	 O

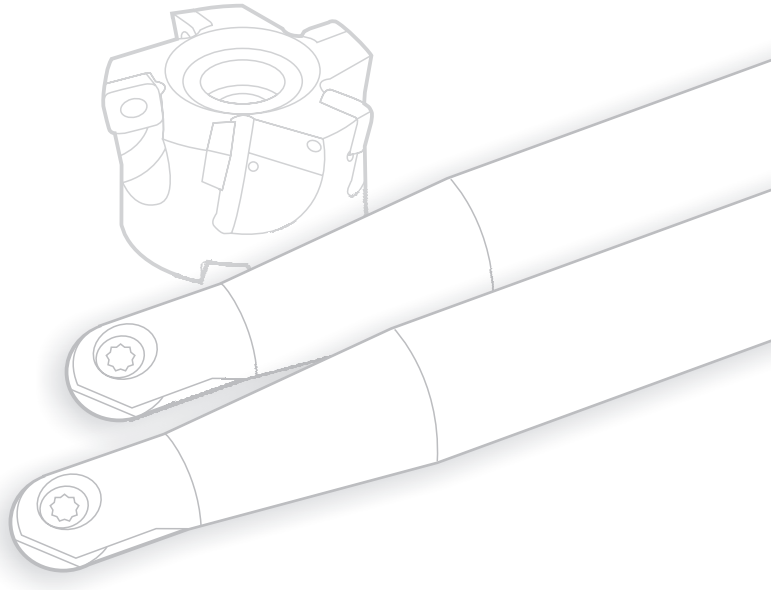
Insert clearance angle	
N	0°
B	5°
C	7°
P	11°
D	15°
E	20°
F	25°

Length of cutting edge						
Diameter of IC	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	25

-SP12-06L

Number of teeth
(number of flute when it's helical end mills)

Cutting direction
(R: Right L: Left It's right when default)

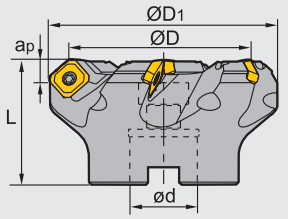


Face milling tools Kr:45°

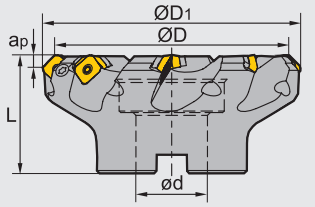
FMA01 P M K N S

Close pitch

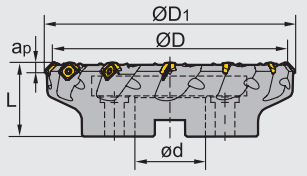
A type of coupling



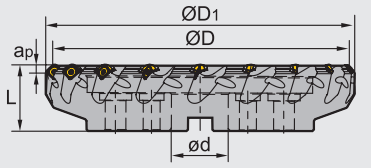
B type of coupling



C type of coupling



D type of coupling



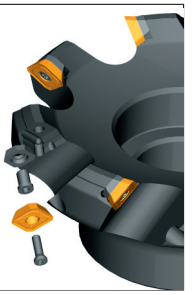
Specification of tools

Type		Stock		Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
		R	L	ØD	ØD1	ød	L	apmax			
FMA01	**-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	1.2
	-125-B40-SE12-08	▲	△	125	136	40	63	6	8	B	2.6
	-160-B40-SE12-10	▲	△	160	170	40	63	6	10	B	4.3
	-200-C60-SE12-12	▲	△	200	210	60	63	6	12	C	7.6
	-250-C60-SE12-14	▲	△	250	260	60	63	6	14	C	13.5
	-315-D60-SE12-18	△	△	315	325	60	70	6	18	D	20.8

▲Stock available △Produce according to order

Spare parts

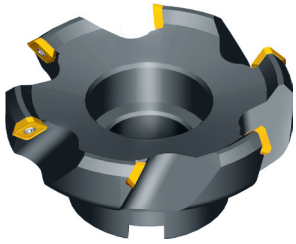
Diameter ØD	Insert screw	Shim	Shim screw	Wrench	Wrench
Ø50 -Ø100	I60M3.5×10	--	--	WT15IS	--
Ø125-Ø315	I60M3.5×12	S13BS	SM5×7XA		WH35L



Applicable tool D14-D18 Tools code key B20-B21 Grade selection guide B15-B19 Technical data B164-B170

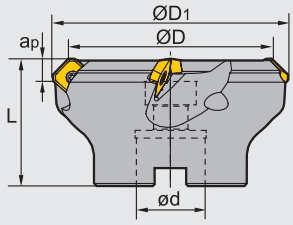
Face milling tools Kr:45°


FMA02 P M K N S

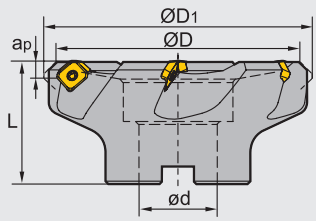


Coarse and differential pitch

A type of coupling



B type of coupling



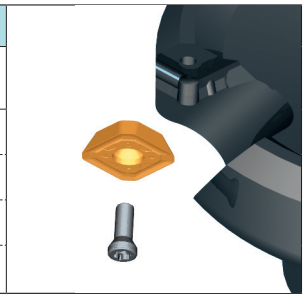
Specification of tools

Type		Stock		Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
		R	L	ØD	ØD1	ød	L	apmax			
FMA02	-050-A22-SE12-03	▲	△	50	61	22	40	6	3	A	0.4
	-063-A22-SE12-04	▲	△	63	74	22	40	6	4	A	0.6
	-080-A27-SE12-04	▲	△	80	91	27	50	6	4	A	1.3
	-100-B32-SE12-05	▲	△	100	107	32	50	6	5	B	1.3
	-125-B40-SE12-06	▲	△	125	131	40	63	6	6	B	2.6

▲Stock available △Produce according to order

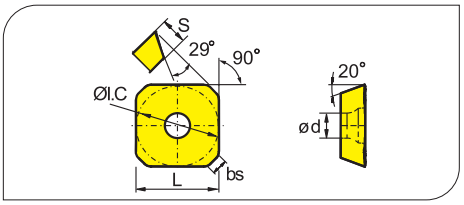
Spare parts

Diameter ØD	Insert screw	Wrench
		
Ø50-Ø125	I60M3.5×10	WT15IS

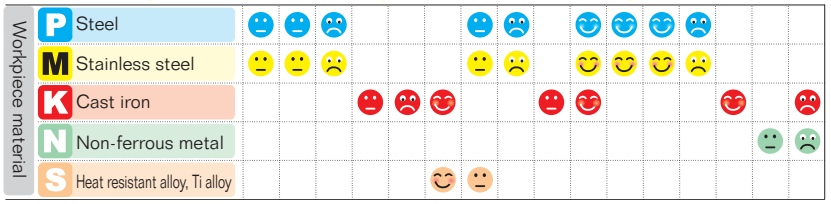


Applicable tool D14-D18 Tools code key B20-B21 Grade selection guide B15-B19 Technical data B164-B170

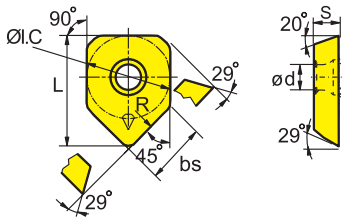
Selection of inserts



Good working condition Normal working condition Bad working condition



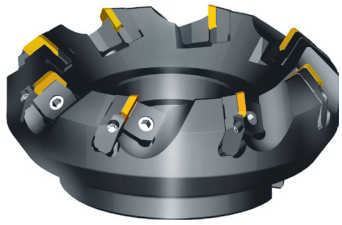
Insert shape	Type	Basic dimensions(mm)						CVD Coating					PVD Coating					Cermet		Cemented carbide			
		L	I.C	S	d	bs	R	YBC301	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SEET12T3-DF	13.4	13.4	3.97	4.1	2.55		●	●					★	☆								
	SEET12T3-CF	13.4	13.4	3.97	4.1	2.55					☆		★	☆	☆								
	SEET12T3-EF	13.4	13.4	3.97	4.1	2.55								☆	☆								
	SEET12T3-DM	13.4	13.4	3.97	4.1	2.55		●	●	○				★	★								
	SEET12T3-CM	13.4	13.4	3.97	4.1	2.55					★			★	☆								
	SEET12T3-EM	13.4	13.4	3.97	4.1	2.55			●	●				☆	★								
	SEET12T3-DR	13.4	13.4	3.97	4.1	2.55		●		●				★	★								
	SEET12T3-CR	13.4	13.4	3.97	4.1	2.55		●			★				★								
	SEET12T3-LH	13.4	13.4	3.97	4.1	2.55																☆	★
	SEET12T3-W	17.82	13.4	3.97	4.1	9.46	500		●		★			★				★					



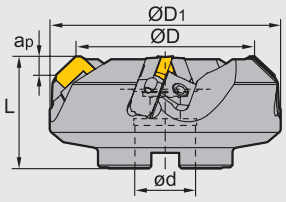
★Recommended grade and always stock available ☆Recommended grade and produce according to order
●Available grade and always stock available ○Available grade and produce according to order

Face milling tools Kr:45°

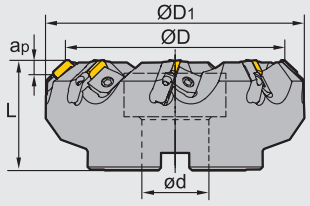
FMA03 P M K



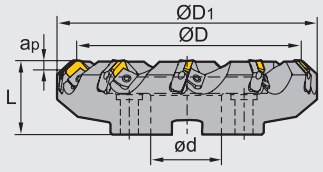
A type of coupling



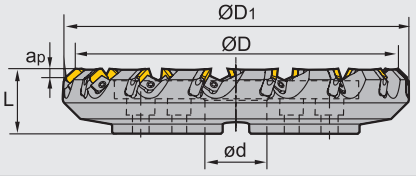
B type of coupling



C type of coupling



D type of coupling



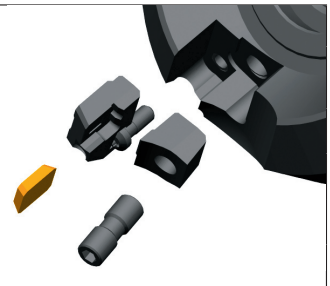
Specification of tools

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 △Produce according to order

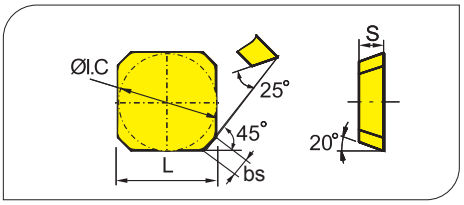
Spare parts

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

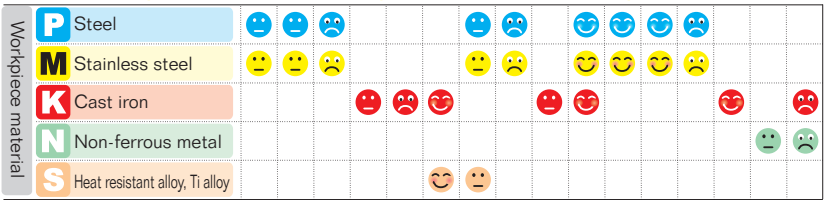


Applicable tool D14-D18 Tools code key B20-B21 Grade selection guide B15-B19 Technical data B164-B170

Selection of inserts



Good working condition Normal working condition Bad working condition

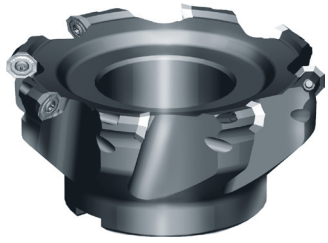


Insert shape	Type	Basic dimensions(mm)				CVD Coating					PVD Coating					Cermet		Cemented carbide			
		L	I.C	S	bs	YBC301	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SEEN1203AFTN	12.7	12.7	3.18	1.8							☆				●					
	SEKN1203AFFN	12.7	12.7	3.18	1.8						★										
	SEKN1203AFN	12.7	12.7	3.18	1.8	●						☆						●			○
	SEKN1203AFTN	12.7	12.7	3.18	1.8	●	●	●				★	☆					●			●
	SEKR1203AFN	12.7	12.7	3.18	1.8	●						☆	☆								
	SEKN1504AFN	15.875	15.875	4.76	1.6	●	●														●
	SEKN1504AFTN	15.875	15.875	4.76	1.6	○	●	●					☆					●			●
	SEKR1504AFN	15.875	15.875	4.76	1.6					★			★					●			

★Recommended grade and always stock available ☆Recommended grade and produce according to order
●Available grade and always stock available ○Available grade and produce according to order

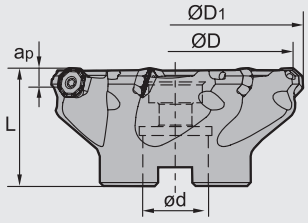
Face milling tools Kr:45°

FMA04 P M K N

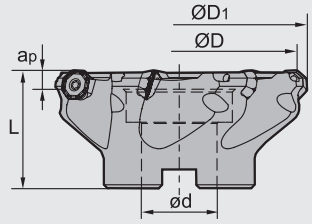


Screw clamping

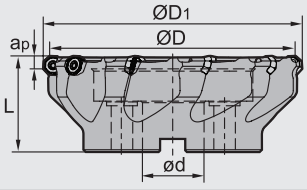
A type of coupling



B type of coupling



C type of coupling



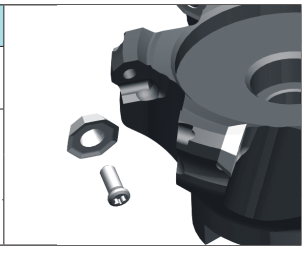
Specification of tools

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 △Produce according to order

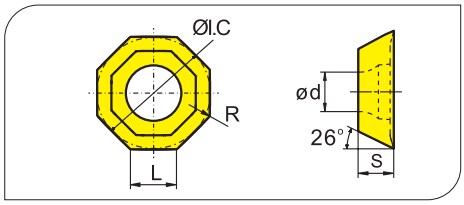
Spare parts

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

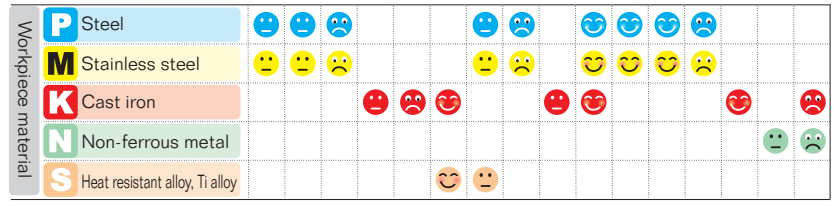


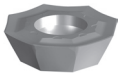
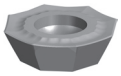
Applicable tool D14-D18 Tools code key B20-B21 Grade selection guide B15-B19 Technical data B164-B170

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	I.C	S	d	R	YBC301	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**OFKT05T3-DF**	5.26	12.7	3.97	4.4	0.5						☆	★									
	**OFKT05T3-DM**	5.26	12.7	3.97	4.4	0.5		○				★	★	★								
	**OFKT05T3-LH**	5.26	12.7	3.97	4.4	0.5															☆	

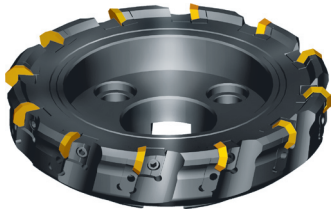
★Recommended grade and always stock available ☆Recommended grade and produce according to order
●Available grade and always stock available ○Available grade and produce according to order

Chipbreaker selection for FMA04 milling inserts

Classification / Function	For finishing	For semi-finishing
P	-DF	-DM
M		
K		
AL	-LH	

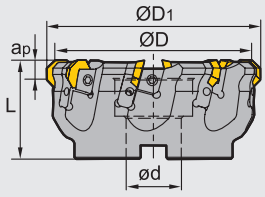
Face milling tools Kr:45°

FMA04 P M K

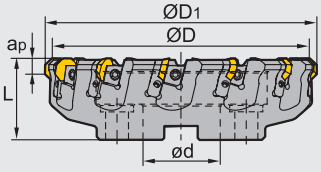


Top clamping

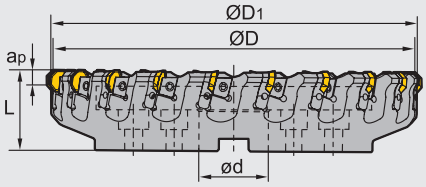
B type of coupling



C type of coupling



D type of coupling



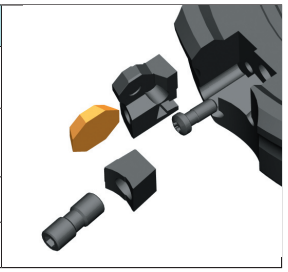
Specification of tools

Type		Stock		Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
		R	L	ØD	ØD1	ød	L	apmax			
FMA04	-125-B40-OF07-08	▲	△	125	136	40	63	5	8	B	3.9
	-160-B40-OF07-10	▲	△	160	171	40	63	5	10	B	5.9
	-200-C60-OF07-12	▲	△	200	211	60	63	5	12	C	7.6
	-250-C60-OF07-16	▲	△	250	261	60	63	5	16	C	13.3
	-315-D60-OF07-20	▲	△	315	321	60	63	5	20	D	20.3

▲Stock available △Produce according to order

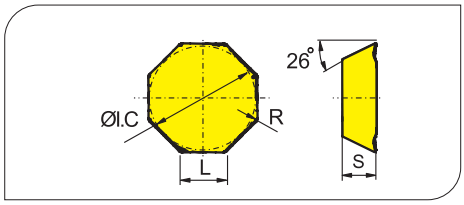
Spare parts

Diameter ØD	Locator	Wedge	Wedge screw	Locator screw	Wrench
					
Ø125-Ø315	LOF07R/L	W02R/L	DM8×21X	LOM5×15.1	WT20T WH40T

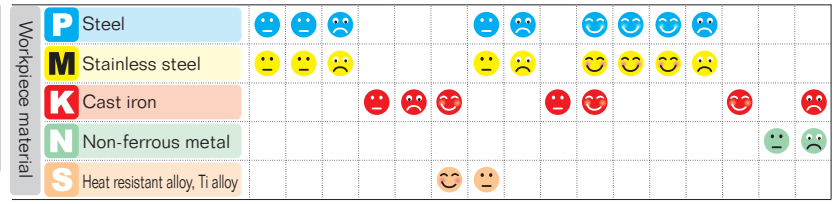


Applicable tool D14-D18 Tools code key B20-B21 Grade selection guide B15-B19 Technical data B164-B170

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	I.C	S	R	YBC301	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**OFKR0704-DF**	7.45	17.94	4.76	0.8		●					☆									
	**OFKR0704-DM**	7.45	17.94	4.76	0.8	●	●	●		☆	☆	★	★								

★Recommended grade and always stock available ☆Recommended grade and produce according to order
●Available grade and always stock available ○Available grade and produce according to order

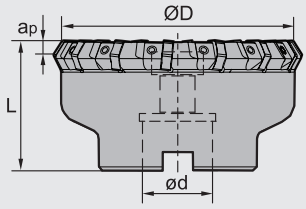
Chipbreaker selection for FMA04 milling inserts

Classification / Function	For finishing	For semi-finishing
P	-DF	-DM
M		
K		

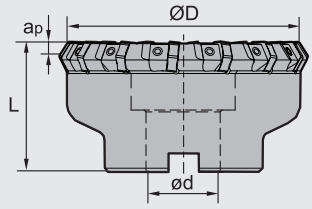
Face milling tools Kr:55°

FMD02 K

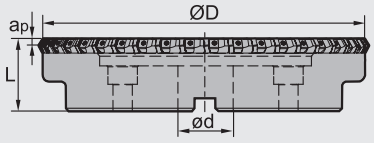
A type of coupling



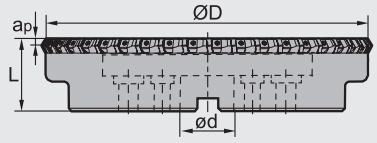
B type of coupling



C type of coupling



D type of coupling



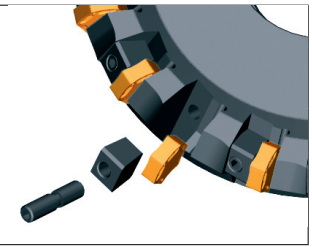
Specification of tools

Type		Stock		Basic dimensions(mm)				Number of teeth Z	Type of coupling	Weight (kg)
		R	L	ØD	ød	L	apmax			
FMD02	**-080-A27-HN09-08**	▲	△	80	27	50	6	8	A	1.1
	-100-B32-HN09-10	▲	△	100	32	63	6	10	B	2.6
	-125-B40-HN09-14	▲	△	125	40	70	6	14	B	3.7
	-160-B40-HN09-18	▲	△	160	40	63	6	18	B	5.6
	-200-C60-HN09-22	▲	△	200	60	63	6	22	C	6.3
	-250-C60-HN09-28	▲	△	250	60	63	6	28	C	10.3
	-315-D60-HN09-32	▲	△	315	60	63	6	32	D	21.7

▲Stock available △Produce according to order

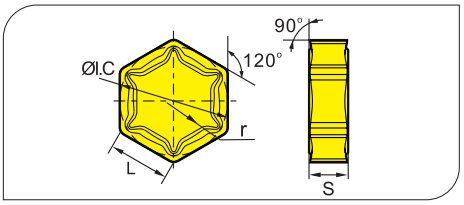
Spare parts

Diameter ØD	Wedge	Wedge screw	Wrench
			
Ø80-Ø315	W06T	DM6×25	WH30T

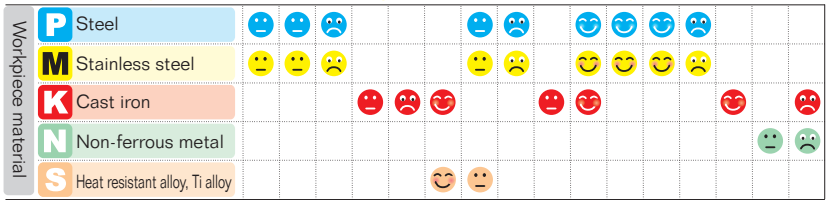


Applicable tool D14-D18 Tools code key B20-B21 Grade selection guide B15-B19 Technical data B164-B170

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	I.C	S	r	YBC301	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**HNEX090512-DF**	9.16	15.875	5.56	1.2				★												
	**HNEX090512-DM**	9.16	15.875	5.56	1.2				★												
	**HNEX090512-DR**	9.16	15.875	5.56	1.2				☆	★											

★Recommended grade and always stock available ☆Recommended grade and produce according to order
●Available grade and always stock available ○Available grade and produce according to order

Chipbreaker selection for FMD02 milling inserts

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

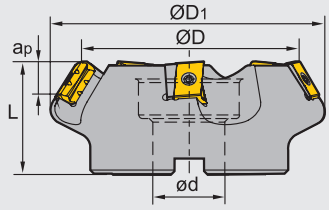
Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters			
				V(m/min)	f(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)

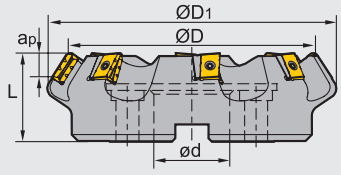
Face milling tools Kr:60°

FMD03 P M

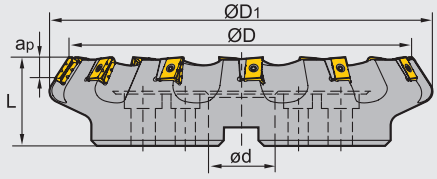
B type of coupling



C type of coupling



D type of coupling



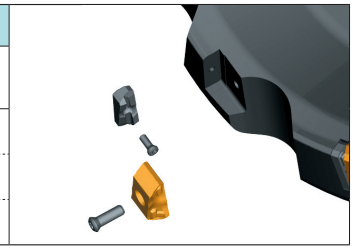
Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
			ØD	ØD1	ød	L	apmax			
FMD03	**-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 △Produce according to order

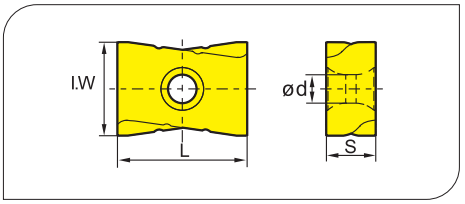
Spare parts

Diameter ØD	Insert screw	Shim	Shim screw	Wrench	
					
Ø125-Ø400	I60M5×17	LLN25R-ZR	I60M3.5×10.4	WT15IS	WT20IT

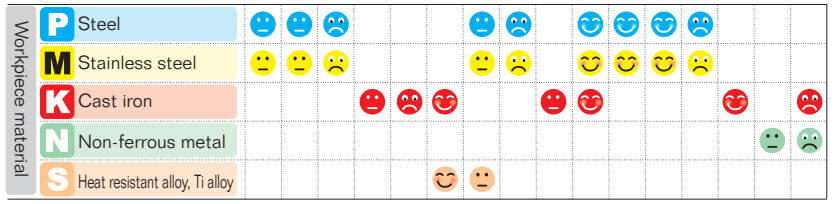


Applicable tool D14-D18 Tools code key B20-B21 Grade selection guide B15-B19 Technical data B164-B170

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	I.W	S	d		YBC301	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**LNKT2510-ZR**	25	18	9.525	5.5				○					★								

★Recommended grade and always stock available ☆Recommended grade and produce according to order
●Available grade and always stock available ○Available grade and produce according to order

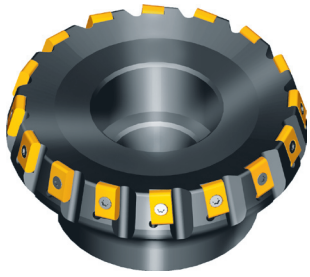
Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				V(m/min)	f(mm/z)
P	Low-carbon steel、Soft steel	⩽180	YBG302	180 (150-300)	0.5 (0.2-0.8)
			YBM351	180 (150-300)	0.5 (0.2-0.8)
	High-carbon steel、Alloy steel	180-280	YBG302	150 (120-280)	0.5 (0.2-0.8)
			YBM351	140 (120-280)	0.5 (0.2-0.8)
	Alloy tool steel	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)

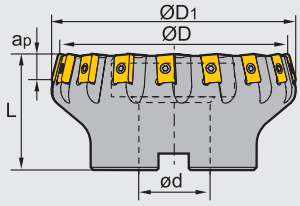
Note: please adjust the cutting parameters stated above according to machine Max. power

Face milling tools Kr:75°

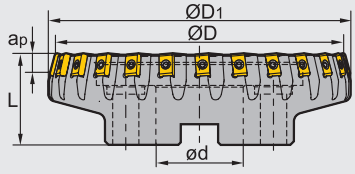
FME01 K



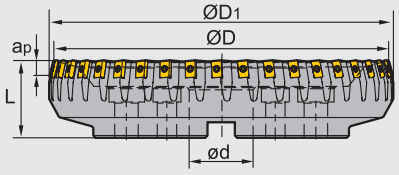
B type of coupling



C type of coupling



D type of coupling



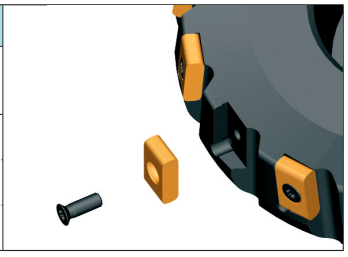
Specification of tools

Type		Stock		Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
		R	L	ØD	ØD1	ød	L	apmax			
FME01	-125-B40-LN15-16	△	△	125	132	40	63	8	16	B	3.5
	-160-B40-LN15-20	△	△	160	168	40	63	8	20	B	6.1
	-200-C60-LN15-25	△	△	200	208	60	63	8	25	C	7.4
	-250-C60-LN15-32	△	△	250	257	60	63	8	32	C	13.1
	-315-D60-LN15-40	△	△	315	323	60	70	8	40	D	25.5

▲Stock available △Produce according to order

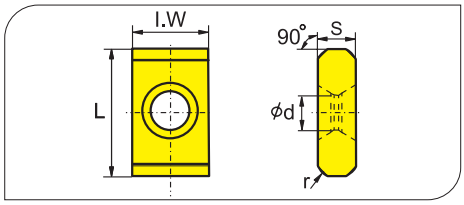
Spare parts

Diameter ØD	Insert screw	Wrench
		
Ø125-Ø315	I90M4×11	WT09S

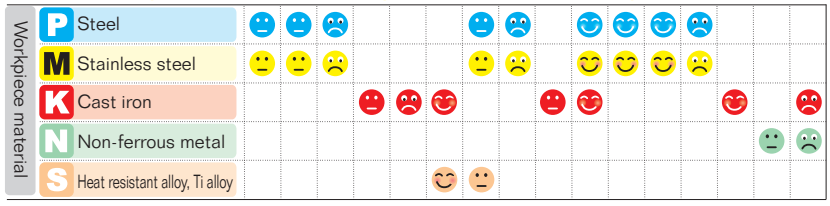


Applicable tool D14-D18 Tools code key B20-B21 Grade selection guide B15-B19 Technical data B164-B170

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	I.W	S	d	r	YBC301	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**LNE32.534**	15.875	9.525	4.76	4.4	1.6				★												

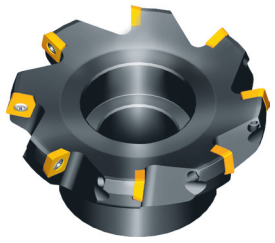
★Recommended grade and always stock available ☆Recommended grade and produce according to order
●Available grade and always stock available ○Available grade and produce according to order

Recommended cutting parameters

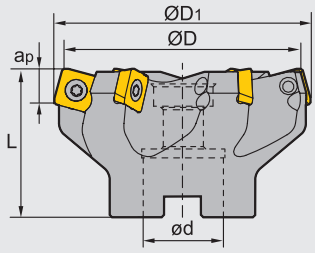
Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				V(m/min)	f(mm/z)
K	Cast iron	180-250	YBD152	150 (110-190)	0.2 (0.1-0.4)

Face milling tools Kr:75°

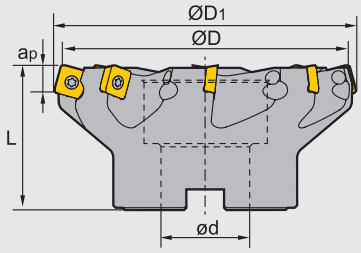
FME02 P M K



A type of coupling



B type of 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

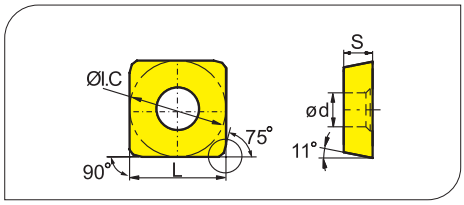
▲Stock available △Produce according to order

Spare parts

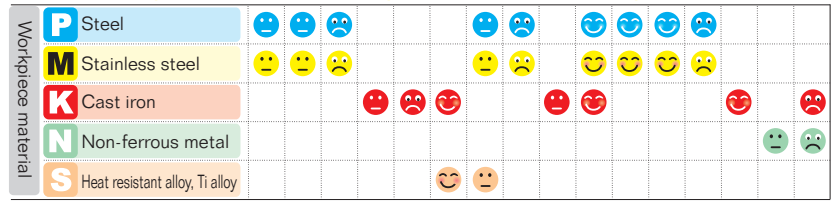
Diameter ØD	Insert screw	Wrench	
			
Ø50-Ø125	I60M5×13.2	WT20IS	

Applicable tool D14-D18 Tools code key B20-B21 Grade selection guide B15-B19 Technical data B164-B170

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	I.C	S	d	YBC301	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SPKW1204EDFR	12.7	12.7	4.76	5.56							☆									
	SPKW1204EDSR	12.7	12.7	4.76	5.56							☆									
	SPKT1204EDR	12.7	12.7	4.76	5.56							★									

★Recommended grade and always stock available ☆Recommended grade and produce according to order
●Available grade and always stock available ○Available grade and produce according 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	

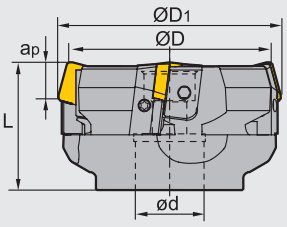
Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				V(m/min)	f(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)

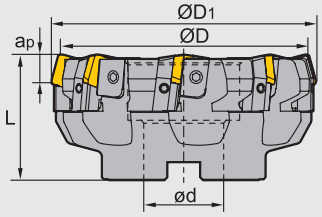
Face milling tools Kr:75°

FME03 P M K

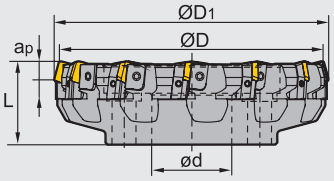
A type of coupling



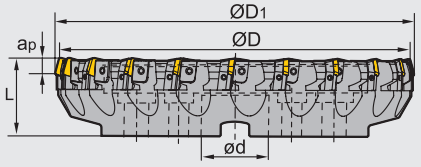
B type of coupling



C type of coupling



D type of coupling



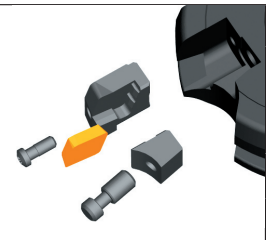
Specification of tools

Type		Stock		Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
		R	L	ØD	ØD1	ød	L	apmax			
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 △Produce according to order

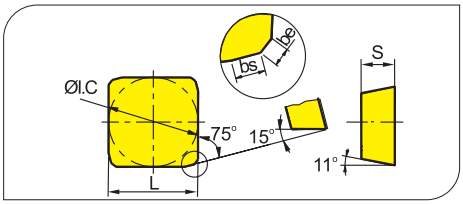
Spare parts

Diameter ØD	Insert	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		

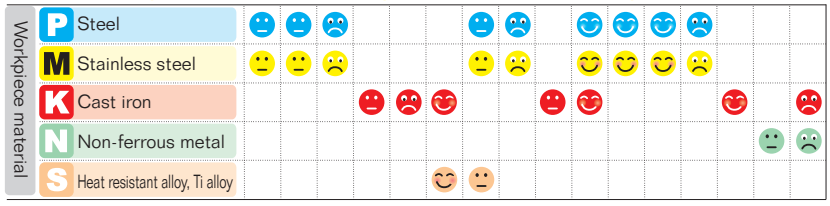


Applicable tool D14-D18 Tools code key B20-B21 Grade selection guide B15-B19 Technical data B164-B170

Selection of inserts



Good working condition Normal working condition Bad working condition

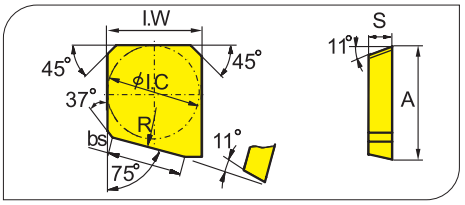


Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating					Cermet		Cemented carbide			
		L	I.C	S	be	bs	YBC301	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SPKN1203EDER	12.7	12.7	3.18	1	1.4							☆									
	SPKN1203EDEL	12.7	12.7	3.18	1	1.4							☆									
	SPKN1203EDFR	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		●					★	★					●			●

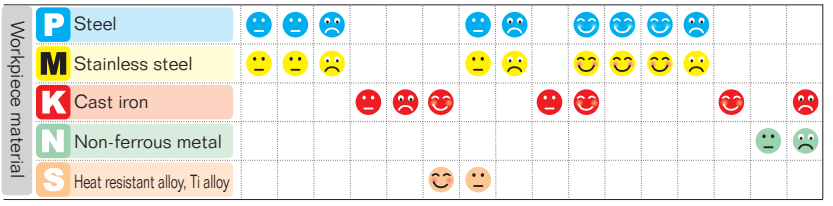
★Recommended grade and always stock available ☆Recommended grade and produce according to order
●Available grade and always stock available ○Available grade and produce according to order

Order guide: **SPKN1203EDT3 1R** chamfering angle 20°, chamfering width 0.15mm. if order other edge shape, see the 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	I.C	I.W	S	bs	R	YBC301	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
Wiper inserts 	**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														○		●

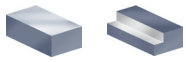
★Recommended grade and always stock available ☆Recommended grade and produce according to order

●Available grade and always stock available ○Available grade and produce according to order

Cutting edge treatment selection for FME03 milling inserts

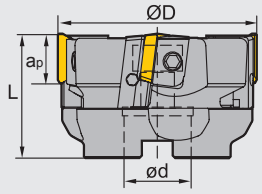
Treatment method of cutting edge	Recommended selection
SP□□EDER/L	Honing edge is suitable for semi-finish and finish machining steel and stainless steel.
SP□□EDFR/L	Sharp cutting edge is suitable for finish machining cast iron materials.
SP□□EDSKR/L **SP□□EDS□□R/L**	After chamfering and honing, the edge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

Face milling tools Kr:90°

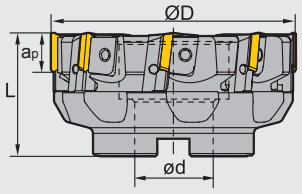


FMP01 P M K

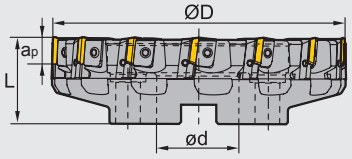
A type of coupling



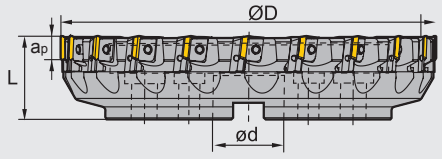
B type of coupling



C type of coupling



D type of coupling



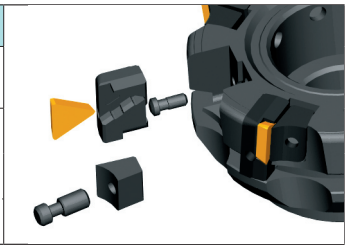
Specification of tools

Type		Stock		Basic dimensions(mm)				Number of teeth Z	Type of coupling	Weight (kg)
		R	L	ØD	ød	L	apmax			
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 △Produce according to order

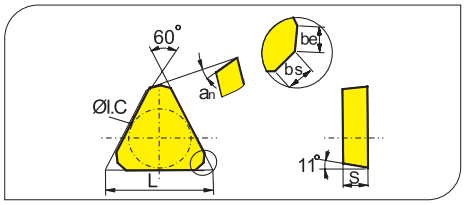
Spare parts

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



Applicable tool D14-D18 Tools code key B20-B21 Grade selection guide B15-B19 Technical data B164-B170

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

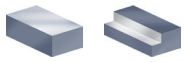
Insert shape	Type	Basic dimensions(mm)						CVD Coating					PVD Coating					Cermet		Cemented carbide			
		L	I.C	S	be	bs	an	YBC301	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	TPKN2204PDFR	22	12.7	4.76	0.7	1.4	15°						☆										○
	TPKN2204PDFL	22	12.7	4.76	0.7	1.4	15°						☆										○
	TPKN2204PDR	22	12.7	4.76	0.7	1.4	15°	●		●			★	★	★					●	○	○	●
	TPKN2204PDL	22	12.7	4.76	0.7	1.4	15°													●			
	TPKN2204PDTR	22	12.7	4.76	0.7	1.4	15°	●												●			
	TPKN2204PDTL	22	12.7	4.76	0.7	1.4	15°	○												○			

★Recommended grade and always stock available ☆Recommended grade and produce according to order
●Available grade and always stock available ○Available grade and produce according to order

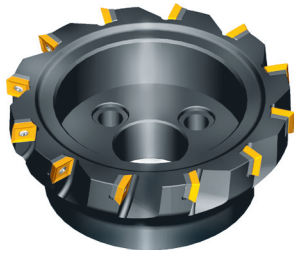
Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				V(m/min)	f(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)

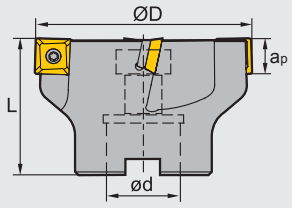
Face milling tools Kr:90°



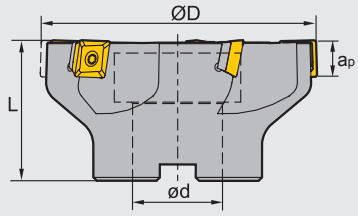
FMP02 P M K



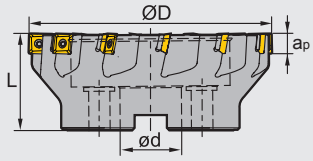
A type of coupling



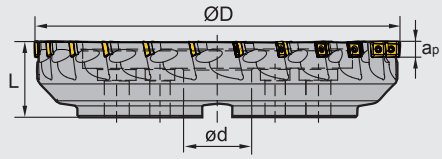
B type of coupling



C type of coupling



D type of coupling



Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth Z	Type of coupling	Weight (kg)
			ØD	ød	L	a_{pmax}			
FMP02	**-050-A22-SE09-05**	▲	50	22	40	6.7	5	A	0.3
	-063-A22-SE09-06	▲	63	22	40	6.7	6	A	0.5
	-080-A27-SE09-08	▲	80	27	50	6.7	8	A	0.9
	-100-B32-SE09-08	▲	100	32	50	6.7	8	B	1.7
	-100-B32-SE09-10	△	100	32	50	6.7	10	B	1.7
	-125-B40-SE09-12	△	125	40	63	6.7	12	B	2.6

▲Stock available △Produce according to order

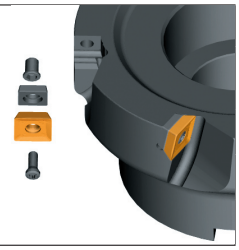
Applicable tool D14-D18 Tools code key B20-B21 Grade selection guide B15-B19 Technical data B164-B170

Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth Z	Type of coupling	Weight (kg)
			ØD	ød	L	a_{pmax}			
FMP02	**-050-A22-SE12-03**	▲	50	22	40	10.8	3	A	0.3
	-063-A22-SE12-04	▲	63	22	40	10.8	4	A	0.4
	-080-A27-SE12-04	▲	80	27	50	10.8	4	A	0.9
	-100-B32-SE12-05	▲	100	32	50	10.8	5	B	1.2
	-125-B40-SE12-06	▲	125	40	63	10.8	6	B	3.1
	-160-C40-SE12-08	▲	160	40	63	10.8	8	C	4.1
	-250-C60-SE12-12	▲	250	60	63	10.8	12	C	11.1
	-050-A22-SE12-04	▲	50	22	40	10.8	4	A	0.3
	-063-A22-SE12-05	▲	63	22	40	10.8	5	A	0.4
	-080-A27-SE12-06	▲	80	27	50	10.8	6	A	0.8
	-100-B32-SE12-07	▲	100	32	50	10.8	7	B	1.2
	-125-B40-SE12-08	▲	125	40	63	10.8	8	B	3.0
	-160-C40-SE12-12	▲	160	40	63	10.8	12	C	3.9
	-050-A22-SE12-05	▲	50	22	40	10.8	5	A	0.2
	-063-A22-SE12-06	▲	63	22	40	10.8	6	A	0.4
	-080-A27-SE12-08	▲	80	27	50	10.8	8	A	0.8
	-100-B32-SE12-10	▲	100	32	50	10.8	10	B	1.2
	-125-B40-SE12-12	▲	125	40	63	10.8	12	B	2.9
	-200-C60-SE12-16	▲	200	60	63	10.8	16	C	6.1
	-250-C60-SE12-18	▲	250	60	63	10.8	18	C	10.9
	-315-D60-SE12-24	▲	315	60	63	10.8	24	D	21.6

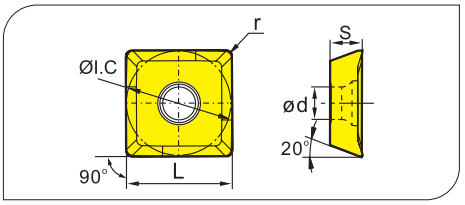
▲Stock available △Produce according to order

Spare parts

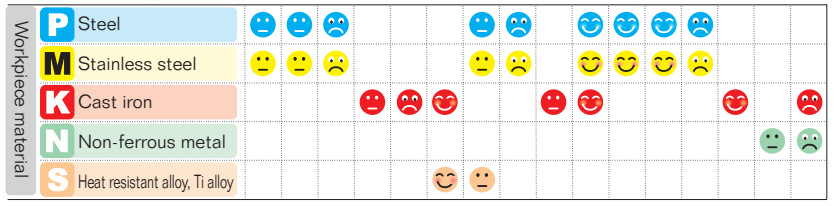
Diameter ØD	Inserts	Shim	Insert screw	Shim screw	Wrench	Wrench	
							
Ø50 ~ Ø125	SE09	--	I60M3×7	--	WT09IS	--	
Ø50	SE12	--	I60M3.5×10	--	WT15IS	--	
Ø63 ~ Ø315		S12BSX	I60M3.5×12	SM5×7XA		WH35L	

Applicable tool D14-D18 Tools code key B20-B21 Grade selection guide B15-B19 Technical data B164-B170

Selection of inserts



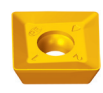
Good working condition Normal working condition Bad working condition



Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating					Cermet		Cemented carbide				
		L	I.C	S	d	r	YBC301	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SEET09T308PER-PF	9.525	9.525	4.01	3.3	0.8							★									
	SEET09T308PER-PM	9.525	9.525	4.01	3.3	0.8				☆			★									
	SEET09T308PER-PR	9.525	9.525	4.01	3.3	0.8				★			☆									
	SEET120308PER-PF	13.308	13.308	4.04	4.1	0.8							☆									
	SEET120308PER-PM	13.308	13.308	4.04	4.1	0.8		●			★	★	★	★								
	SEET120308PER-PR	13.308	13.308	4.04	4.1	0.8			○			★	★	★								

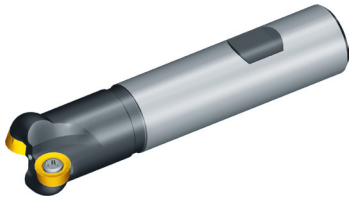
★Recommended grade and always stock available ☆Recommended grade and produce according to order
●Available grade and always stock available ○Available grade and produce according to order

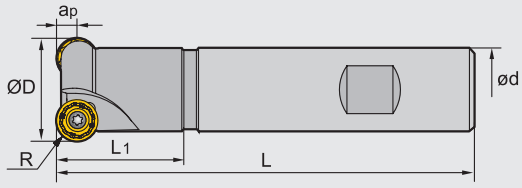
Chipbreaker selection for FMP02 milling inserts

Classification / Function	For finishing	For semi-finishing	For roughing
P	PF 	PM 	PR 
M			
K			

Face milling tools

FMR01 P M K





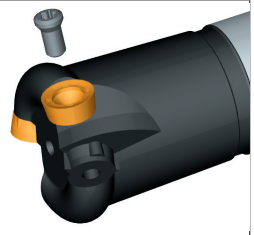
Specification of tools

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 △Produce according to order

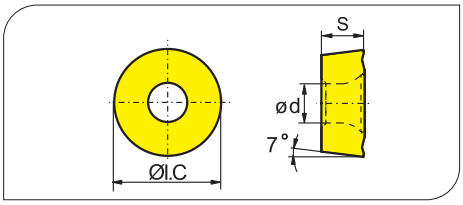
Spare parts

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

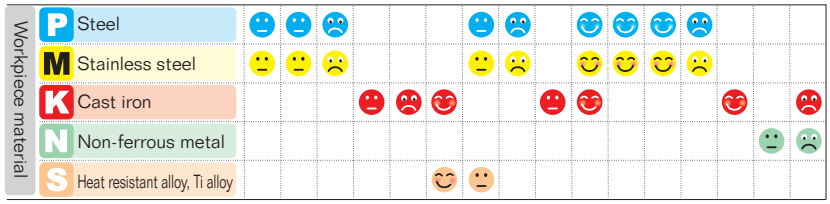


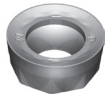
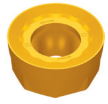
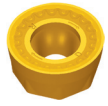
Applicable tool D11-D13 Tools code key B20-B21 Grade selection guide B15-B19 Technical data B164-B170

Selection of inserts



Good working condition Normal working condition Bad working condition



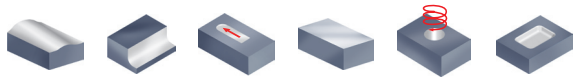
Insert shape	Type	Basic dimensions(mm)				CVD Coating					PVD Coating					Cermet		Cemented carbide			
		R	I.C	S	d	YBC301	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	RCKT10T3MO-DM	5	10.0	3.97	4.4	●						★									
	RCKT1204MO-DM	6	12.0	4.76	4.0	●	●	●	☆			★	★								
	RCKT1204MO-DR	6	12.0	4.76	4.0	○	○	○				★									

★Recommended grade and always stock available ☆Recommended grade and produce according to order
●Available grade and always stock available ○Available grade and produce according to order

Recommended cutting parameters

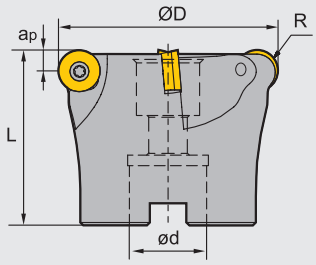
Workpiece material		Hardness HB	Insert grade	Cutting parameters		
				V(m/min)	f(mm/z)	
					-DM	-DR
P	Low-carbon steel、Soft steel	⩽180	YBM251 YBC301	270 (220-350)	0.2(0.1-0.5)	0.3 (0.2-0.8)
			YBM351 YBC302	220 (180-300)	0.25(0.1-0.5)	0.3 (0.2-0.8)
			YBG202	270 (200-360)	0.2(0.1-0.5)	0.3 (0.2-0.8)
	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)
			YBG202	240 (180-350)	0.2(0.1-0.5)	0.3 (0.2-0.8)
	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)
			YBG202	220 (170-340)	0.2(0.1-0.4)	0.3 (0.2-0.6)
M	Stainless steel	⩽270	YBM251	150 (120-240)	0.2(0.1-0.4)	0.3 (0.2-0.6)
			YBM351	150 (100-220)	0.2(0.1-0.4)	0.3 (0.2-0.6)
			YBG202	160 (110-270)	0.2(0.1-0.4)	0.3 (0.2-0.6)
K	Cast iron	180-250	YBG302	210 (120-300)	0.2(0.1-0.5)	0.3 (0.2-0.8)

Face milling tools

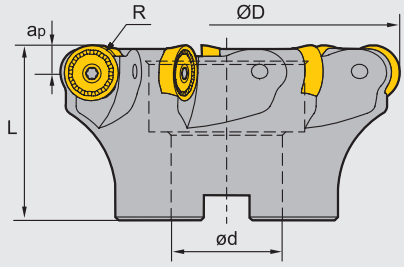


FMR02 P M K

A type of coupling



B type of coupling



Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
			ØD	ød	L	R	apmax			
FMR02	**063-A22-RC12-04**	▲	63	22	50	6	6	4	A	0.7
	080-B27-RC16-05	▲	80	27	50	8	8	5	B	0.7
	100-B32-RC16-06	▲	100	32	63	8	8	6	B	1.2
	125-B40-RC20-07	△	125	40	63	10	10	7	B	2.2
	160-B40-RC20-08	△	160	40	63	10	10	8	B	4.2

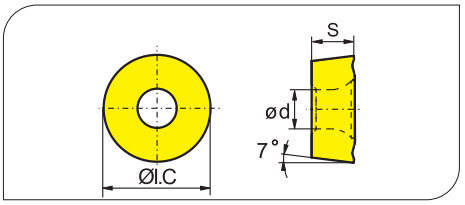
▲Stock available △Produce according to order

Spare parts

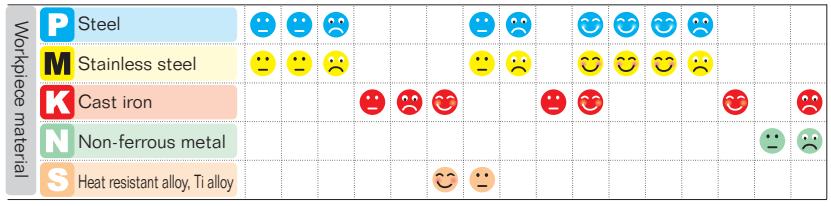
Diameter ØD	Insert screw	Wrench	
			
Ø63	I60M3.5×10	WT15IS	--
Ø80 -Ø100	I60M5×13	--	WT20IT
Ø125 -Ø160	I43M6×16	--	WT25IT

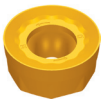
Applicable tool D14-D18 Tools code key B20-B21 Grade selection guide B15-B19 Technical data B164-B170

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			
		R	I.C	S	d	YBC301	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**RCKT1204MO-DM**	6	12.0	4.76	4.0	●	●	●	☆			★	★								
	RCKT1204MO-DR	6	12.0	4.76	4.0	○	○	○				★									
	RCKT1606MO-DM	8	16	6.35	5.56	●							★								
	RCKT1606MO-DR	8	16	6.35	5.56	●		●		☆		★									
	RCKT2006MO-DR	10	20	6.35	6.55	●		●		☆		☆	☆								

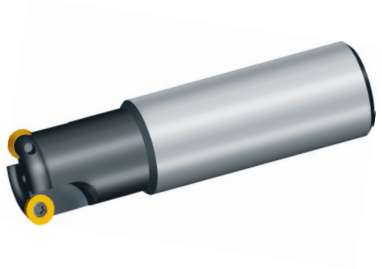
★Recommended grade and always stock available ☆Recommended grade and produce according to order
●Available grade and always stock available ○Available grade and produce according to order

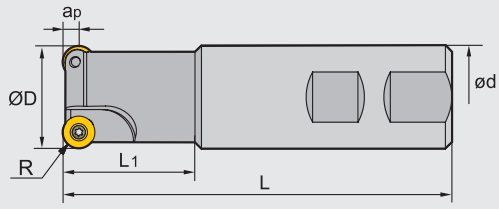
Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters		
				V(m/min)	f(mm/z)	
					-DM	-DR
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 YBG302	220 (180-300)	0.25(0.1-0.5)	0.3 (0.2-0.8)
			YBG202	270 (200-360)	0.2(0.1-0.5)	0.3 (0.2-0.8)
	High-carbon steel、Alloy steel	180-280	YBM251 YBC301	240 (200-320)	0.2(0.1-0.5)	0.3 (0.2-0.8)
			YBM351 YBG302	200 (160-280)	0.25(0.1-0.5)	0.3 (0.2-0.8)
			YBG202	240 (180-350)	0.2(0.1-0.5)	0.3 (0.2-0.8)
	Alloy tool steel	280-350	YBM251 YBC301	220 (180-300)	0.2(0.1-0.4)	0.3 (0.2-0.6)
			YBM351 YBG302	180 (150-250)	0.2(0.1-0.5)	0.3 (0.2-0.8)
			YBG202	220 (170-340)	0.2(0.1-0.4)	0.3 (0.2-0.6)
M	Stainless steel	⩽270	YBM251	150 (120-240)	0.2(0.1-0.4)	0.3 (0.2-0.6)
			YBM351	150 (100-220)	0.2(0.1-0.4)	0.3 (0.2-0.6)
			YBG202	160 (110-270)	0.2(0.1-0.4)	0.3 (0.2-0.6)
K	Cast iron	180-250	YBG302	210 (120-300)	0.2(0.1-0.5)	0.3 (0.2-0.8)

Face milling tools

FMR03 P M K



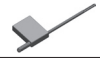


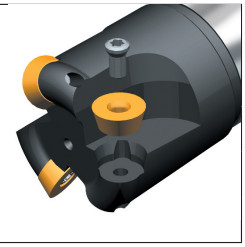
Specification of tools

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 △Produce according to order

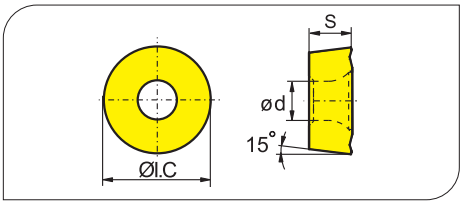
Spare parts

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

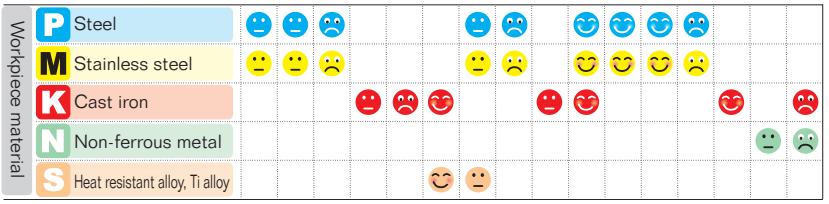


Applicable tool D11-D13 Tools code key B20-B21 Grade selection guide B15-B19 Technical data B164-B170

Selection of inserts



Good working condition Normal working condition Bad working condition



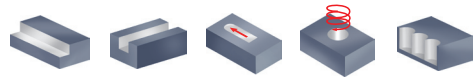
Insert shape	Type	Basic dimensions(mm)				CVD Coating					PVD Coating					Cermet		Cemented carbide			
		R	I.C	S	d	YBC301	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	RDKW0803MO	4	8	3.18	3.4	○		○				★	☆								
	RDKW10T3MO	5	10	3.97	4.4	○		●				★									
	RDKW1204MO	6	12	4.76	4.4	●	●	●				★	★								

★Recommended grade and always stock available ☆Recommended grade and produce according to order
●Available grade and always stock available ○Available grade and produce according to order

Recommended cutting parameters

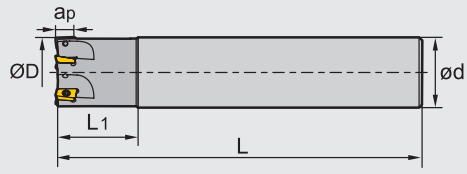
Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				V(m/min)	f(mm/z)
P	Low-carbon steel、Soft steel	⩽180	YBM251 YBC301	270 (220-350)	0.2 (0.08-0.45)
			YBM351 YBG302	220 (180-300)	0.25 (0.15-0.45)
			YBG202	270 (200-360)	0.2 (0.1-0.45)
	High-carbon steel、Alloy steel	180-280	YBM251 YBC301	240 (200-320)	0.2 (0.08-0.45)
			YBM351 YBG302	200 (160-280)	0.25 (0.15-0.45)
			YBG202	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	220 (170-340)	0.2 (0.1-0.45)
M	Stainless steel	⩽270	YBM251	150 (120-240)	0.2 (0.08-0.45)
			YBM351	150 (100-220)	0.25 (0.1-0.45)
			YBG202	160 (110-270)	0.2 (0.1-0.45)
K	Cast iron	180-250	YBG302	210 (120-300)	0.2 (0.1-0.45)

Square shoulder milling tools Kr:90°



EMP01 P M K N

Straight shank



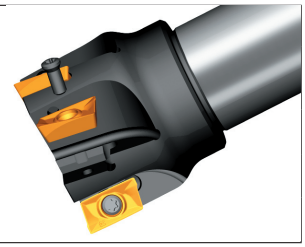
Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Weight (kg)
			ØD	ød	L	L_1	a_{pmax}		
EMP01 Straight shank	**012-G16-AP11-01**	▲	12	16	85	25	10.5	1	0.1
	016-G16-AP11-02	▲	16	16	90	25	10.5	2	0.1
	020-G20-AP11-02	▲	20	20	100	30	10.5	2	0.2
	025-G25-AP11-03	▲	25	25	115	35	10.5	3	0.4
	032-G32-AP11-04	▲	32	32	125	40	10.5	4	0.7
	025-G25-AP16-02	▲	25	25	115	35	15.5	2	0.4
	032-G32-AP16-03	▲	32	32	125	40	15.5	3	0.7
	040-G32-AP16-04	▲	40	32	130	42	15.5	4	0.8
	050-G32-AP16-05	▲	50	32	135	45	15.5	5	1.0
	063-G32-AP16-06	▲	63	32	135	45	15.5	6	1.4

▲Stock available △Produce according to order

Spare parts

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

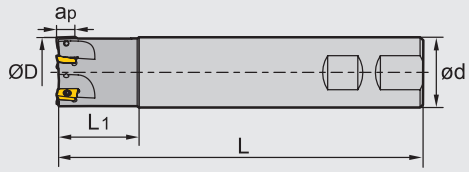


Applicable tool D9-D10 Tools code key B20-B21 Grade selection guide B15-B19 Technical data B164-B170

Square shoulder milling tools Kr:90°

EMP01 P M K N

Weldon shank



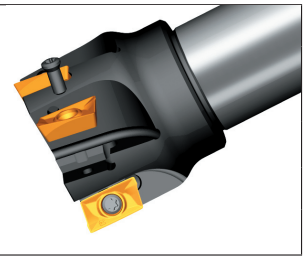
Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Weight (kg)
			ØD	ød	L	L1	apmax		
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 △Produce according to order

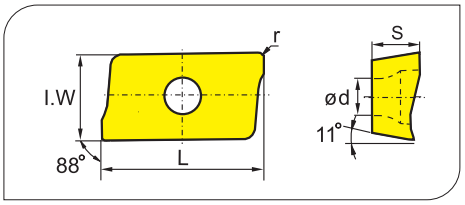
Spare parts

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

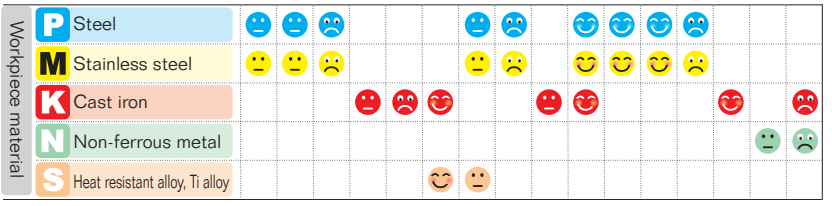


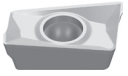
Applicable tool D11-D13 Tools code key B20-B21 Grade selection guide B15-B19 Technical data B164-B170

Selection of inserts



Good working condition Normal working condition Bad working condition



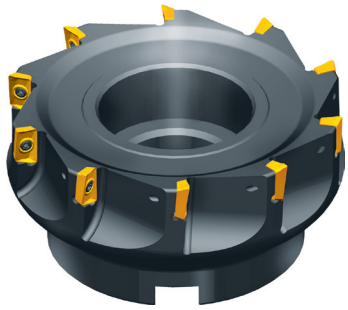
Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating					Cermet		Cemented carbide				
		L	I.W	S	d	r	YBC301	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	APKT11T304-PF	12.24	6.5	3.6	2.8	0.4	●	○	○			☆	☆	☆								
	APKT11T308-PF	12.24	6.5	3.6	2.8	0.8		○				☆	☆									
	APKT11T312-PF	12.24	6.5	3.6	2.8	1.2							☆									
	APKT11T316-PF	12.24	6.5	3.6	2.8	1.6							☆									
	APKT160408-PF	17.877	9.33	5.76	4.4	0.8	●	○	○				☆	☆								
	APKT11T304-PM	12.24	6.5	3.6	2.8	0.4	●	●	●			★	★	★								
	APKT11T308-PM	12.24	6.5	3.6	2.8	0.8	●	●	○		★	★	★	★								
	APKT11T312-PM	12.24	6.5	3.6	2.8	1.2		○				☆	★	☆								
	APKT11T316-PM	12.24	6.5	3.6	2.8	1.6		○				☆	★	☆								
	APKT160408-PM	17.877	9.33	5.76	4.4	0.8	●	●	●		☆	★	★	★								
	APKT11T304-PR	12.24	6.5	3.6	2.8	0.4	●	●	●			☆	☆	☆								
	APKT11T308-PR	12.24	6.5	3.6	2.8	0.8								☆								
	APKT11T312-PR	12.24	6.5	3.6	2.8	1.2								☆								
	APKT11T316-PR	12.24	6.5	3.6	2.8	1.6								☆								
	APKT160408-PR	17.877	9.33	5.76	4.4	0.8								☆								
	APKT11T304-LH	12.24	6.5	3.6	2.8	0.4															★	★
	APKT11T308-LH	12.24	6.5	3.6	2.8	0.8															★	☆
	APKT160408-LH	17.877	9.33	5.76	4.4	0.8															★	★

★Recommended grade and always stock available ☆Recommended grade and produce according to order
●Available grade and always stock available ○Available grade and produce according to order

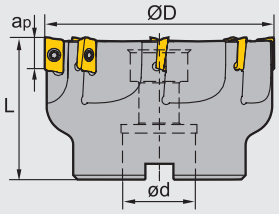
Square shoulder milling tools

Kr:90°

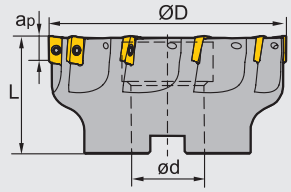
EMP02 P M K N



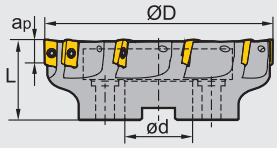
A type of coupling



B type of coupling



C type of coupling



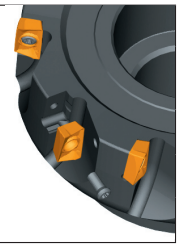
Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth Z	Type of coupling	Weight (kg)
			ØD	ød	L	a_{pmax}			
EMP02	**050-A22-AP11-06**	▲	50	22	40	11	6	A	0.3
	063-A22-AP11-08	▲	63	22	40	11	8	A	0.6
	080-A27-AP11-08	▲	80	27	50	11	8	A	1.2
	100-B32-AP11-10	▲	100	32	50	11	10	B	1.7
	050-A22-AP16-05	▲	50	22	40	15.5	5	A	0.3
	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
	200-C60-AP16-12	▲	200	60	63	15.5	12	C	8.1
	250-C60-AP16-12	▲	250	60	63	15.5	12	C	11.2

▲Stock available △Produce according to order

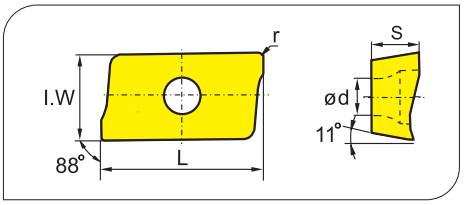
Spare parts

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



Applicable tool D14-D18 Tools code key B20-B21 Grade selection guide B15-B19 Technical data B164-B170

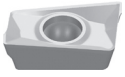
Selection of inserts



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

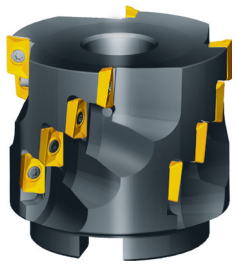
Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating					Cermet		Cemented carbide			
		L	I.W	S	d	r	YBC301	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	APKT11T304-PF	12.24	6.5	3.6	2.8	0.4	●	○	○			☆	☆	☆								
	APKT11T308-PF	12.24	6.5	3.6	2.8	0.8		○				☆	☆									
	APKT11T312-PF	12.24	6.5	3.6	2.8	1.2							☆									
	APKT11T316-PF	12.24	6.5	3.6	2.8	1.6							☆									
	APKT160408-PF	17.877	9.33	5.76	4.4	0.8	●	○	○				☆	☆								
	APKT11T304-PM	12.24	6.5	3.6	2.8	0.4	●	●	●			★	★	★								
	APKT11T308-PM	12.24	6.5	3.6	2.8	0.8	●	●	○		★	★	★	★								
	APKT11T312-PM	12.24	6.5	3.6	2.8	1.2		○				☆	★	☆								
	APKT11T316-PM	12.24	6.5	3.6	2.8	1.6		○				☆	★	☆								
	APKT160408-PM	17.877	9.33	5.76	4.4	0.8	●	●	●		☆	★	★	★								
	APKT11T304-PR	12.24	6.5	3.6	2.8	0.4	●	●	●			☆	☆	☆								
	APKT11T308-PR	12.24	6.5	3.6	2.8	0.8								☆								
	APKT11T312-PR	12.24	6.5	3.6	2.8	1.2								☆								
	APKT11T316-PR	12.24	6.5	3.6	2.8	1.6								☆								
	APKT160408-PR	17.877	9.33	5.76	4.4	0.8								☆								
	APKT11T304-LH	12.24	6.5	3.6	2.8	0.4															★	★
	APKT11T308-LH	12.24	6.5	3.6	2.8	0.8															★	☆
	APKT160408-LH	17.877	9.33	5.76	4.4	0.8															★	★

★Recommended grade and always stock available ☆Recommended grade and produce according to order
●Available grade and always stock available ○Available grade and produce according to order

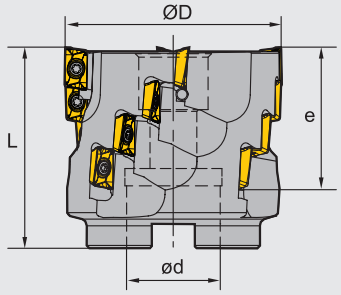
Square shoulder milling tools

Kr:90°

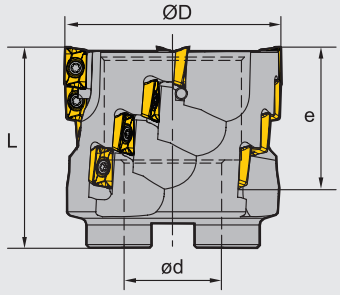
EMP03 P M K N



A type of coupling



B type of coupling



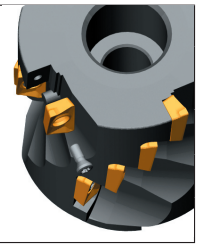
Specification of tools

Type		Stock	Basic dimensions(mm)				Flute number z	Number of insert	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 △Produce according to order

Spare parts

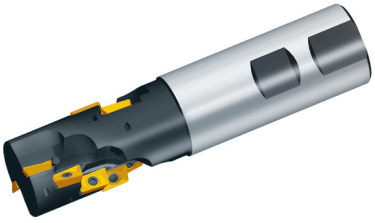
Diameter ØD	Screw	Wrench
		
Ø50-Ø100	I60M2.5×6.5T	WT08IS



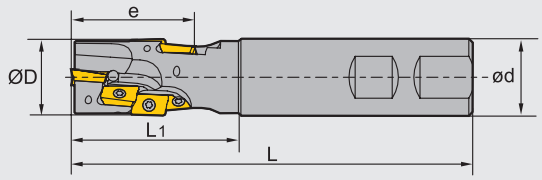
Applicable tool D14-D18 Tools code key B20-B21 Grade selection guide B15-B19 Technical data B164-B170

Square shoulder milling tools Kr:90°

EMP04 P M K N



Weldon shank



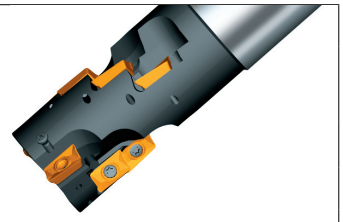
Specification of tools

Type		Stock	Basic dimensions(mm)					Flute number z	Number of insert	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 △Produce according to order

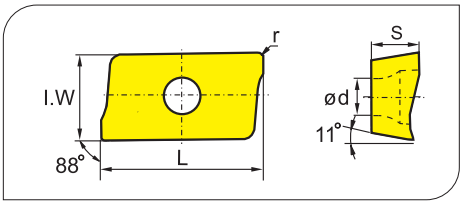
Spare parts

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

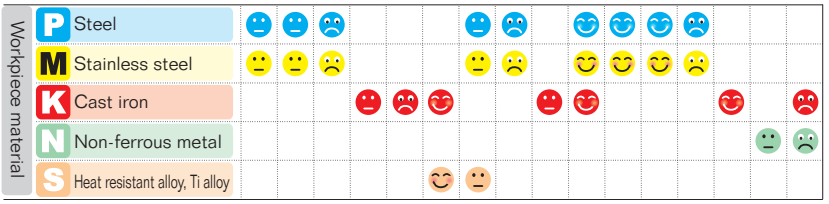


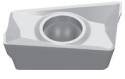
Applicable tool D11-D13 Tools code key B20-B21 Grade selection guide B15-B19 Technical data B164-B170

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	d	r	YBC301	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	APKT11T304-PF	12.24	6.5	3.6	2.8	0.4	●	○	○			☆	☆	☆								
	APKT11T308-PF	12.24	6.5	3.6	2.8	0.8		○				☆	☆									
	APKT11T312-PF	12.24	6.5	3.6	2.8	1.2							☆									
	APKT11T316-PF	12.24	6.5	3.6	2.8	1.6							☆									
	APKT11T304-PM	12.24	6.5	3.6	2.8	0.4	●	●	●			★	★	★								
	APKT11T308-PM	12.24	6.5	3.6	2.8	0.8	●	●	○		★	★	★	★								
	APKT11T312-PM	12.24	6.5	3.6	2.8	1.2		○				☆	★	☆								
	APKT11T316-PM	12.24	6.5	3.6	2.8	1.6		○				☆	★	☆								
	APKT11T304-PR	12.24	6.5	3.6	2.8	0.4	●	●	●			☆	☆	☆								
	APKT11T308-PR	12.24	6.5	3.6	2.8	0.8								☆								
	APKT11T312-PR	12.24	6.5	3.6	2.8	1.2								☆								
	APKT11T316-PR	12.24	6.5	3.6	2.8	1.6								☆								
	APKT11T304-LH	12.24	6.5	3.6	2.8	0.4															★	★
	APKT11T308-LH	12.24	6.5	3.6	2.8	0.8															★	☆

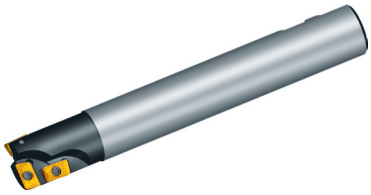
★Recommended grade and always stock available ☆Recommended grade and produce according to order
●Available grade and always stock available ○Available grade and produce according to order

Chipbreaker selection

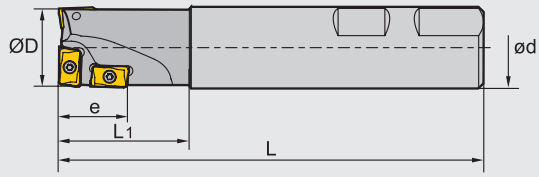
Classification / Function	For finishing	For semi-finishing	For roughing
P	-PF	-PM	-PR
M	-PF	-PM	-PR
K	-PF	-PM	
AL	-LH		

Square shoulder milling tools Kr:90°

EMP05 P M K



Weldon shank



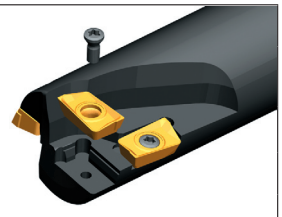
Specification of tools

Type		Stock	Basic dimensions(mm)					Number of insert		Weight (kg)
		R	ØD	ød	L	L_1	e	APMT11	APMT16	
EMP05	**-025-XP25**	▲	25	25	130	40	20	3	--	0.5
	-032-XP32	▲	32	32	140	50	30	1	2	0.8
	-040-XP32	▲	40	32	150	60	40	--	4	1.0

▲Stock available △Produce according to order

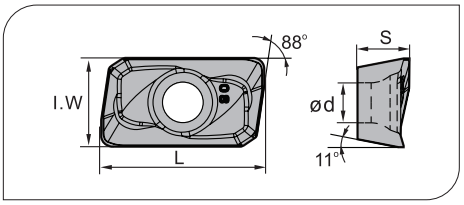
Spare parts

Diameter ØD	Insert	Screw	Wrench
			
Ø25-Ø40	APMT11	I60M2.5×6.5T	WT08IP
	APMT16	I60M4×10	WT15IP

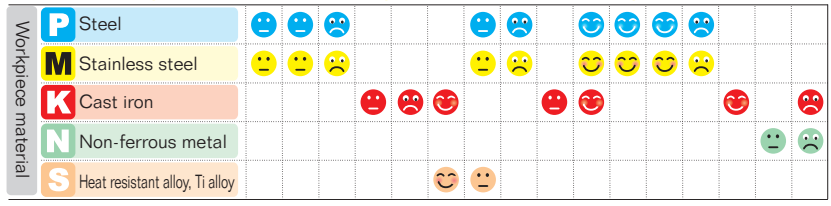


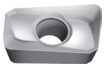
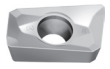
Applicable tool D11-D13 Tools code key B20-B21 Grade selection guide B15-B19 Technical data B164-B170

Selection of inserts



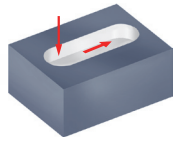
Good working condition Normal working condition Bad working condition



Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating					Cermet		Cemented carbide				
		L	I.W	S	d	r	YBC301	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	APMT1135PDR	11.25	6.2	3.5	2.8	0.8		○				☆	★	☆								
	APMT160408PDER	17.25	9.25	4.76	4.4	0.8							★	☆								

★Recommended grade and always stock available ☆Recommended grade and produce according to order
●Available grade and always stock available ○Available grade and produce according to order

1 Drilling



Recommended cutting parameters

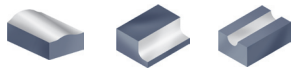
Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				V(m/min)	f(mm/z)
P	Low-carbon steel、Soft steel	≤180	YBG202	180 (150-220)	0.2 (0.08-0.25)
P	High-carbon steel、Alloy steel	180-280	YBG202	160 (130-200)	0.15 (0.08-0.2)
P	Alloy tool steel	280-350	YBG202	140 (120-180)	0.12 (0.05-0.2)
M	Stainless steel	≤270	YBG202	80 (50-150)	0.08 (0.03-0.15)
K	Cast iron	180-250	YBG202	150 (100-220)	0.15 (0.08-0.2)

2 Milling

Recommended cutting parameters

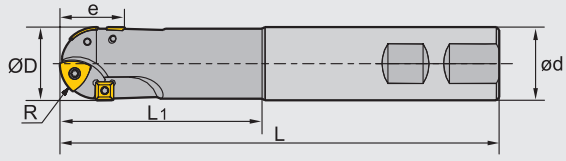
Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				V(m/min)	f(mm/z)
P	Low-carbon steel、Soft steel	≤180	YBG202	190 (140-250)	0.08 (0.04-0.15)
P	High-carbon steel、Alloy steel	180-280	YBG202	170 (130-250)	0.08 (0.04-0.15)
P	Alloy tool steel	280-350	YBG202	150 (110-240)	0.08 (0.04-0.15)
M	Stainless steel	≤270	YBG202	120 (80-190)	0.08 (0.04-0.15)
K	Cast iron	180-250	YBG202	120 (80-210)	0.08 (0.04-0.15)

Profile milling tools



BMR01 P M K

Weldon shank



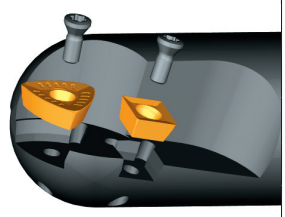
Specification of tools

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 △Produce according to order

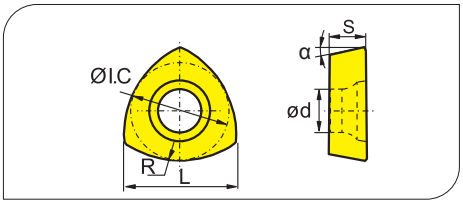
Spare parts

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



Applicable tool D11-D13 Tools code key B20-B21 Grade selection guide B15-B19 Technical data B164-B170

Selection of inserts



Good working condition Normal working condition Bad working condition

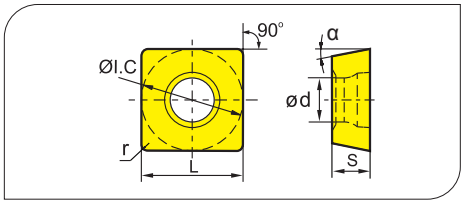
Workpiece material

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	I.C	S	d	α	YBC301	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	ZDET08T2CYR10	10	8.4	6.75	2.78	2.8	14°		○						☆								
	ZDET1103CYR12.5	12.5	10.6	8.5	3.18	2.8	14°		○						☆								
	ZDET13T3CYR16	16	13.2	10.5	3.97	4.4	14°		○						☆								
	ZPNT2204CY(R20)	20	16.1	12.7	4.76	5.56	11°		○						☆								
	ZPNT2204CY(R25)	25	16.9	12.7	4.76	5.56	11°		○						☆								
	ZPNT2204CY(R31)	31.5	17.6	12.7	4.76	5.56	11°		○						☆								

★Recommended grade and always stock available ☆Recommended grade and produce according to order
●Available grade and always stock available ○Available grade and produce according 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			
		r	L	I.C	S	d	α	YBC301	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SPMT060304	0.4	6.35	6.35	3.18	2.8	11°		○						☆								
	SDMT090308	0.8	9.525	9.525	3.18	4.4	15°		○						☆								
	SPMT120408	0.8	12.7	12.70	4.76	5.5	11°		●						★								

★Recommended grade and always stock available ☆Recommended grade and produce according to order
●Available grade and always stock available ○Available grade and produce according to order

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	160	45	0.3
	-016-G20-M	▲	8	16	20	170	65	0.3
	-016-G20-L	▲	8	16	20	200	65	0.4
	-020-G25-S	▲	10	20	25	160	60	0.5
	-020-G25-M	▲	10	20	25	200	80	0.6
	-020-G25-L	▲	10	20	25	240	80	0.8

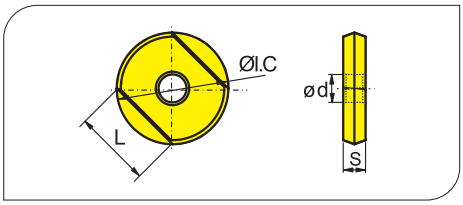
▲Stock available △Produce according to order

Spare parts

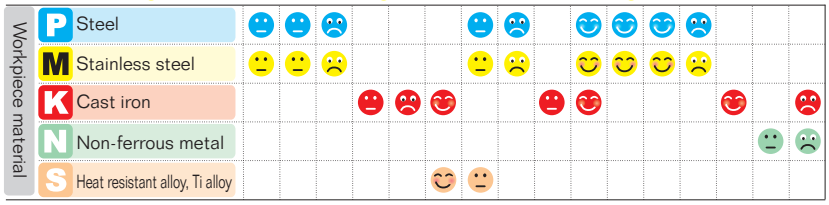
Diameter ØD	Screw	Wrench
		
Ø12	I90M4×09TT	WT10S
Ø16	I90M5×11TT	WT15S
Ø20	I90M5×13.5TT	WT15S

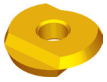
Applicable tool D9-D10 Tools code key B20-B21 Grade selection guide B15-B19 Technical data B164-B170

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.C	L	S	d	YBC301	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**ROHX1203**	12	8.5	3	4										☆						
	ROHX1604	16	11.3	4	5										☆						
	ROHX2005	20	14.1	5	5										☆						

★Recommended grade and always stock available ☆Recommended grade and produce according to order
●Available grade and always stock available ○Available grade and produce according to order

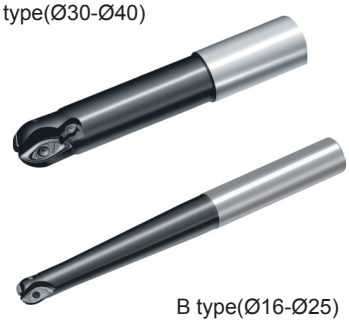
Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters	Diameter		
					Ø12	Ø16	Ø20
P	Carbon Steel	HB≤180	YBG252	V(m/min)	100~200	100~200	100~200
				f_z(mm/z)	0.15~0.25	0.2~0.3	0.2~0.3
				a_{pmax}(mm)	0.8	1	1.25
				a_{emax}(mm)	0.8	1	1.25
	Alloy steel	HB180~280		V(m/min)	80~180	80~180	80~180
				f_z(mm/z)	0.15~0.25	0.2~0.3	0.2~0.3
				a_{pmax}(mm)	0.8	1	1.25
				a_{emax}(mm)	0.8	1	1.25
	Hardened steel	HRC55~65		V(m/min)	60~100	60~100	60~100
				f_z(mm/z)	0.15~0.25	0.2~0.3	0.2~0.3
				a_{pmax}(mm)	0.4	0.5	0.6
				a_{emax}(mm)	0.4	0.5	0.6
M	Stainless steel	HB≤270		V(m/min)	70~150	70~150	70~150
				f_z(mm/z)	0.1~0.2	0.1~0.25	0.1~0.25
				a_{pmax}(mm)	0.6	0.8	1
				a_{emax}(mm)	0.6	0.8	1
K	Cast iron	HB180-250		V(m/min)	160~300	160~300	160~300
				f_z(mm/z)	0.2~0.3	0.25~0.35	0.25~0.35
				a_{pmax}(mm)	1	1.5	1.8
				a_{emax}(mm)	1	1.5	1.8

Profile milling tools

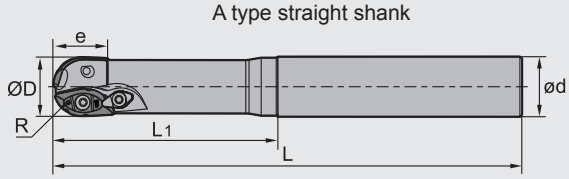
BMR03 P M K

A type(Ø30-Ø40)

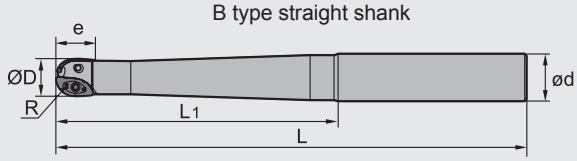


B type(Ø16-Ø25)

A type straight shank



B type straight shank



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	
	-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	WD-208
	-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	
	-040-G40-M	▲	20	40	40	250	150	40	2	2.0	A	CBH5R1
	-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	

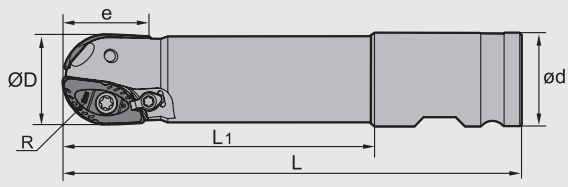
▲Stock available △Produce according to order

Applicable tool D9-D10 Tools code key B20-B21 Grade selection guide B15-B19 Technical data B164-B170

Profile milling tools

BMR03 P M K

Compound shank



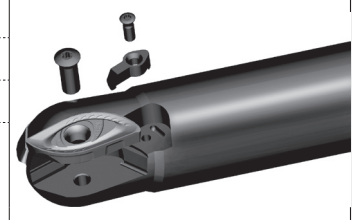
Specification of tools

Type		Stock	Basic dimensions(mm)						Number of teeth Z	Weight (kg)	Clamp
			R	ØD	ød	L	L_1	e			
BMR03	**-040-XPX-M**	▲	20	40	50.8	250	170	40	2	1.3	CBH5R1
	-040-XPX-L	▲	20	40	50.8	300	220	40	2	3.1	
	-040-XPX-XL	▲	20	40	50.8	350	270	40	2	3.5	
	-050-XPX-M	▲	25	50	50.8	250	170	50	2	3.1	
	-050-XPX-L	▲	25	50	50.8	300	200	50	2	3.8	
	-050-XPX-XL	▲	25	50	50.8	350	270	50	2	4.4	

▲Stock available △Produce according to order

Spare parts

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

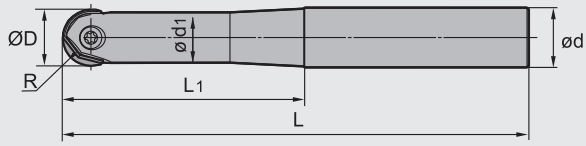


Tools code key B20-B21 Grade selection guide B15-B19 Technical data B164-B170

Profile milling tools

BMR04 P M K

Straight shank with taper neck



Specification of tools

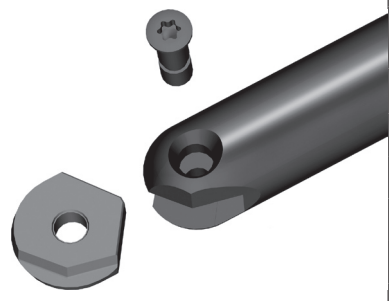
Type		Stock	Basic dimensions(mm)						Weight (kg)
			R	ØD	ød	ød1	L1	L	
BMR04	**-012-G16-M**	▲	6	12	16	11	50	125	0.2
	-012-G16-L	△	6	12	16	11	70	150	0.2
	-016-G20-M	▲	8	16	20	14	60	150	0.3
	-016-G20-L	△	8	16	20	14	80	180	0.3
	-020-G25-M	▲	10	20	25	18	75	180	0.6
	-020-G25-L	△	10	20	25	18	95	200	0.6
	-025-G32-M	▲	12.5	25	32	23	90	200	1.0
	-025-G32-L	△	12.5	25	32	23	110	250	1.3
	-030-G40-M	▲	15	30	40	27	110	250	2.0
	-030-G40-L	△	15	30	40	27	125	300	2.4
	-032-G40-M	▲	16	32	40	29	110	250	2.0
	-032-G40-L	△	16	32	40	29	125	300	2.4

▲Stock available △Produce according to order

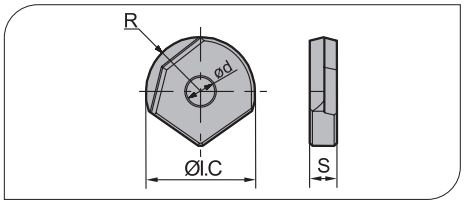
Applicable tool D9-D10 Tools code key B20-B21 Grade selection guide B15-B19 Technical data B164-B170

Spare parts

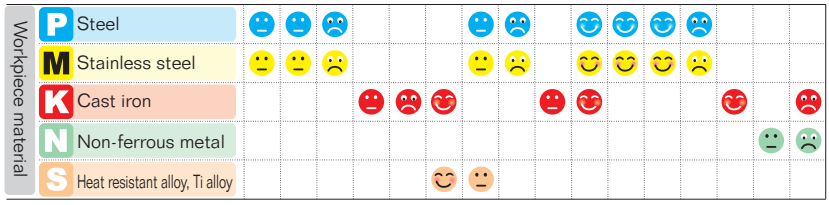
Diameter	Screw	Wrench	
			
Ø12	I70M4×10TT	WT15IP	--
Ø16	I70M5×12TT	WT20IP	--
Ø20	I70M5×16TT	WT20IP	--
Ø25	I70M6×20TT	WT20IP	--
Ø30	I70M8×25TT	--	WT30IT
Ø32	I70M8×25TT	--	WT30IT

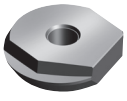
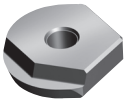


Selection of inserts



Good working condition Normal working condition Bad working condition

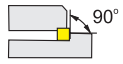
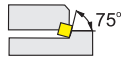
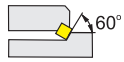
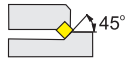
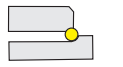


Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating					Cermet		Cemented carbide			
		R	I.C	S	d	Applicable insert ØD	YBC301	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	ZOHX1203-GF	6	12	3	4	Φ12										★						
	ZOHX1604-GF	8	16	4	5	Φ16										★						
	ZOHX2005-GF	10	20	5	5	Φ20										★						
	ZOHX2506-GF	12.5	25	6	6	Φ25										☆						
	ZOHX3007-GF	15	30	7	8	Φ30										☆						
	ZOHX3207-GF	16	32	7	8	Φ32										☆						
	ZOHX1203-GM	6	12	3	4	Φ12										★						
	ZOHX1604-GM	8	16	4	5	Φ16										★						
	ZOHX2005-GM	10	20	5	5	Φ20										★						
	ZOHX2506-GM	12.5	25	6	6	Φ25										★						
	ZOHX3007-GM	15	30	7	8	Φ30										★						
	ZOHX3207-GM	16	32	7	8	Φ32										★						

★Recommended grade and always stock available ☆Recommended grade and produce according to order
●Available grade and always stock available ○Available grade and produce according to order

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

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

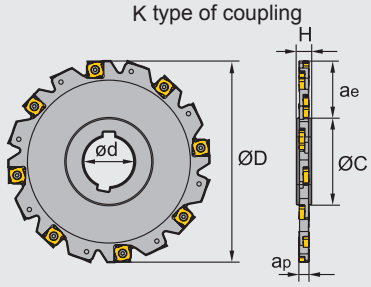
(R: Right L: Left)

Number of teeth

Side and face milling tools

SMP01 P M K

K type of coupling



Specification of tools

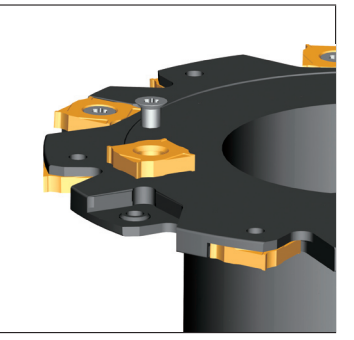
Type		Stock		Basic dimensions(mm)						Applicable inserts	Number of teeth Z	Type of coupling	Weight (kg)
		R	L	ØD	ød	øc	H	a_p	a_{emax}				
SMP01 Mounting by keyway	-100×4-K27-SN12-10	△	△	100	27	40.7	12	4	25	XSEQ1202	10	K	0.2
	-125×4-K40-SN12-12	△	△	125	40	50.5	12	4	32		12	K	0.3
	-160×4-K40-SN12-16	△	△	160	40	66.7	12	4	44		16	K	0.5
	-100×5-K27-SN12-10	△	△	100	27	45	12	5	25	XSEQ1203	10	K	0.2
	-125×5-K40-SN12-12	△	△	125	40	58	12	5	31		12	K	0.3
	-160×5-K40-SN12-16	△	△	160	40	68	12	5	44		16	K	0.6
	-100×6-K27-SN12-10	△	△	100	27	45	12	6	25	XSEQ12T3	10	K	0.3
	-125×6-K40-SN12-12	△	△	125	40	58	12	6	31		12	K	0.4
	-160×6-K40-SN12-16	△	△	160	40	68	12	6	44		16	K	0.7
	-200×6-K50-SN12-18	△	△	200	50	67.7	12	6	62		18	K	1.1
	-250×6-K50-SN12-24	△	△	250	50	72	12	6	87		24	K	1.7
	-100×7-K27-SN12-10	△	△	100	27	45	12	7	25	XSEQ1204	10	K	0.3
	-125×7-K40-SN12-12	△	△	125	40	58	12	7	31		12	K	0.4
	-160×7-K40-SN12-16	△	△	160	40	68	12	7	44		16	K	0.8
	-200×7-K50-SN12-18	△	△	200	50	72	12	7	62		18	K	1.2
	-250×7-K50-SN12-24	△	△	250	50	72	12	7	87		24	K	1.9
	-100×8-K27-SN12-10	△	△	100	27	45	12	8	25	XSEQ12T4	10	K	0.3
	-125×8-K40-SN12-12	△	△	125	40	58	12	8	31		12	K	0.5
	-160×8-K40-SN12-16	△	△	160	40	68	12	8	44		16	K	0.9
	-200×8-K50-SN12-18	△	△	200	50	72	12	8	62		18	K	1.4
	-250×8-K50-SN12-24	△	△	250	50	72	12	8	87		24	K	2.2

▲Stock available △Produce according to order

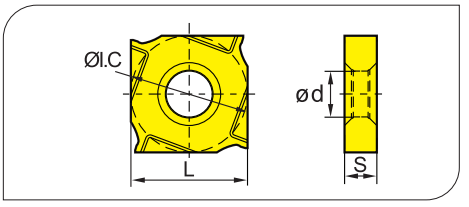
Applicable tool D23-D24 Tools code key B111 Grade selection guide B15-B19 Technical data B164-B170

Spare parts

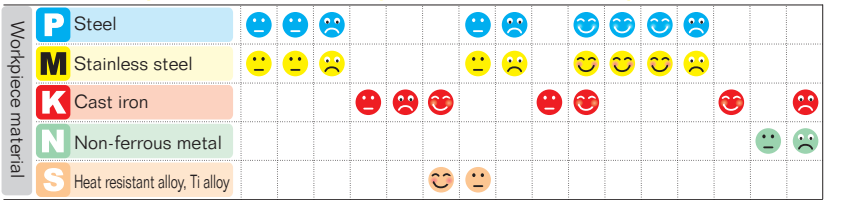
Diameter ØD	Cutting width a_p	Screw	Wrench
Ø63-Ø160	4	I91M4×3.3X	WT10S
Ø63-Ø160	5	I91M4×4.3X	
Ø63-Ø250	6	I91M4×5.3X	
Ø63-Ø250	7	I91M4×6.3X	
Ø63-Ø250	8	I91M4×7.3X	



Selection of inserts



Good working condition Normal working condition Bad working condition

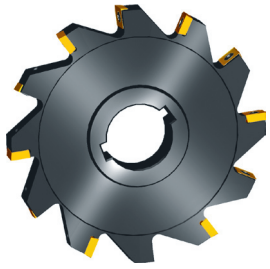


Insert shape	Type	Basic dimensions(mm)				CVD Coating					PVD Coating					Cermet		Cemented carbide			
		I.C	L	S	d	YBC301	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**XSEQ1202**	12.7	12.7	2.6	5.0								★								
	XSEQ1203	12.7	12.7	3.0	5.0								★								
	XSEQ12T3	12.7	12.7	3.8	5.0								★								
	XSEQ1204	12.7	12.7	4.0	5.0								★								
	XSEQ12T4	12.7	12.7	4.8	5.0								★								

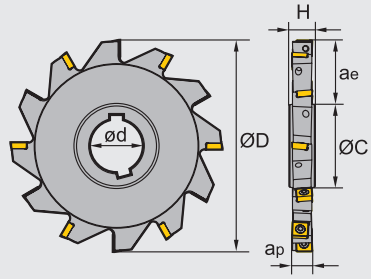
★Recommended grade and always stock available ☆Recommended grade and produce according to order
●Available grade and always stock available ○Available grade and produce according to order

Side and face milling tools

SMP03 P M K



K type of coupling

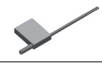


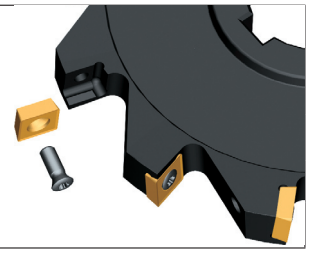
Specification of tools

Type		Stock		Basic dimensions(mm)						Applicable inserts	Number of teeth Z	Type of coupling	Weight (kg)
		R	L	ØD	øc	ød	a_{emax}	a_p	H				
SMP03 Mounting by keyway	**-080×8-K27-MP06-10**	△	△	80	41	27	17	8	12	MPHT060304-DM	10	K	0.2
	-100×8-K32-MP06-14	△	△	100	47	32	25	8	12		14	K	0.3
	-100×10-K32-MP06-14	△	△	100	47	32	25	10	14		14	K	0.4
	-125×10-K40-MP06-16	△	△	125	55	40	34	10	14		16	K	0.6
	-125×12-K40-MP08-12	△	△	125	55	40	34	12	16	MPHT080305-DM	12	K	0.7
	-160×12-K40-MP08-14	△	△	160	62	40	47	12	16		14	K	1.3
	-160×16-K40-MP12-12	△	△	160	62	40	49	16	20	MPHT120408-DM	12	K	1.6
	-160×18-K40-MP12-12	△	△	160	62	40	49	18	24		12	K	1.9
	-160×20-K40-MP12-12	△	△	160	62	40	49	18	26		12	K	2.1
	-200×16-K50-MP12-14	△	△	200	72	50	62	16	20		14	K	2.5
	-200×18-K50-MP12-14	△	△	200	72	50	62	18	24		14	K	2.9
	-200×20-K50-MP12-14	△	△	200	72	50	63	20	26		14	K	3.3

▲Stock available △Produce according to order

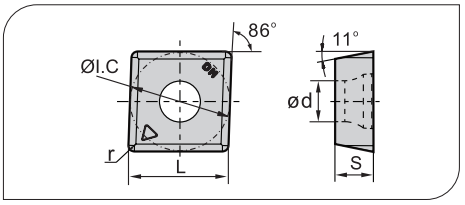
Spare parts

Diameter ØD	Insert	Screw	Wrench	
				
Ø80-Ø125	MP06	I60M2.5x6.5	WT07IP	
Ø125-Ø160	MP08	I60M3x7	WT09P	
Ø160-Ø200	MP12	I60M5x13		WT20IS

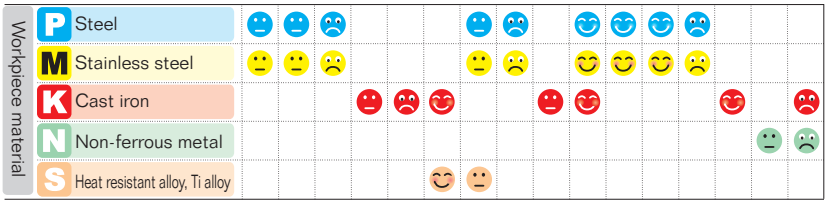


Applicable tool D23-D24 Tools code key B111 Grade selection guide B15-B19 Technical data B164-B170

Selection of inserts



Good working condition Normal working condition Bad working condition



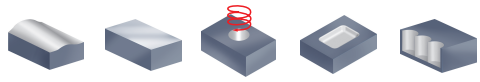
Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating					Cermet		Cemented carbide				
		I.C	L	S	d	r	YBC301	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**MPHT060304-DM**	6.35	6.35	3.18	2.8	0.4								★								
	MPHT080305-DM	8.3	8.3	3.18	5.56	0.5								★								
	MPHT120408-DM	12.7	12.7	4.76	5.56	0.8								★								

★Recommended grade and always stock available ☆Recommended grade and produce according to order
●Available grade and always stock available ○Available grade and produce according to order

Recommended cutting parameters

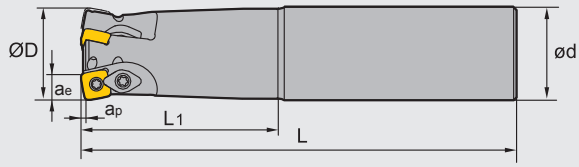
Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				V(m/min)	f(mm/z)
P	Low-carbon steel、Soft steel	⩽180	YBG202	180 (100-250)	0.1(0.08-0.25)
			YBG302	150 (100-200)	0.15(0.1-0.3)
	High-carbon steel、Alloy steel	180-280	YBG202	150 (80-250)	0.1(0.08-0.25)
			YBG302	120 (80-200)	0.15(0.1-0.3)
	Alloy tool steel	280-350	YBG202	120 (80-250)	0.1(0.08-0.25)
			YBG302	100 (80-200)	0.15(0.1-0.3)
M	Stainless steel	⩽270	YBG202	120 (80-250)	0.1(0.05-0.15)
			YBG302	100 (80-200)	0.08(0.05-0.15)
K	Cast iron	180-250	YBG152	120 (80-250)	0.1(0.05-0.15)
			YBG302	150 (100-250)	0.08(0.05-0.15)

High feed milling cutters



XMR01 P M K

S type insert, straight shank



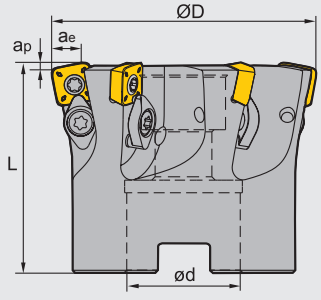
Specification of tools

Type		Stock	Basic dimensions(mm)						Number of teeth Z	Weight (kg)
			ØD	a_p	a_e	L_1	L	ød		
XMR01	-025-G25-SD09-02	▲	25	1.4	8.8	60	140	25	2	0.5
	-032-G32-SD09-03	▲	32	1.4	8.8	70	150	32	3	0.8
	-035-G32-SD09-03	▲	35	1.4	8.8	70	150	32	3	0.8
	-032-G32-SD12-02	▲	32	1.8	11.7	70	150	32	2	0.8
	-040-G40-SD12-03	▲	40	1.8	11.7	70	150	40	3	1.3

▲Stock available △Produce according to order

XMR01 P M K

S 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-SD09-04	▲	50	1.4	8.8	40	22	4	A	0.3
	-063-A22-SD09-06	▲	63	1.4	8.8	40	22	6	A	0.5
	-063-A27-SD09-06	▲	63	1.4	8.8	50	27	6	A	0.6
	-063-A22-SD12-05	▲	63	1.8	11.7	40	22	5	A	0.5
	-063-A27-SD12-05	▲	63	1.8	11.7	50	27	5	A	0.6
	-080-A27-SD12-05	▲	80	1.8	11.7	63	27	5	A	0.9
	-100-B32-SD12-06	▲	100	1.8	11.7	50	32	6	B	1.8

▲Stock available △Produce according to order

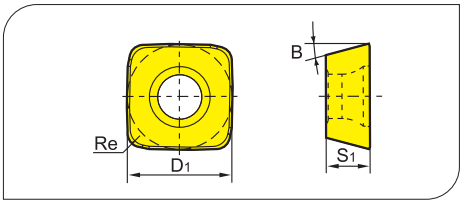
Applicable tool D9-10/D14-18 Tools code key B20-B21 Grade selection guide B15-B19 Technical data B164-B170

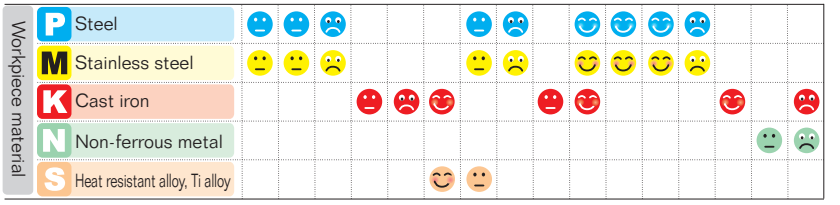
Spare parts

Tool type	Insert Screw	Clamp Screw	Clamp	Wrench	
					
XMR01□□-SD09□□	I60M3.5×08TT	I60M4×8.4	WD-204	WT10IP	WT15IP
XMR01□□-SD12□□	I60M4×8.4			WT15IP	

Selection of inserts

Good working condition Normal working condition Bad working condition

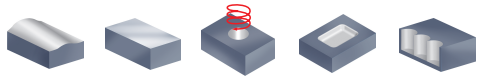




Insert shape	Type	Basic dimensions(mm)				CVD Coating					PVD Coating					Cermet		Cemented carbide			
		B	Re	S_1	D_1	YBC301	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**SDMT09T312-DM**	15°	1.2	3.97	9.525			★					☆								
	SDMT120412-DM	15°	2.0	4.76	12.7			★					☆								

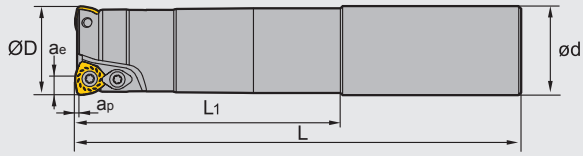
★Recommended grade and always stock available ☆Recommended grade and produce according to order
●Available grade and always stock available ○Available grade and produce according to order

High feed milling cutters



XMR01 P M K

W type insert, straight shank

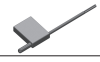


Specification of tools

Type		Stock	Basic dimensions(mm)						Number of teeth Z	Weight (kg)
			ØD	ap	ae	L1	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

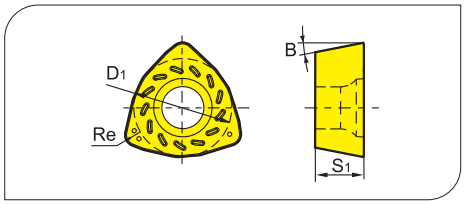
▲Stock available △Produce according to order

Spare parts

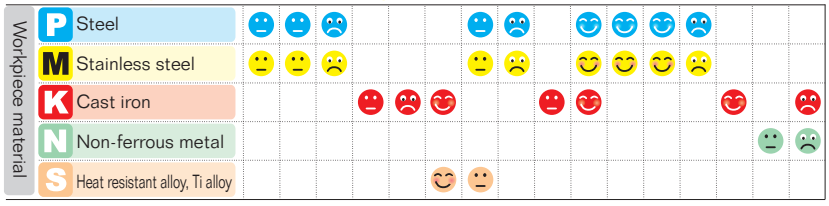
Tool type	Clamp/Insert screw	Clamp	Wrench	
				
XMR01□□-WP05□□	I60M3.5×08TT	--	WT10P	--
XMR01□□-WP06□□	I60M4×8.4		WT15P	
XMR01□□-WP08□□	I60M5×13	WD-208	--	WT20IT
XMR01□□-WP09□□				

Applicable tool D9-D10 Tools code key B20-B21 Grade selection guide B15-B19 Technical data B164-B170

Selection of inserts



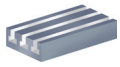
Good working condition Normal working condition Bad working condition



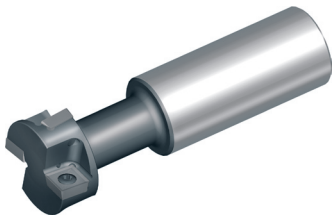
Insert shape	Type	Basic dimensions(mm)				CVD Coating					PVD Coating					Cermet		Cemented carbide			
		B	Re	S_1	D_1	YBC301	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	WPGT050315ZSR	11°	1.5	3.5	7.94			●													
	WPGT060415ZSR	11°	1.5	4.2	9.525			●													
	WPGT080615ZSR	11°	1.5	6.35	12.85			●													
	WPGT090725ZSR	11°	2.5	7	15			●													

★Recommended grade and always stock available ☆Recommended grade and produce according to order
●Available grade and always stock available ○Available grade and produce according to order

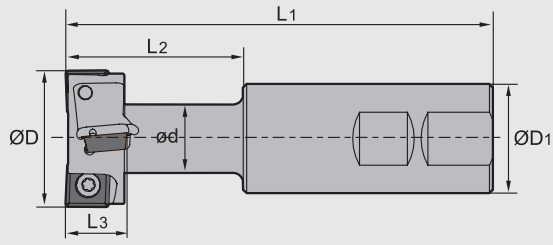
T-slot milling tools Kr:90°



TMP01 K



Weldon shank

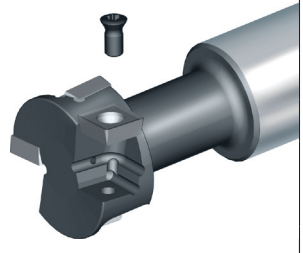


Specification of tools

Type		Stock	Basic dimensions(mm)						Number of teeth Z	Number of insert	T-slot specification
			ØD	ØD1	ød	L1	L2	L3			
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

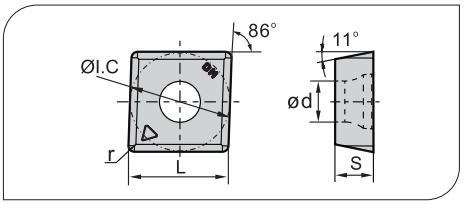
▲Stock available △Produce according to order

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			

Applicable tool D11-D13 Tools code key B20-B21 Grade selection guide B15-B19 Technical data B164-B170

Selection of inserts



Good working condition Normal working condition Bad working condition

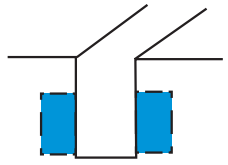
Workpiece material

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			
		I.C	L	s	d	r	YBC301	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**MPHT060304-DM**	6.35	6.35	3.18	2.8	0.4								★								
	MPHT080305-DM	8.3	8.3	3.18	3.4	0.5								★								
	MPHT120408-DM	12.7	12.7	4.76	5.56	0.8								★								

★Recommended grade and always stock available ☆Recommended grade and produce according to order
●Available grade and always stock available ○Available grade and produce according to order

◆Workpiece before machining

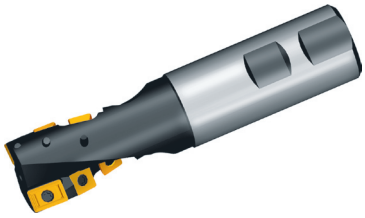


Recommended cutting parameters

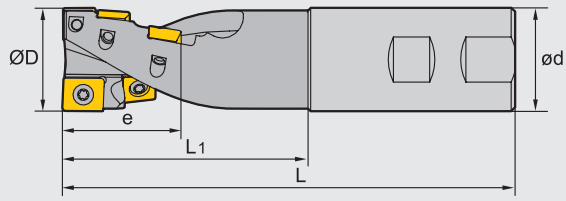
Workpiece material	Insert grade	Cutting parameters		
		V(m/min)	f(mm/z)	Cooling
Grey cast iron	YBG302	80~160	0.05~0.2	Wet / Dry

Helical end mill Kr:90°

HMP01 P K



Weldon shank



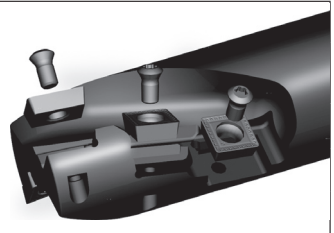
Specification of tools

Type		Stock		Basic dimensions(mm)					Number of flute	Number of insert		Shank type
		R	L	ØD	ød	e	L_1	L	Z	APKT 150412-□□	SPMT 120408-□□	
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 △Produce according to order

Spare parts

Diameter ØD	Screw	Wrench
		
Ø40	I60M5×10	WT20IS
Ø50	I60M5×13	WT20IS

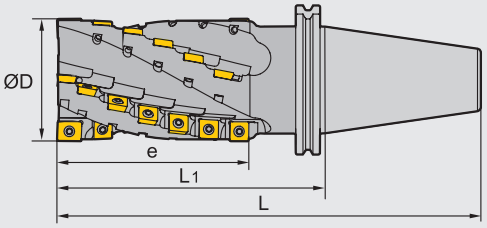


Applicable tool D11-D13 Tools code key B20-B21 Grade selection guide B15-B19 Technical data B164-B170

Helical end mill Kr:90°

HMP01 P K

JT shank/BT shank(Example is JT shank)



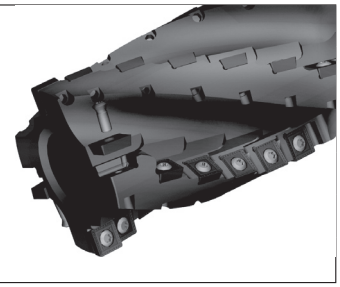
Specification of tools

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

▲Stock available △Produce according to order

Spare parts

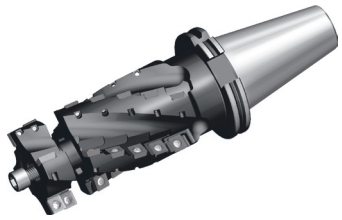
Diameter ØD	Screw	Wrench
		
Ø50	I60M5×13	WT20IS
Ø63	I60M5×13	WT20IS
Ø80	I60M5×13	WT20IS

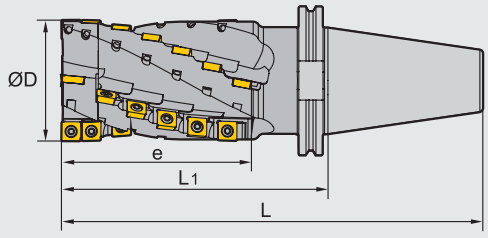


Tools code key B20-B21 Grade selection guide B15-B19 Technical data B164-B170

Helical endmills with interchangeable heads Kr:90°

HMP01 EC P K





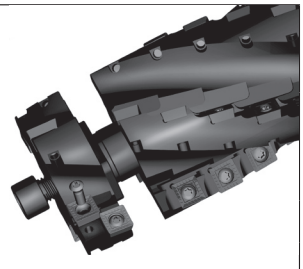
Specification of tools

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

▲Stock available △Produce according to order

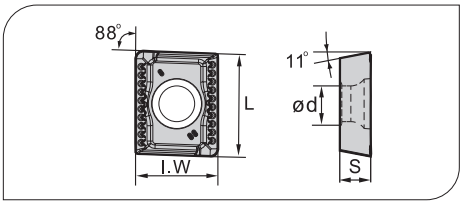
Spare parts

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

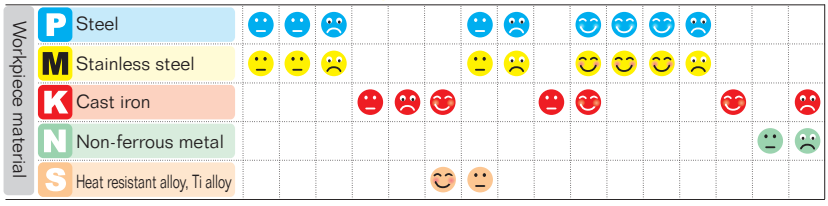


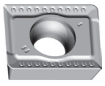
Tools code key B20-B21 Grade selection guide B15-B19 Technical data B164-B170

Selection of inserts



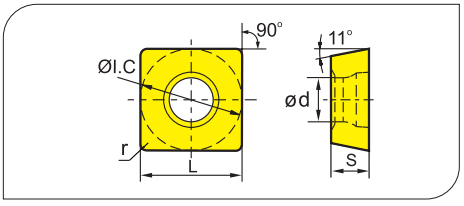
Good working condition Normal working condition Bad working condition



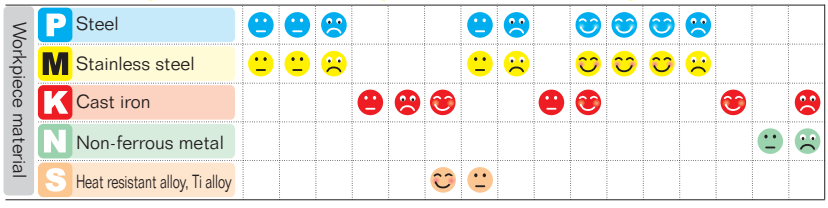
Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating					Cermet		Cemented carbide			
		L	I.W	S	d	r	YBC301	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**APKT150412-PM**	16.33	12.7	4.76	5.4	1.2								★	☆						
	APKT150412-KM	16.33	12.7	4.76	5.4	1.2								★	☆						

★Recommended grade and always stock available ☆Recommended grade and produce according to order
●Available grade and always stock available ○Available grade and produce according to order

Selection of inserts



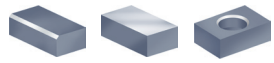
Good working condition Normal working condition Bad working condition



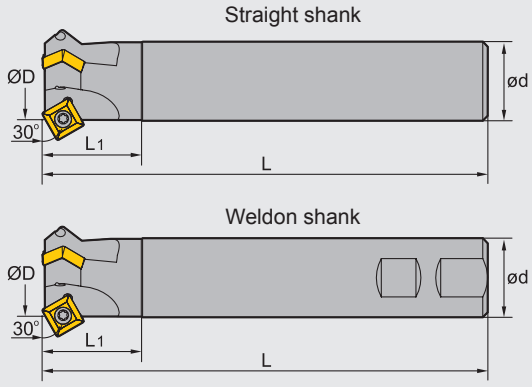
Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating					Cermet		Cemented carbide			
		L	I.C	S	d	r	YBC301	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**SPMT120408-PM**	12.7	12.7	4.76	5.5	0.8								★	☆						
	SPMT120408-KM	12.7	12.7	4.76	5.5	0.8								★	☆						

★Recommended grade and always stock available ☆Recommended grade and produce according to order
●Available grade and always stock available ○Available grade and produce according to order

Chamfer milling tools Kr:30°



CMZ01 P M K



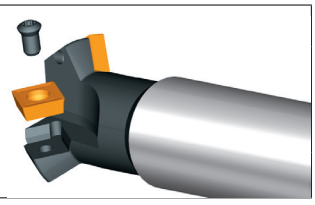
Specification of tools

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	180	40	1	0.2
	-025-G25-SP12-02	△	25	25	180	40	2	0.8
	-032-G32-SP12-03	△	32	32	180	40	3	1.1
Weldon shank	**-012-XP20-SP12-01**	△	12	20	100	40	1	0.2
	-025-XP25-SP12-02	△	25	25	100	40	2	0.6
	-032-XP32-SP12-03	△	32	32	100	40	3	1.0

▲Stock available △Produce according to order

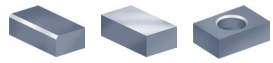
Spare parts

Diameter ØD	Screw	Wrench
		
Ø12-Ø32	I43M5×11	WT20IS

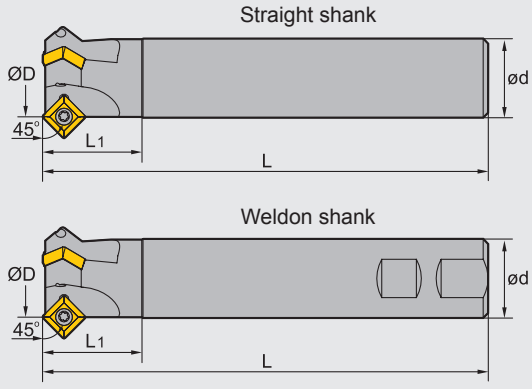


Applicable tool D9-10/D11-13 Tools code key B20-B21 Grade selection guide B15-B19 Technical data B164-B170

Chamfer milling tools Kr:45°



CMA01 P M K



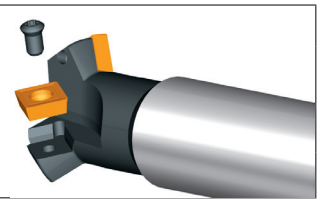
Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth Z	Weight (kg)
			ØD	ød	L	L1		
CMA01 Straight shank	**-012-G20-SP12-01**	▲	12	20	180	40	1	0.2
	-025-G25-SP12-02	▲	25	25	180	40	2	0.8
	-032-G32-SP12-03	▲	32	32	180	40	3	1.1
Weldon shank	**-012-XP20-SP12-01**	▲	12	20	100	40	1	0.2
	-025-XP25-SP12-02	▲	25	25	100	40	2	0.6
	-032-XP32-SP12-03	▲	32	32	100	40	3	1.0

▲Stock available △Produce according to order

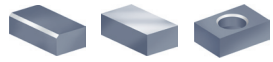
Spare parts

Diameter ØD	Screw	Wrench
		
Ø12-Ø32	I43M5×11	WT20IS



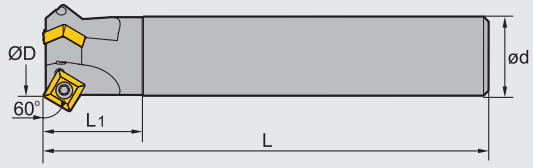
Applicable tool D9-10/D11-13
Tools code key B20-B21
Grade selection guide B15-B19
Technical data B164-B170

Chamfer milling tools Kr:60°

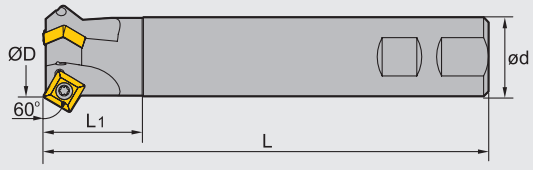


CMD01 P M K

Straight shank



Weldon shank



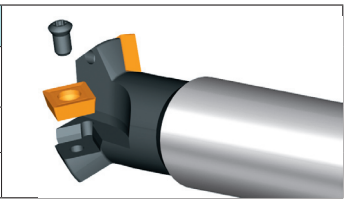
Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth Z	Weight (kg)
			ØD	ød	L	L1		
CMD01 Straight shank	**-012-G20-SP12-01**	▲	12	20	180	40	1	0.2
	-025-G25-SP12-02	▲	25	25	180	40	2	0.8
	-036-G32-SP12-03	▲	36	32	180	40	3	1.0
Weldon shank	**-012-XP20-SP12-01**	▲	12	20	100	40	1	0.2
	-025-XP25-SP12-02	▲	25	25	100	40	2	0.6
	-036-XP32-SP12-03	▲	36	32	100	40	3	1.0

▲Stock available △Produce according to order

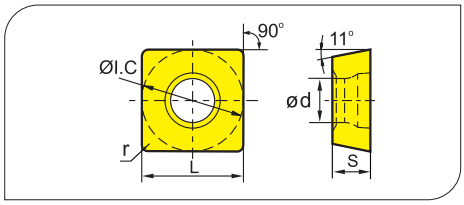
Spare parts

Diameter ØD	Screw	Wrench
		
Ø12-Ø32	I43M5×11	WT20IS

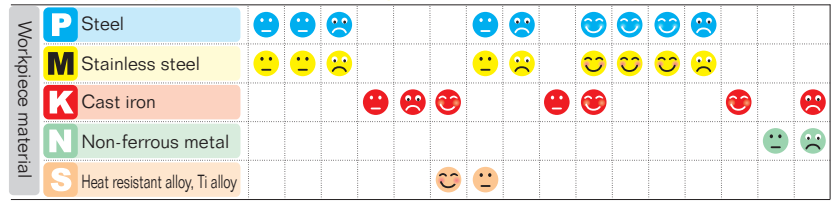


Applicable tool D9-10/D11-13 Tools code key B20-B21 Grade selection guide B15-B19 Technical data B164-B170

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.C	L	r	S	d	YBC301	YBM251	YBM351	YBD152	YBD252	YBG102	YBG202	YBG302	YBG152	YBG252	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**SPMT120408**	12.7	12.7	0.8	4.76	5.5	●	●	●					★					○			

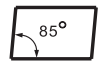
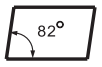
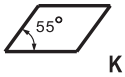
★Recommended grade and always stock available ☆Recommended grade and produce according to order
●Available grade and always stock available ○Available grade and produce according to order

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)

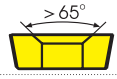
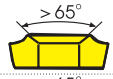
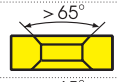
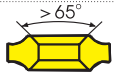
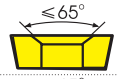
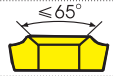
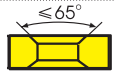
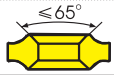
Indexable milling inserts code key

Insert Shape / Code

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

Insert shape

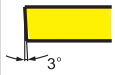
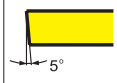
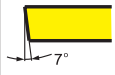
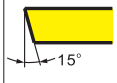
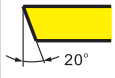
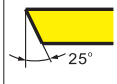
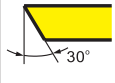
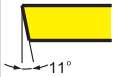
Metric

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		N	Without	Without	
H	With	Single-side		R	Without	Single-side	
C	With	Without		F	Without	Double-side	
J	With	Double-side		A	With	Without	
W	With	Without		M	With	Single-side	
T	With	Single-side		G	With	Double-side	
Q	With	Without		X	---	---	Special
U	With	Double-side					

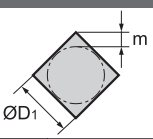
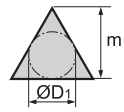
Chipbreaker and clamping system

S P K N

Clearance angle of main cutting edge

Code	Clearance angle	Code	Clearance angle
A		B	
C		D	
E		F	
G		N	
P		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)

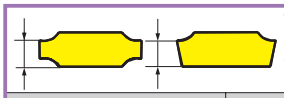
Inscribed circle	Regular triangle	Square	Diamond with 80°	Diamond with 55°	Diamond with 35°	Round
6.35	±0.08	±0.08	±0.08	±0.11	±0.16	---
9.525	±0.08	±0.08	±0.08	±0.11	±0.16	---
12.7	±0.13	±0.13	±0.13	±0.15	---	---
15.875	±0.15	±0.15	±0.15	±0.18	---	---
19.05	±0.15	±0.15	±0.15	±0.18	---	---
25.4	---	±0.18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

● 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 height from 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

Selection guide for solid carbide end mills

Shape of tool

Type of Tool

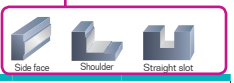
Series of tool

Solid Carbide End Mills
GM series

Size of shape

Machining operation

2-flute flattened end mills with straight shank



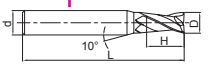


Figure 1

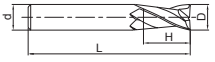


Figure 2

- Very suitable for slot milling
- Wide application.

Ordering number	Basic dimension(mm)				Number of teeth Z	Geometry
	D	d	H	L		
GM-2E-D1.0S	1.0	4	3	50	2	Figure 1
GM-2E-D1.5S	1.5	4	4	50	2	Figure 1
GM-2E-D2.0S	2.0	4	6	50	2	Figure 1
GM-2E-D2.5S	2.5	4	8	50	2	Figure 1
GM-2E-D3.0S	3.0	4	8	50	2	Figure 1
GM-2E-D4.0S	4.0	4	11	50	2	Figure 2
GM-2E-D1.0	1.0	6	3	50	2	Figure 1
GM-2E-D1.5	1.5	6	4	50	2	Figure 1
GM-2E-D2.0	2.0	6	6	50	2	Figure 1
GM-2E-D2.5	2.5	6	8	50	2	Figure 1
GM-2E-D3.0	3.0	6	8	50	2	Figure 1
GM-2E-D3.5	3.5	6	10	50	2	Figure 1
GM-2E-D4.0	4.0	6	11	50	2	Figure 1
GM-2E-D4.5	4.5	6	11	50	2	Figure 1
GM-2E-D5.0	5.0	6	13	50	2	Figure 1
GM-2E-D5.5	5.5	6	16	50	2	Figure 1
GM-2E-D6.0	6.0	6	16	50	2	Figure 2
GM-2E-D7.0	7.0	8	20	60	2	Figure 1
GM-2E-D8.0	8.0	8	20	60	2	Figure 2
GM-2E-D9.0	9.0	10	22	75	2	Figure 1
GM-2E-D10.0	10.0	10	25	75	2	Figure 2
GM-2E-D11.0	11.0	12	26	75	2	Figure 1
GM-2E-D12.0	12.0	12	30	75	2	Figure 2
GM-2E-D14.0	14.0	14	32	75	2	Figure 2
GM-2E-D16.0	16.0	16	45	100	2	Figure 2
GM-2E-D18.0	18.0	18	45	100	2	Figure 2
GM-2E-D20.0	20.0	20	45	100	2	Figure 2

Applicable material table

◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel、Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC	~68HRC						
◎	◎	◎	◎			○	◎			○	○

Code key B176 | Cutting parameters B239 | Graphics category and identification B177 | Non-standard tailor made B289-B290

Specification
Type, basic dimension, number of teeth and structure

Helical angle, coated and cutting diameter tolerance etc.

Workpiece material range

Product features

Code key, cutting parameters, graphics category and identification, non-standard tailor made

Solid Carbide End Mills

Solid carbide end mills overview

Machining operation	Geometry	Number of teeth	Type	Shape	Size range	Workpiece material								Page	
						P		M	K	N		S	H		
						Carbon steel, alloy steel	Pre-hardened steel	Stainless steel	Cast iron	Copper alloy	Aluminum alloy	Heat resistant alloy	High hardness steel	Specification	Cutting parameters
General machining	Flattened	2	GM-2E		Ø1.0~Ø20.0	◎	◎	○	◎			○		B179	B239
			GM-2EL		Ø3.0~Ø20.0	◎	◎	○	◎			○		B180	B239
		4	GM-4E		Ø1.0~Ø20.0	◎	◎	○	◎			○		B181	B240
			GM-4EL		Ø3.0~Ø20.0	◎	◎	○	◎			○		B182	B240
		6	GM-6E		Ø6.0~Ø20.0	◎	◎	○	◎			○		B183	B241
			GM-6EL		Ø6.0~Ø20.0	◎	◎	○	◎			○		B184	B242
	Long neck flattened	2	GM-2EP		Ø0.5~Ø5.0	◎	◎	○	◎			○		B185	B243
	Tiny head flattened	2	GM-2ES		Ø0.3~Ø3.0	◎	◎	○	◎			○		B187	B245
	Ball nose	2	GM-2B		R0.5~R10.0	◎	◎	○	◎			○		B188	B246
			GM-2BL		R1.0~R10.0	◎	◎	○	◎			○		B189	B246
		4	GM-4B		R1.5~R10.0	◎	◎	○	◎			○		B190	B247
	Tiny ball nose	2	GM-2BS		R0.15~R1.5	◎	◎	○	◎			○		B191	B248
	Long neck ball nose	2	GM-2BP		R0.25~R2.5	◎	◎	○	◎			○		B192	B249
	Radius	2	GM-2R		Ø1.0~Ø12.0	◎	◎	○	◎			○		B194	B251
		4	GM-4R		Ø3.0~Ø12.0	◎	◎	○	◎			○		B195	B252
			GM-4RL		Ø6.0~Ø16.0	◎	◎	○	◎			○		B196	B252
	Corrugated edge	4	GM-4W		Ø6.0~Ø20.0	◎	◎	○	◎			○		B197	B253
Machining high hardness steel	Flattened	2	HM-2E		Ø1.0~Ø20.0				○				◎	B200	B255
			HM-2EFP		Ø6.0~Ø20.0				○				◎	B201	B256
		4	HM-4E		Ø1.0~Ø20.0				○				◎	B202	B257
			HM-4EL		Ø3.0~Ø20.0				○				◎	B203	B257
			HM-4EFP		Ø6.0~Ø20.0				○				◎	B204	B258
		6	HM-6E		Ø6.0~Ø20.0				○				◎	B205	B259
			HM-6EL		Ø6.0~Ø20.0				○				◎	B206	B260
	Long neck flattened	2	HM-2EP		Ø0.5~Ø5.0				○				◎	B207	B261
	Tiny head flattened	2	HM-2ES		Ø0.3~Ø3.0				○				◎	B209	B263

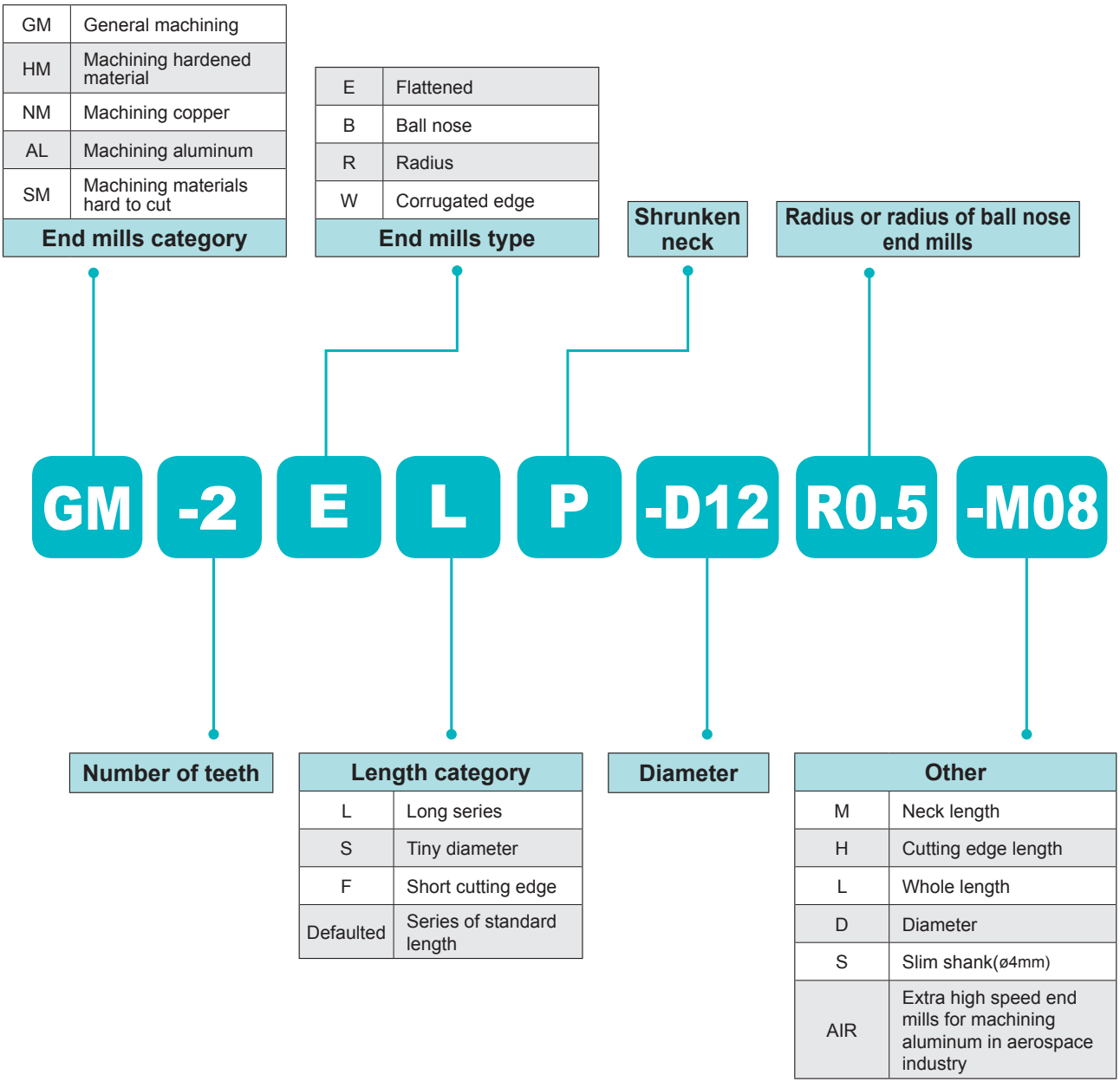
◎Very suitable ○Suitable

Machining operation	Geometry	Number of teeth	Type	Shape	Size range	Workpiece material								Page	
						P		M	K	N		S	H		
						Carbon steel, alloy steel	Pre-hardened steel	Stainless steel	Cast iron	Copper alloy	Aluminum alloy	Heat resistant alloy	High hardness steel	Specification	Cutting parameters
Machining high hardness steel	Ball nose	2	HM-2B		R0.5~R10.0				○				◎	B210	B264
			HM-2BL		R1.0~R10.0				○				◎	B211	B264
			HM-2BFP		R0.5~R10.0				○				◎	B212	B264
		4	HM-4B		R1.5~R10.0				○				◎	B213	B265
	Tiny ball nose	2	HM-2BS		R0.15~R1.5				○				◎	B214	B266
	Long neck ball nose	2	HM-2BP		R0.25~R2.5				○				◎	B215	B267
	Radius	4	HM-4R		Ø3.0~Ø12.0				○				◎	B217	B269
			HM-4RF		Ø6.0~Ø12.0				○				◎	B218	B269
			HM-4RP		Ø6.0~Ø16.0				○				◎	B219	B269
Machining copper	Flattened	2	NM-2E		Ø1.0~Ø12.0					◎	○			B221	B270
		4	NM-4E		Ø3.0~Ø12.0					◎	○			B222	B271
	Long neck flattened	2	NM-2EP		Ø0.5~Ø5.0					◎	○			B223	B272
	Ball nose	2	NM-2B		R0.5~R6.0					◎	○			B224	B273
	Long neck ball nose	2	NM-2BP		R0.25~R2.5					◎	○			B225	B274
Machining aluminum	Flattened	2	AL-2E		Ø1.0~Ø20.0						◎			B227	B275
			AL-2EL		Ø3.0~Ø20.0						◎			B228	B275
		3	AL-3E		Ø1.0~Ø20.0						◎			B229	B276
	Ball nose	2	AL-2B		R1.0~R6.0						◎			B230	B277
	Corrugated edge	3	AL-3W		Ø6.0~Ø20.0						◎			B231	B278
	Radius (extra high speed)	2	AL-2R-AIR		Ø6.0~Ø20.0						◎			B232	B279
			AL-2RL-AIR		Ø6.0~Ø20.0						◎			B233	B280
		3	AL-3R-AIR		Ø12.0~Ø20.0						◎			B234	B281
			AL-3RL-AIR		Ø12.0~Ø20.0						◎			B235	B282
Machining materials hard to cut	Flattened	3	SM-3E		Ø3.0~Ø20.0	◎		◎				◎		B237	B283
	Radius	4	SM-4R		Ø6.0~Ø12.0	◎		◎				◎		B238	B284

◎Very suitable ○Suitable

Solid Carbide End Mills

Solid carbide end mills code key



End mills category	
GM	General machining
HM	Machining hardened material
NM	Machining copper
AL	Machining aluminum
SM	Machining materials hard to cut

End mills type	
E	Flattened
B	Ball nose
R	Radius
W	Corrugated edge

Shrunken neck

Radius or radius of ball nose end mills

Number of teeth

Length category	
L	Long series
S	Tiny diameter
F	Short cutting edge
Defaulted	Series of standard length

Diameter

Other	
M	Neck length
H	Cutting edge length
L	Whole length
D	Diameter
S	Slim shank(ø4mm)
AIR	Extra high speed end mills for machining aluminum in aerospace industry

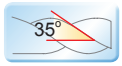
2-flute flattened end mills with straight shank


Side face


Step shoulder


Straight slot

- Very suitable for slot milling
- Wide application.



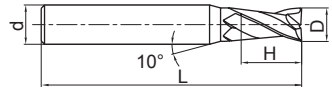


Figure 1

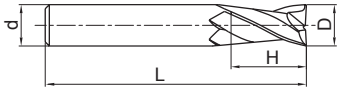


Figure 2

Ordering number	Basic dimension(mm)				Number of teeth Z	Geometry
	D	d	H	L		
GM-2E-D1.0S	1.0	4	3	50	2	Figure 1
GM-2E-D1.5S	1.5	4	4	50	2	Figure 1
GM-2E-D2.0S	2.0	4	6	50	2	Figure 1
GM-2E-D2.5S	2.5	4	8	50	2	Figure 1
GM-2E-D3.0S	3.0	4	8	50	2	Figure 1
GM-2E-D4.0S	4.0	4	11	50	2	Figure 2
GM-2E-D1.0	1.0	6	3	50	2	Figure 1
GM-2E-D1.5	1.5	6	4	50	2	Figure 1
GM-2E-D2.0	2.0	6	6	50	2	Figure 1
GM-2E-D2.5	2.5	6	8	50	2	Figure 1
GM-2E-D3.0	3.0	6	8	50	2	Figure 1
GM-2E-D3.5	3.5	6	10	50	2	Figure 1
GM-2E-D4.0	4.0	6	11	50	2	Figure 1
GM-2E-D4.5	4.5	6	11	50	2	Figure 1
GM-2E-D5.0	5.0	6	13	50	2	Figure 1
GM-2E-D5.5	5.5	6	16	50	2	Figure 1
GM-2E-D6.0	6.0	6	16	50	2	Figure 2
GM-2E-D7.0	7.0	8	20	60	2	Figure 1
GM-2E-D8.0	8.0	8	20	60	2	Figure 2
GM-2E-D9.0	9.0	10	22	75	2	Figure 1
GM-2E-D10.0	10.0	10	25	75	2	Figure 2
GM-2E-D11.0	11.0	12	26	75	2	Figure 1
GM-2E-D12.0	12.0	12	30	75	2	Figure 2
GM-2E-D14.0	14.0	14	32	75	2	Figure 2
GM-2E-D16.0	16.0	16	45	100	2	Figure 2
GM-2E-D18.0	18.0	18	45	100	2	Figure 2
GM-2E-D20.0	20.0	20	45	100	2	Figure 2

Applicable material table

◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel、Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC	~68HRC						
◎	◎	◎	◎			○	◎			○	○

Code key B176 Cutting parameters B239 Graphics category and identification B177 Non-standard tailor made B289-B290

2-flute flattened end mills with straight shank and long cutting edge


Side face


Step shoulder


Straight slot

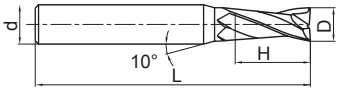


Figure 1

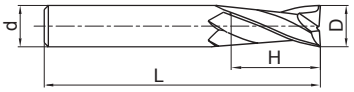
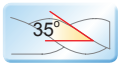


Figure 2

- GM-2E series with long cutting edge.



Ordering number	Basic dimension(mm)				Number of teeth Z	Geometry
	D	d	H	L		
GM-2EL-D3.0	3.0	6	12	75	2	Figure 1
GM-2EL-D4.0	4.0	6	15	75	2	Figure 1
GM-2EL-D5.0	5.0	6	20	75	2	Figure 1
GM-2EL-D6.0	6.0	6	20	75	2	Figure 2
GM-2EL-D8.0	8.0	8	25	100	2	Figure 2
GM-2EL-D10.0	10.0	10	30	100	2	Figure 2
GM-2EL-D12.0	12.0	12	35	100	2	Figure 2
GM-2EL-D14.0	14.0	14	40	100	2	Figure 2
GM-2EL-D16.0	16.0	16	50	150	2	Figure 2
GM-2EL-D20.0	20.0	20	55	150	2	Figure 2

Applicable material table

◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel、Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC	~68HRC						
◎	◎	◎	◎			○	◎			○	○

Code key B176
Cutting parameters B239
Graphics category and identification B177
Non-standard tailor made B289-B290

4-flute flattened end mills with straight shank


Side face


Step shoulder


Straight slot

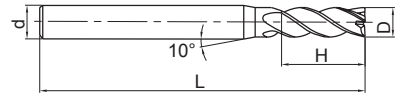


Figure 1

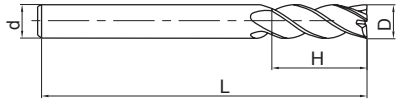
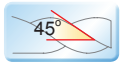


Figure 2

- For side milling and shallow slot machining.
- Wide application.



Ordering number	Basic dimension(mm)				Number of teeth Z	Geometry
	D	d	H	L		
GM-4E-D1.0S	1.0	4	3	50	4	Figure 1
GM-4E-D1.5S	1.5	4	4	50	4	Figure 1
GM-4E-D2.0S	2.0	4	6	50	4	Figure 1
GM-4E-D2.5S	2.5	4	8	50	4	Figure 1
GM-4E-D3.0S	3.0	4	8	50	4	Figure 1
GM-4E-D4.0S	4.0	4	11	50	4	Figure 2
GM-4E-D1.0	1.0	6	3	50	4	Figure 1
GM-4E-D1.5	1.5	6	4	50	4	Figure 1
GM-4E-D2.0	2.0	6	6	50	4	Figure 1
GM-4E-D2.5	2.5	6	8	50	4	Figure 1
GM-4E-D3.0	3.0	6	8	50	4	Figure 1
GM-4E-D3.5	3.5	6	10	50	4	Figure 1
GM-4E-D4.0	4.0	6	11	50	4	Figure 1
GM-4E-D4.5	4.5	6	11	50	4	Figure 1
GM-4E-D5.0	5.0	6	13	50	4	Figure 1
GM-4E-D5.5	5.5	6	16	50	4	Figure 1
GM-4E-D6.0	6.0	6	16	50	4	Figure 2
GM-4E-D7.0	7.0	8	20	60	4	Figure 1
GM-4E-D8.0	8.0	8	20	60	4	Figure 2
GM-4E-D9.0	9.0	10	22	75	4	Figure 1
GM-4E-D10.0	10.0	10	25	75	4	Figure 2
GM-4E-D11.0	11.0	12	26	75	4	Figure 1
GM-4E-D12.0	12.0	12	30	75	4	Figure 2
GM-4E-D14.0	14.0	14	32	75	4	Figure 2
GM-4E-D16.0	16.0	16	45	100	4	Figure 2
GM-4E-D18.0	18.0	18	45	100	4	Figure 2
GM-4E-D20.0	20.0	20	45	100	4	Figure 2

Applicable material table

◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel、Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC	~68HRC						
◎	◎	◎	◎			○	◎			○	○

Code key B176 Cutting parameters B240 Graphics category and identification B177 Non-standard tailor made B289-B290

4-flute flattened end mills with straight shank and long cutting edge


Side face


Step shoulder


Straight slot

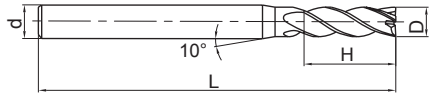


Figure 1

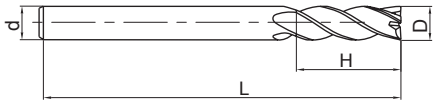
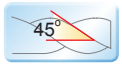


Figure 2

- GM-4E series with long cutting edge.



Ordering number	Basic dimension(mm)				Number of teeth Z	Geometry
	D	d	H	L		
GM-4EL-D3.0	3.0	6	12	75	4	Figure 1
GM-4EL-D4.0	4.0	6	15	75	4	Figure 1
GM-4EL-D5.0	5.0	6	20	75	4	Figure 1
GM-4EL-D6.0	6.0	6	20	75	4	Figure 2
GM-4EL-D8.0	8.0	8	25	100	4	Figure 2
GM-4EL-D10.0	10.0	10	30	100	4	Figure 2
GM-4EL-D12.0	12.0	12	35	100	4	Figure 2
GM-4EL-D14.0	14.0	14	40	100	4	Figure 2
GM-4EL-D16.0	16.0	16	50	150	4	Figure 2
GM-4EL-D20.0	20.0	20	55	150	4	Figure 2

Applicable material table

◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel、Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC	~68HRC						
◎	◎	◎	◎			○	◎			○	○

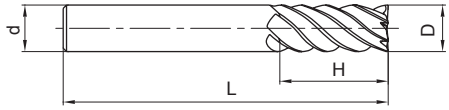
Code key B176
Cutting parameters B240
Graphics category and identification B177
Non-standard tailor made B289-B290

6-flute flattened end mills with straight shank

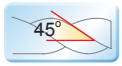

Side face


Step shoulder


Straight slot



- Perfect rigidity is particular for side finish machining.
- High speed, high feed rate.



Ordering number	Basic dimension(mm)				Number of teeth Z
	D	d	H	L	
GM-6E-D6.0	6.0	6	18	60	6
GM-6E-D8.0	8.0	8	20	60	6
GM-6E-D10.0	10.0	10	30	75	6
GM-6E-D12.0	12.0	12	32	75	6
GM-6E-D16.0	16.0	16	40	100	6
GM-6E-D20.0	20.0	20	45	100	6

Applicable material table

◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel、Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC	~68HRC						
◎	◎	◎	◎			○	◎			○	○

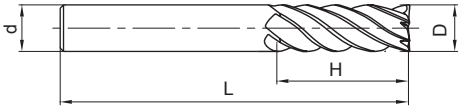
Code key B176 Cutting parameters B241 Graphics category and identification B177 Non-standard tailor made B289-B290

6-flute flattened end mills with straight shank and long cutting edge

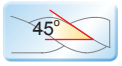

Side face


Step shoulder


Straight slot



- GM-6E series with long cutting edge.



Ordering number	Basic dimension(mm)				Number of teeth Z
	D	d	H	L	
GM-6EL-D6.0	6.0	6	24	75	6
GM-6EL-D8.0	8.0	8	32	75	6
GM-6EL-D10.0	10.0	10	40	100	6
GM-6EL-D12.0	12.0	12	45	100	6
GM-6EL-D16.0	16.0	16	64	150	6
GM-6EL-D20.0	20.0	20	75	150	6

Applicable material table

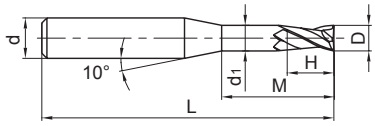
◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel、Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC	~68HRC						
◎	◎	◎	◎			○	◎			○	○

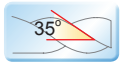
Code key B176
Cutting parameters B242
Graphics category and identification B177
Non-standard tailor made B289-B290

2-flute straight shank end mills with short cutting edge and long neck

Deep flattened slot



- Applicable for narrow slot machining.



Ordering number	Basic dimension(mm)						Number of teeth
	D	d	H	M	d1	L	Z
GM-2EP-D0.5-M04	0.5	4.0	0.7	4.0	0.45	50	2
GM-2EP-D0.5-M06	0.5	4.0	0.7	6.0	0.45	50	2
GM-2EP-D0.5-M08	0.5	4.0	0.7	8.0	0.45	50	2
GM-2EP-D0.8-M04	0.8	4.0	1.2	4.0	0.75	50	2
GM-2EP-D0.8-M06	0.8	4.0	1.2	6.0	0.75	50	2
GM-2EP-D0.8-M08	0.8	4.0	1.2	8.0	0.75	50	2
GM-2EP-D0.8-M10	0.8	4.0	1.2	10.0	0.75	50	2
GM-2EP-D1.0-M04	1.0	4.0	1.5	4.0	0.95	50	2
GM-2EP-D1.0-M06	1.0	4.0	1.5	6.0	0.95	50	2
GM-2EP-D1.0-M08	1.0	4.0	1.5	8.0	0.95	50	2
GM-2EP-D1.0-M10	1.0	4.0	1.5	10.0	0.95	50	2
GM-2EP-D1.0-M12	1.0	4.0	1.5	12.0	0.95	50	2
GM-2EP-D1.0-M14	1.0	4.0	1.5	14.0	0.95	50	2
GM-2EP-D1.2-M06	1.2	4.0	1.8	6.0	1.15	50	2
GM-2EP-D1.2-M08	1.2	4.0	1.8	8.0	1.15	50	2
GM-2EP-D1.2-M10	1.2	4.0	1.8	10.0	1.15	50	2
GM-2EP-D1.2-M12	1.2	4.0	1.8	12.0	1.15	50	2
GM-2EP-D1.5-M06	1.5	4.0	2.3	6.0	1.45	50	2
GM-2EP-D1.5-M08	1.5	4.0	2.3	8.0	1.45	50	2
GM-2EP-D1.5-M10	1.5	4.0	2.3	10.0	1.45	50	2
GM-2EP-D1.5-M12	1.5	4.0	2.3	12.0	1.45	50	2
GM-2EP-D1.5-M14	1.5	4.0	2.3	14.0	1.45	50	2
GM-2EP-D2.0-M06	2.0	4.0	3.0	6.0	1.95	50	2
GM-2EP-D2.0-M08	2.0	4.0	3.0	8.0	1.95	50	2

Applicable material table

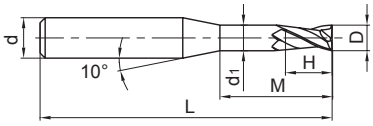
◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel、Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC	~68HRC						
◎	◎	◎	○			○	◎			○	○

Code key B176 Cutting parameters B243-B244 Graphics category and identification B177 Non-standard tailor made B289-B290

2-flute straight shank end mills with short cutting edge and long neck

Deep flattened slot



- Applicable for narrow slot machining.

35° | Coated TiAlN | D 0~-0.015 | D<1mm | 1mm≤D

Ordering number	Basic dimension(mm)						Number of teeth
	D	d	H	M	d_1	L	Z
GM-2EP-D2.0-M10	2.0	4.0	3.0	10.0	1.95	50	2
GM-2EP-D2.0-M12	2.0	4.0	3.0	12.0	1.95	50	2
GM-2EP-D2.0-M14	2.0	4.0	3.0	14.0	1.95	50	2
GM-2EP-D2.0-M16	2.0	4.0	3.0	16.0	1.95	50	2
GM-2EP-D2.5-M08	2.5	4.0	3.7	8.0	2.4	50	2
GM-2EP-D2.5-M10	2.5	4.0	3.7	10.0	2.4	50	2
GM-2EP-D2.5-M12	2.5	4.0	3.7	12.0	2.4	50	2
GM-2EP-D2.5-M14	2.5	4.0	3.7	14.0	2.4	50	2
GM-2EP-D2.5-M16	2.5	4.0	3.7	16.0	2.4	60	2
GM-2EP-D2.5-M18	2.5	4.0	3.7	18.0	2.4	60	2
GM-2EP-D2.5-M20	2.5	4.0	3.7	20.0	2.4	60	2
GM-2EP-D3.0-M06	3.0	6.0	4.5	6.0	2.85	50	2
GM-2EP-D3.0-M08	3.0	6.0	4.5	8.0	2.85	50	2
GM-2EP-D3.0-M10	3.0	6.0	4.5	10.0	2.85	50	2
GM-2EP-D3.0-M12	3.0	6.0	4.5	12.0	2.85	50	2
GM-2EP-D3.0-M14	3.0	6.0	4.5	14.0	2.85	60	2
GM-2EP-D3.0-M16	3.0	6.0	4.5	16.0	2.85	60	2
GM-2EP-D3.0-M18	3.0	6.0	4.5	18.0	2.85	60	2
GM-2EP-D3.0-M20	3.0	6.0	4.5	20.0	2.85	60	2
GM-2EP-D4.0-M12	4.0	6.0	6.0	12.0	3.85	50	2
GM-2EP-D4.0-M16	4.0	6.0	6.0	16.0	3.85	60	2
GM-2EP-D4.0-M20	4.0	6.0	6.0	20.0	3.85	60	2
GM-2EP-D4.0-M25	4.0	6.0	6.0	25.0	3.85	60	2
GM-2EP-D5.0-M16	5.0	6.0	7.5	16.0	4.85	60	2
GM-2EP-D5.0-M25	5.0	6.0	7.5	25.0	4.85	70	2

Applicable material table

◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel、Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC	~68HRC						
◎	◎	◎	○			○	◎			○	○

Code key B176 | Cutting parameters B243-B244 | Graphics category and identification B177 | Non-standard tailor made B289-B290

2-flute ball nose end mills with straight shank


Profile

Cavity

Ball nose slot

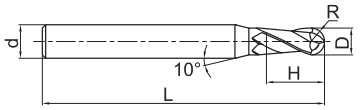


Figure 1

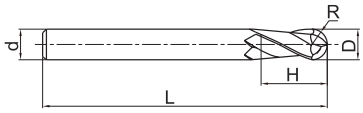
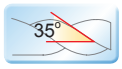
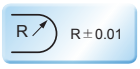


Figure 2

- Suitable for profile milling, for machining at high speed.
- Wide applications.





Ordering number	Basic dimension(mm)					Number of teeth Z	Geometry
	D	R	d	H	L		
GM-2B-R0.5S	1.0	0.5	4.0	2.0	50	2	Figure 1
GM-2B-R0.75S	1.5	0.75	4.0	3.0	50	2	Figure 1
GM-2B-R1.0S	2.0	1.0	4.0	4.0	50	2	Figure 1
GM-2B-R1.25S	2.5	1.25	4.0	5.0	50	2	Figure 1
GM-2B-R1.5S	3.0	1.5	4.0	6.0	50	2	Figure 1
GM-2B-R2.0S	4.0	2.0	4.0	8.0	50	2	Figure 2
GM-2B-R0.5	1.0	0.5	6.0	2.0	50	2	Figure 1
GM-2B-R0.75	1.5	0.75	6.0	3.0	50	2	Figure 1
GM-2B-R1.0	2.0	1.0	6.0	4.0	50	2	Figure 1
GM-2B-R1.25	2.5	1.25	6.0	5.0	50	2	Figure 1
GM-2B-R1.5	3.0	1.5	6.0	6.0	50	2	Figure 1
GM-2B-R1.75	3.5	1.75	6.0	8.0	50	2	Figure 1
GM-2B-R2.0	4.0	2.0	6.0	8.0	50	2	Figure 1
GM-2B-R2.5	5.0	2.5	6.0	10.0	50	2	Figure 1
GM-2B-R2.75	5.5	2.75	6.0	12.0	50	2	Figure 1
GM-2B-R3.0	6.0	3.0	6.0	12.0	50	2	Figure 2
GM-2B-R3.5	7.0	3.5	8.0	14.0	60	2	Figure 1
GM-2B-R4.0	8.0	4.0	8.0	16.0	60	2	Figure 2
GM-2B-R4.5	9.0	4.5	10.0	18.0	75	2	Figure 1
GM-2B-R5.0	10	5.0	10.0	20.0	75	2	Figure 2
GM-2B-R6.0	12	6.0	12.0	24.0	75	2	Figure 2
GM-2B-R7.0	14	7.0	14.0	28.0	75	2	Figure 2
GM-2B-R8.0	16	8.0	16.0	32.0	100	2	Figure 2
GM-2B-R10.0	20	10.0	20.0	40.0	100	2	Figure 2

Applicable material table

◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel、Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC	~68HRC						
◎	◎	◎	◎			○	◎			○	○

Code key B176 Cutting parameters B246 Graphics category and identification B177 Non-standard tailor made B289-B290

2-flute ball nose end mills with long straight shank


Profile


Cavity


Ball nose slot

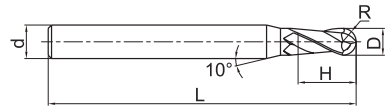


Figure 1

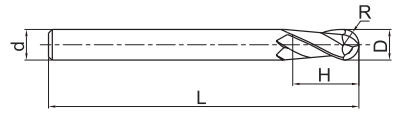


Figure 2

- GM-2B series with long shank.

35° | Coated TiAlN | D: D≤12 0~-0.020, 12<D 0~-0.030 | R: R±0.01

Ordering number	Basic dimension(mm)					Number of teeth Z	Geometry
	D	R	d	H	L		
GM-2BL-R1.0	2.0	1.0	6.0	4.0	75	2	Figure 1
GM-2BL-R1.25	2.5	1.25	6.0	5.0	75	2	Figure 1
GM-2BL-R1.5	3.0	1.5	6.0	6.0	75	2	Figure 1
GM-2BL-R1.75	3.5	1.75	6.0	8.0	75	2	Figure 1
GM-2BL-R2.0	4.0	2.0	6.0	8.0	75	2	Figure 1
GM-2BL-R2.5	5.0	2.5	6.0	10.0	75	2	Figure 1
GM-2BL-R2.75	5.5	2.75	6.0	12.0	75	2	Figure 1
GM-2BL-R3.0	6.0	3.0	6.0	12.0	75	2	Figure 2
GM-2BL-R3.5	7.0	3.5	8.0	14.0	75	2	Figure 1
GM-2BL-R4.0	8.0	4.0	8.0	16.0	100	2	Figure 2
GM-2BL-R4.5	9.0	4.5	10.0	18.0	100	2	Figure 1
GM-2BL-R5.0	10.0	5.0	10.0	20.0	100	2	Figure 2
GM-2BL-R6.0	12.0	6.0	12.0	24.0	100	2	Figure 2
GM-2BL-R7.0	14.0	7.0	14.0	28.0	100	2	Figure 2
GM-2BL-R8.0	16.0	8.0	16.0	32.0	150	2	Figure 2
GM-2BL-R10.0	20.0	10.0	20.0	40.0	150	2	Figure 2

Applicable material table

◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel、Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC	~68HRC						
◎	◎	◎	◎			○	◎			○	○

Code key B176 Cutting parameters B246 Graphics category and identification B177 Non-standard tailor made B289-B290

4-flute ball nose end mills with straight shank


Profile


Cavity


Ball nose slot

- 4-flute ball nose end mills can achieve high cutting efficiency at high feed speed.

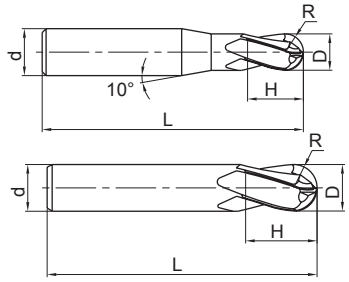
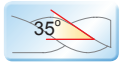
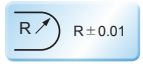


Figure 1

Figure 2





Ordering number	Basic dimension(mm)					Number of teeth Z	Geometry
	D	R	d	H	L		
GM-4B-R1.5	3.0	1.5	6.0	6.0	50	4	Figure 1
GM-4B-R2.0	4.0	2.0	6.0	8.0	50	4	Figure 1
GM-4B-R2.5	5.0	2.5	6.0	10.0	50	4	Figure 1
GM-4B-R3.0	6.0	3.0	6.0	12.0	50	4	Figure 2
GM-4B-R4.0	8.0	4.0	8.0	16.0	60	4	Figure 2
GM-4B-R5.0	10.0	5.0	10.0	20.0	75	4	Figure 2
GM-4B-R6.0	12.0	6.0	12.0	24.0	75	4	Figure 2
GM-4B-R7.0	14.0	7.0	14.0	28.0	75	4	Figure 2
GM-4B-R8.0	16.0	8.0	16.0	32.0	100	4	Figure 2
GM-4B-R9.0	18.0	9.0	18.0	36.0	100	4	Figure 2
GM-4B-R10.0	20.0	10.0	20.0	40.0	100	4	Figure 2

Applicable material table

◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel、Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC	~68HRC						
◎	◎	◎	◎			○	◎			○	○

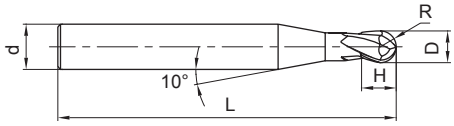
Code key B176
Cutting parameters B247
Graphics category and identification B177
Non-standard tailor made B289-B290

2-flute tiny ball nose end mills with straight shank

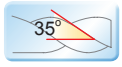

Profile

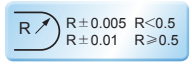

Cavity


Ball nose slot



- Tiny diameter end mills can fully display high speed and high precision functions of machining center, often used for machining precision components such as electronic part etc.





Ordering number	Basic dimension(mm)					Number of teeth Z
	D	R	d	H	L	
GM-2BS-R0.15	0.30	0.15	4.0	0.5	50	2
GM-2BS-R0.20	0.40	0.20	4.0	0.6	50	2
GM-2BS-R0.25	0.50	0.25	4.0	0.8	50	2
GM-2BS-R0.30	0.60	0.30	4.0	0.9	50	2
GM-2BS-R0.35	0.70	0.35	4.0	1.0	50	2
GM-2BS-R0.40	0.80	0.40	4.0	1.2	50	2
GM-2BS-R0.45	0.90	0.45	4.0	1.3	50	2
GM-2BS-R0.50	1.00	0.50	4.0	1.5	50	2
GM-2BS-R0.60	1.20	0.60	4.0	1.8	50	2
GM-2BS-R0.70	1.40	0.70	4.0	2.0	50	2
GM-2BS-R0.75	1.50	0.75	4.0	2.3	50	2
GM-2BS-R0.80	1.60	0.80	4.0	2.5	50	2
GM-2BS-R0.90	1.80	0.90	4.0	2.7	50	2
GM-2BS-R1.00	2.00	1.00	4.0	3.0	50	2
GM-2BS-R1.25	2.50	1.25	4.0	3.7	50	2
GM-2BS-R1.50	3.00	1.50	4.0	4.5	50	2

Applicable material table

◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel、Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC	~68HRC						
◎	◎	◎	○			○	◎			○	○

Code key B176 Cutting parameters B248 Graphics category and identification B177 Non-standard tailor made B289-B290

2-flute R end mills with straight shank


Radius shoulder


Profile


Radius corner slot

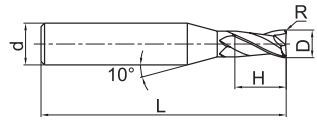


Figure 1

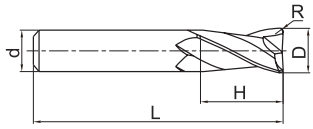
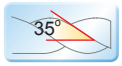
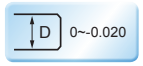


Figure 2

- Wide applications, applicable for several machining styles.





Ordering number	Basic dimension(mm)					Number of teeth Z	Geometry
	D	R	d	H	L		
GM-2R-D1.0R0.2	1.0	0.2	4	3	50	2	Figure 1
GM-2R-D1.5R0.2	1.5	0.2	4	4	50	2	Figure 1
GM-2R-D2.0R0.2	2.0	0.2	4	6	50	2	Figure 1
GM-2R-D2.0R0.5	2.0	0.5	4	6	50	2	Figure 1
GM-2R-D2.5R0.2	2.5	0.2	4	8	50	2	Figure 1
GM-2R-D2.5R0.5	2.5	0.5	4	8	50	2	Figure 1
GM-2R-D3.0R0.2	3.0	0.2	4	8	50	2	Figure 1
GM-2R-D3.0R0.3	3.0	0.3	4	8	50	2	Figure 1
GM-2R-D3.0R0.5	3.0	0.5	4	8	50	2	Figure 1
GM-2R-D4.0R0.2	4.0	0.2	4	11	50	2	Figure 2
GM-2R-D4.0R0.3	4.0	0.3	4	11	50	2	Figure 2
GM-2R-D4.0R0.5	4.0	0.5	4	11	50	2	Figure 2
GM-2R-D4.0R1.0	4.0	1.0	4	11	50	2	Figure 2
GM-2R-D5.0R0.3	5.0	0.3	6	13	50	2	Figure 1
GM-2R-D5.0R0.5	5.0	0.5	6	13	50	2	Figure 1
GM-2R-D5.0R1.0	5.0	1.0	6	13	50	2	Figure 1
GM-2R-D6.0R0.3	6.0	0.3	6	16	50	2	Figure 2
GM-2R-D6.0R0.5	6.0	0.5	6	16	50	2	Figure 2
GM-2R-D6.0R1.0	6.0	1.0	6	16	50	2	Figure 2
GM-2R-D8.0R0.3	8.0	0.3	8	20	60	2	Figure 2
GM-2R-D8.0R0.5	8.0	0.5	8	20	60	2	Figure 2
GM-2R-D8.0R1.0	8.0	1.0	8	20	60	2	Figure 2
GM-2R-D10.0R0.5	10.0	0.5	10	25	75	2	Figure 2
GM-2R-D10.0R1.0	10.0	1.0	10	25	75	2	Figure 2
GM-2R-D10.0R1.5	10.0	1.5	10	25	75	2	Figure 2
GM-2R-D10.0R2.0	10.0	2.0	10	25	75	2	Figure 2
GM-2R-D12.0R0.5	12.0	0.5	12	30	75	2	Figure 2
GM-2R-D12.0R1.0	12.0	1.0	12	30	75	2	Figure 2
GM-2R-D12.0R1.5	12.0	1.5	12	30	75	2	Figure 2
GM-2R-D12.0R2.0	12.0	2.0	12	30	75	2	Figure 2

Applicable material table

◎Very suitable ○Suitable

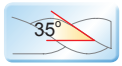
Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel、Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC	~68HRC						
◎	◎	◎	◎			○	◎			○	○

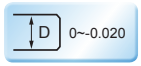
Code key B176
Cutting parameters B251
Graphics category and identification B177
Non-standard tailor made B289-B290

4-flute R end mills with straight shank

Radius shoulder | Profile | Radius corner slot

- Wide applications, applicable for several machining styles.





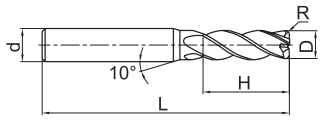


Figure 1

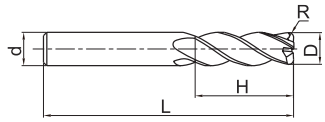


Figure 2

Ordering number	Basic dimension(mm)					Number of teeth Z	Geometry
	D	R	d	H	L		
GM-4R-D3.0R0.2	3.0	0.2	4	8	50	4	Figure 1
GM-4R-D4.0R0.3	4.0	0.3	4	10	50	4	Figure 2
GM-4R-D4.0R0.5	4.0	0.5	4	10	50	4	Figure 2
GM-4R-D5.0R0.5	5.0	0.5	6	13	50	4	Figure 1
GM-4R-D5.0R1.0	5.0	1.0	6	13	50	4	Figure 1
GM-4R-D6.0R0.5	6.0	0.5	6	16	50	4	Figure 2
GM-4R-D6.0R1.0	6.0	1.0	6	16	50	4	Figure 2
GM-4R-D8.0R0.5	8.0	0.5	8	20	60	4	Figure 2
GM-4R-D8.0R1.0	8.0	1.0	8	20	60	4	Figure 2
GM-4R-D10.0R0.5	10.0	0.5	10	25	75	4	Figure 2
GM-4R-D10.0R1.0	10.0	1.0	10	25	75	4	Figure 2
GM-4R-D10.0R2.0	10.0	2.0	10	25	75	4	Figure 2
GM-4R-D10.0R3.0	10.0	3.0	10	25	75	4	Figure 2
GM-4R-D12.0R0.5	12.0	0.5	12	30	75	4	Figure 2
GM-4R-D12.0R1.0	12.0	1.0	12	30	75	4	Figure 2
GM-4R-D12.0R2.0	12.0	2.0	12	30	75	4	Figure 2
GM-4R-D12.0R3.0	12.0	3.0	12	30	75	4	Figure 2

Applicable material table

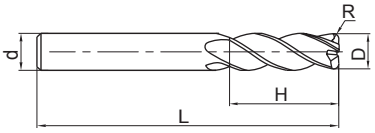
◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel、Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC	~68HRC						
◎	◎	◎	◎			○	◎			○	○

Code key B176 | Cutting parameters B252 | Graphics category and identification B177 | Non-standard tailor made B289-B290

4-flute R end mills with straight shank

Radius shoulder | Profile | Radius corner slot



- GM-4R series with long shank.

35° | Coated TiAlN | D 0~-0.020

Ordering number	Basic dimension(mm)					Number of teeth Z
	D	R	d	H	L	
GM-4RL-D6.0R0.5	6.0	0.5	6	16	75	4
GM-4RL-D6.0R1.0	6.0	1.0	6	16	75	4
GM-4RL-D8.0R0.5	8.0	0.5	8	20	100	4
GM-4RL-D8.0R1.0	8.0	1.0	8	20	100	4
GM-4RL-D10.0R0.5	10.0	0.5	10	25	100	4
GM-4RL-D10.0R1.0	10.0	1.0	10	25	100	4
GM-4RL-D10.0R2.0	10.0	2.0	10	25	100	4
GM-4RL-D12.0R0.5	12.0	0.5	12	30	100	4
GM-4RL-D12.0R1.0	12.0	1.0	12	30	100	4
GM-4RL-D12.0R2.0	12.0	2.0	12	30	100	4
GM-4RL-D16.0R1.0	16.0	1.0	16	45	150	4
GM-4RL-D16.0R2.0	16.0	2.0	16	45	150	4

Applicable material table

◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel、Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC	~68HRC						
◎	◎	◎	◎			○	◎			○	○

Code key B176 | Cutting parameters B252 | Graphics category and identification B177 | Non-standard tailor made B289-B290

4-flute flattened end mills with straight shank and corrugated edges (roughing)


Side face


Step shoulder


Straight slot

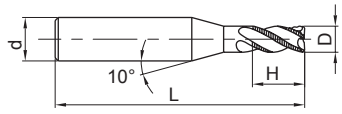


Figure 1

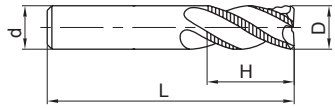
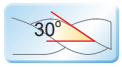
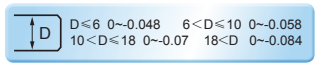


Figure 2

- Most suitable for effectively rough machining.





Ordering number	Basic dimension(mm)				Number of teeth Z	Geometry
	D	d	H	L		
GM-4W-D6.0	6	6	16	50	4	Figure 2
GM-4W-D7.0	7	8	20	60	4	Figure 1
GM-4W-D8.0	8	8	20	60	4	Figure 2
GM-4W-D9.0	9	10	22	75	4	Figure 1
GM-4W-D10.0	10	10	25	75	4	Figure 2
GM-4W-D11.0	11	12	26	75	4	Figure 1
GM-4W-D12.0	12	12	30	75	4	Figure 2
GM-4W-D16.0	16	16	45	100	4	Figure 2
GM-4W-D20.0	20	20	45	100	4	Figure 2

Applicable material table

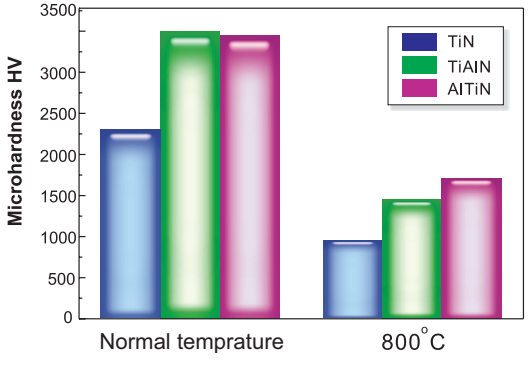
◎Very suitable ○Suitable

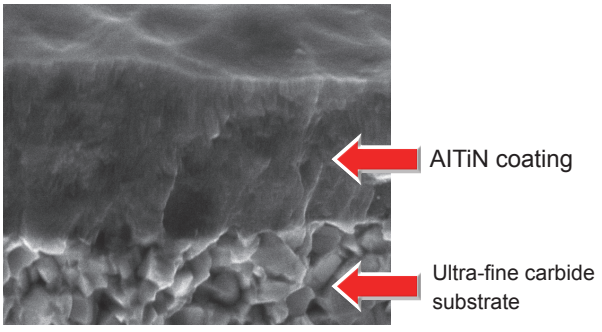
Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel、Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC	~68HRC						
◎	◎	◎				○	◎			○	○

Code key B176 Cutting parameters B253-B254 Graphics category and identification B177 Non-standard tailor made B289-B290

HM series end mills for machining high hardness steel

1. Big enough chip pocket and thick core designed, take rigidity and chip removal both into consideration.
2. Strict and reasonable flute control makes cutting and chip removal more stable
3. Appropriate rake angle design takes edge strength and sharpness both into consideration, tool application becomes wider.
4. Outstanding performances come from super ultra-fine grain carbide substrate, tool wear resistance and cutting edge strength combine perfectly.
5. Optimized AlTiN coating is particular for high hardness materials and high speed machining, possessing more prominent high-temp. hardness (red hardness) and high-temp stability.





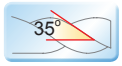
2-flute flattened end mills with straight shank


Side face


Step shoulder


Straight slot

- For slot milling.
- Most suitable for high speed cutting and dry cutting.



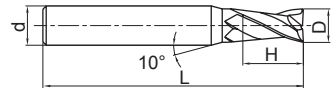


Figure 1

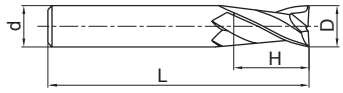


Figure 2

Ordering number	Basic dimension(mm)				Number of teeth Z	Geometry
	D	d	H	L		
HM-2E-D1.0S	1.0	4	3	50	2	Figure 1
HM-2E-D1.5S	1.5	4	4	50	2	Figure 1
HM-2E-D2.0S	2.0	4	6	50	2	Figure 1
HM-2E-D2.5S	2.5	4	8	50	2	Figure 1
HM-2E-D3.0S	3.0	4	8	50	2	Figure 1
HM-2E-D4.0S	4.0	4	11	50	2	Figure 2
HM-2E-D1.0	1.0	6	3	50	2	Figure 1
HM-2E-D1.5	1.5	6	4	50	2	Figure 1
HM-2E-D2.0	2.0	6	6	50	2	Figure 1
HM-2E-D2.5	2.5	6	8	50	2	Figure 1
HM-2E-D3.0	3.0	6	8	50	2	Figure 1
HM-2E-D3.5	3.5	6	10	50	2	Figure 1
HM-2E-D4.0	4.0	6	11	50	2	Figure 1
HM-2E-D4.5	4.5	6	11	50	2	Figure 1
HM-2E-D5.0	5.0	6	13	50	2	Figure 1
HM-2E-D5.5	5.5	6	16	50	2	Figure 1
HM-2E-D6.0	6.0	6	16	50	2	Figure 2
HM-2E-D7.0	7.0	8	20	60	2	Figure 1
HM-2E-D8.0	8.0	8	20	60	2	Figure 2
HM-2E-D9.0	9.0	10	22	75	2	Figure 1
HM-2E-D10.0	10.0	10	25	75	2	Figure 2
HM-2E-D11.0	11.0	12	26	75	2	Figure 1
HM-2E-D12.0	12.0	12	30	75	2	Figure 2
HM-2E-D14.0	14.0	14	32	100	2	Figure 2
HM-2E-D16.0	16.0	16	45	100	2	Figure 2
HM-2E-D18.0	18.0	18	45	100	2	Figure 2
HM-2E-D20.0	20.0	20	45	100	2	Figure 2

Applicable material table

◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel、Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC	~68HRC						
			○	◎	◎		○				

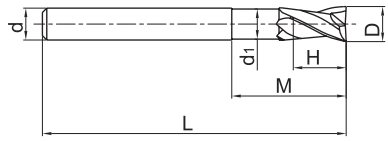
Code key B176 Cutting parameters B255 Graphics category and identification B177 Non-standard tailor made B289-B290

2-flute short cutting edge flattened end mills with long straight shank

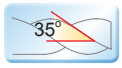

Side face


Step shoulder


Straight slot



- Short cutting edge and high rigidity designed, applicable for heavy cutting and deep cavity milling.



Ordering number	Basic dimension(mm)						Number of teeth
	D	d	H	M	d_1	L	Z
HM-2EFP-D6.0	6.0	6.0	9	30	5.8	75	2
HM-2EFP-D8.0	8.0	8.0	12	40	7.8	100	2
HM-2EFP-D10.0	10.0	10.0	15	50	9.6	100	2
HM-2EFP-D12.0	12.0	12.0	18	50	11.5	100	2
HM-2EFP-D16.0	16.0	16.0	24	50	15.5	150	2
HM-2EFP-D20.0	20.0	20.0	30	60	19.5	150	2

Applicable material table

◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel、Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	High temperature alloy
		~40HRC	~50HRC	~60HRC	~68HRC						
			○	◎	◎		○				

Code key B176 Cutting parameters B256 Graphics category and identification B177 Non-standard tailor made B289-B290

4-flute flattened end mills with straight shank


Side face


Step shoulder


Straight slot

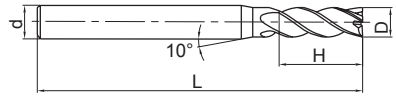


Figure 1

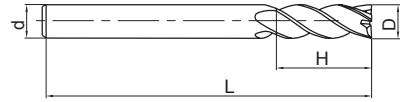
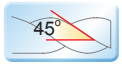


Figure 2

- For side milling and shallow slot milling
- Most suitable for high speed cutting and dry cutting.



Ordering number	Basic dimension(mm)				Number of teeth Z	Geometry
	D	d	H	L		
HM-4E-D1.0S	1.0	4	3	50	4	Figure 1
HM-4E-D1.5S	1.5	4	4	50	4	Figure 1
HM-4E-D2.0S	2.0	4	6	50	4	Figure 1
HM-4E-D2.5S	2.5	4	8	50	4	Figure 1
HM-4E-D3.0S	3.0	4	8	50	4	Figure 1
HM-4E-D4.0S	4.0	4	11	50	4	Figure 2
HM-4E-D1.0	1.0	6	3	50	4	Figure 1
HM-4E-D1.5	1.5	6	4	50	4	Figure 1
HM-4E-D2.0	2.0	6	6	50	4	Figure 1
HM-4E-D2.5	2.5	6	8	50	4	Figure 1
HM-4E-D3.0	3.0	6	8	50	4	Figure 1
HM-4E-D3.5	3.5	6	10	50	4	Figure 1
HM-4E-D4.0	4.0	6	11	50	4	Figure 1
HM-4E-D4.5	4.5	6	11	50	4	Figure 1
HM-4E-D5.0	5.0	6	13	50	4	Figure 1
HM-4E-D5.5	5.5	6	16	50	4	Figure 1
HM-4E-D6.0	6.0	6	16	50	4	Figure 2
HM-4E-D7.0	7.0	8	20	60	4	Figure 1
HM-4E-D8.0	8.0	8	20	60	4	Figure 2
HM-4E-D9.0	9.0	10	22	75	4	Figure 1
HM-4E-D10.0	10.0	10	25	75	4	Figure 2
HM-4E-D11.0	11.0	12	26	75	4	Figure 1
HM-4E-D12.0	12.0	12	30	75	4	Figure 2
HM-4E-D14.0	14.0	14	32	75	4	Figure 2
HM-4E-D16.0	16.0	16	45	100	4	Figure 2
HM-4E-D18.0	18.0	18	45	100	4	Figure 2
HM-4E-D20.0	20.0	20	45	100	4	Figure 2

Applicable material table

◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel、Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC	~68HRC						
			○	◎	◎		○				

Code key B176 Cutting parameters B257 Graphics category and identification B177 Non-standard tailor made B289-B290

4-flute long cutting edge flattened end mills with straight shank


Side face


Step shoulder


Straight slot

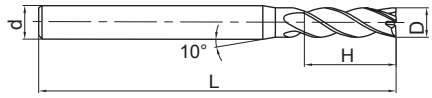


Figure 1

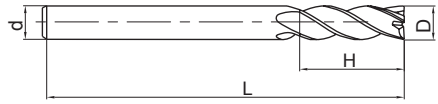
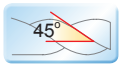


Figure 2

- HM-4E series with long cutting edge.



Ordering number	Basic dimension(mm)				Number of teeth Z	Geometry
	D	d	H	L		
HM-4EL-D3.0	3.0	6	12	75	4	Figure 1
HM-4EL-D4.0	4.0	6	15	75	4	Figure 1
HM-4EL-D5.0	5.0	6	20	75	4	Figure 1
HM-4EL-D6.0	6.0	6	20	75	4	Figure 2
HM-4EL-D8.0	8.0	8	25	100	4	Figure 2
HM-4EL-D10.0	10.0	10	30	100	4	Figure 2
HM-4EL-D12.0	12.0	12	35	100	4	Figure 2
HM-4EL-D14.0	14.0	14	40	100	4	Figure 2
HM-4EL-D16.0	16.0	16	50	150	4	Figure 2
HM-4EL-D20.0	20.0	20	55	150	4	Figure 2

Applicable material table

◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel、Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC	~68HRC						
			○	◎	◎		○				

Code key B176 Cutting parameters B257 Graphics category and identification B177 Non-standard tailor made B289-B290

Solid Carbide End Mills

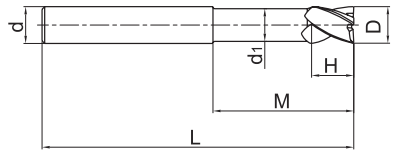
HM series for machining high hardness steel

4-flute short cutting edge flattened end mills with long straight shank

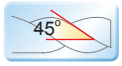

Side face


Step shoulder


Straight slot



- Short cutting edge and high rigidity designed, applicable for heavy cutting and deep cavity milling.



Ordering number	Basic dimension(mm)						Number of teeth Z
	D	d	H	M	d_1	L	
HM-4EFP-D6.0	6.0	6.0	9	30	5.8	75	4
HM-4EFP-D8.0	8.0	8.0	12	40	7.8	100	4
HM-4EFP-D10.0	10.0	10.0	15	50	9.6	100	4
HM-4EFP-D12.0	12.0	12.0	18	50	11.5	100	4
HM-4EFP-D16.0	16.0	16.0	24	50	15.5	150	4
HM-4EFP-D20.0	20.0	20.0	30	60	19.5	150	4

Applicable material table

◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel、Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	High temperature alloy
		~40HRC	~50HRC	~60HRC	~68HRC						
			○	◎	◎		○				

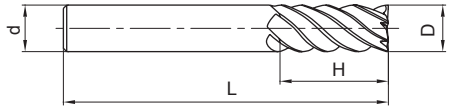
Code key B176 Cutting parameters B258 Graphics category and identification B177 Non-standard tailor made B289-B290

6-flute flattened end mills with straight shank

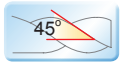

Side face


Step shoulder


Straight slot



- Perfect tool rigidity can most reduce relieving amount in side milling.
- Most suitable for high speed cutting and dry cutting.



Ordering number	Basic dimension(mm)				Number of teeth Z
	D	d	H	L	
HM-6E-D6.0	6.0	6	18	60	6
HM-6E-D8.0	8.0	8	20	60	6
HM-6E-D10.0	10.0	10	30	75	6
HM-6E-D12.0	12.0	12	32	75	6
HM-6E-D16.0	16.0	16	40	100	6
HM-6E-D20.0	20.0	20	45	100	6

Applicable material table

◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel、Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC	~68HRC						
			○	◎	◎		○				

Code key B176 Cutting parameters B259 Graphics category and identification B177 Non-standard tailor made B289-B290

Solid Carbide End Mills

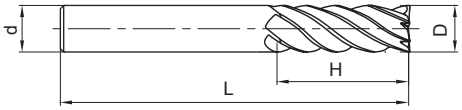
HM series for machining high hardness steel

6-flute long cutting edge flattened end mills with straight shank

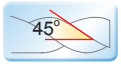

Side face


Step shoulder


Straight slot



- HM-6E series with long cutting edge.



Ordering number	Basic dimension(mm)				Number of teeth Z
	D	d	H	L	
HM-6EL-D6.0	6.0	6	24	75	6
HM-6EL-D8.0	8.0	8	32	75	6
HM-6EL-D10.0	10.0	10	40	100	6
HM-6EL-D12.0	12.0	12	45	100	6
HM-6EL-D16.0	16.0	16	64	150	6
HM-6EL-D20.0	20.0	20	75	150	6

Applicable material table

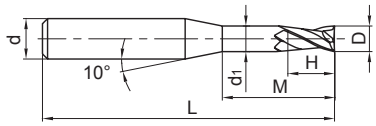
◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel、Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC	~68HRC						
			○	◎	◎		○				

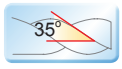
Code key B176 Cutting parameters B260 Graphics category and identification B177 Non-standard tailor made B289-B290

2-flute short cutting edge flattened end mills with straight shank and long neck


Deep flattened slot



- Applicable for narrow slot machining.



D<1mm

1mm≤D


Ordering number	Basic dimension(mm)						Number of teeth
	D	d	H	M	d_1	L	Z
HM-2EP-D0.5-M04	0.5	4.0	0.7	4.0	0.45	50	2
HM-2EP-D0.5-M06	0.5	4.0	0.7	6.0	0.45	50	2
HM-2EP-D0.5-M08	0.5	4.0	0.7	8.0	0.45	50	2
HM-2EP-D0.8-M04	0.8	4.0	1.2	4.0	0.75	50	2
HM-2EP-D0.8-M06	0.8	4.0	1.2	6.0	0.75	50	2
HM-2EP-D0.8-M08	0.8	4.0	1.2	8.0	0.75	50	2
HM-2EP-D0.8-M10	0.8	4.0	1.2	10.0	0.75	50	2
HM-2EP-D1.0-M04	1.0	4.0	1.5	4.0	0.95	50	2
HM-2EP-D1.0-M06	1.0	4.0	1.5	6.0	0.95	50	2
HM-2EP-D1.0-M08	1.0	4.0	1.5	8.0	0.95	50	2
HM-2EP-D1.0-M10	1.0	4.0	1.5	10.0	0.95	50	2
HM-2EP-D1.0-M12	1.0	4.0	1.5	12.0	0.95	50	2
HM-2EP-D1.0-M14	1.0	4.0	1.5	14.0	0.95	50	2
HM-2EP-D1.2-M06	1.2	4.0	1.8	6.0	1.15	50	2
HM-2EP-D1.2-M08	1.2	4.0	1.8	8.0	1.15	50	2
HM-2EP-D1.2-M10	1.2	4.0	1.8	10.0	1.15	50	2
HM-2EP-D1.2-M12	1.2	4.0	1.8	12.0	1.15	50	2
HM-2EP-D1.5-M06	1.5	4.0	2.3	6.0	1.45	50	2
HM-2EP-D1.5-M08	1.5	4.0	2.3	8.0	1.45	50	2
HM-2EP-D1.5-M10	1.5	4.0	2.3	10.0	1.45	50	2
HM-2EP-D1.5-M12	1.5	4.0	2.3	12.0	1.45	50	2
HM-2EP-D1.5-M14	1.5	4.0	2.3	14.0	1.45	50	2
HM-2EP-D2.0-M06	2.0	4.0	3.0	6.0	1.95	50	2
HM-2EP-D2.0-M08	2.0	4.0	3.0	8.0	1.95	50	2
HM-2EP-D2.0-M10	2.0	4.0	3.0	10.0	1.95	50	2
HM-2EP-D2.0-M12	2.0	4.0	3.0	12.0	1.95	50	2
HM-2EP-D2.0-M14	2.0	4.0	3.0	14.0	1.95	50	2
HM-2EP-D2.0-M16	2.0	4.0	3.0	16.0	1.95	50	2

Applicable material table

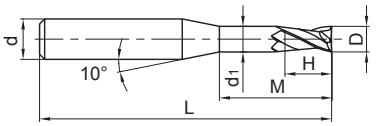
◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel、Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC	~68HRC						
			◎	◎			○				

Code key B176 Cutting parameters B261-B262 Graphics category and identification B177 Non-standard tailor made B289-B290

2-flute short cutting edge flattened end mills with straight shank and long neck

Deep flattened slot



- Applicable for narrow slot machining.

35° | Coated AlTiN | D 0~-0.015 | D<1mm | 1mm≤D

Ordering number	Basic dimension(mm)						Number of teeth
	D	d	H	M	d_1	L	Z
HM-2EP-D2.5-M08	2.5	4.0	3.7	8.0	2.4	50	2
HM-2EP-D2.5-M10	2.5	4.0	3.7	10.0	2.4	50	2
HM-2EP-D2.5-M12	2.5	4.0	3.7	12.0	2.4	50	2
HM-2EP-D2.5-M14	2.5	4.0	3.7	14.0	2.4	50	2
HM-2EP-D2.5-M16	2.5	4.0	3.7	16.0	2.4	60	2
HM-2EP-D2.5-M18	2.5	4.0	3.7	18.0	2.4	60	2
HM-2EP-D2.5-M20	2.5	4.0	3.7	20.0	2.4	60	2
HM-2EP-D3.0-M06	3.0	6.0	4.5	6.0	2.85	50	2
HM-2EP-D3.0-M08	3.0	6.0	4.5	8.0	2.85	50	2
HM-2EP-D3.0-M10	3.0	6.0	4.5	10.0	2.85	50	2
HM-2EP-D3.0-M12	3.0	6.0	4.5	12.0	2.85	50	2
HM-2EP-D3.0-M14	3.0	6.0	4.5	14.0	2.85	60	2
HM-2EP-D3.0-M16	3.0	6.0	4.5	16.0	2.85	60	2
HM-2EP-D3.0-M18	3.0	6.0	4.5	18.0	2.85	60	2
HM-2EP-D3.0-M20	3.0	6.0	4.5	20.0	2.85	60	2
HM-2EP-D4.0-M12	4.0	6.0	6.0	12.0	3.85	60	2
HM-2EP-D4.0-M16	4.0	6.0	6.0	16.0	3.85	60	2
HM-2EP-D4.0-M20	4.0	6.0	6.0	20.0	3.85	60	2
HM-2EP-D4.0-M25	4.0	6.0	6.0	25.0	3.85	60	2
HM-2EP-D5.0-M16	5.0	6.0	7.5	16.0	4.85	60	2
HM-2EP-D5.0-M25	5.0	6.0	7.5	25.0	4.85	70	2

Applicable material table

◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel、Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC	~68HRC						
			◎	◎			○				

Code key B176 | Cutting parameters B261-B262 | Graphics category and identification B177 | Non-standard tailor made B289-B290

2-flute ball nose end mills with straight shank


Profile


Cavity


Ball nose slot

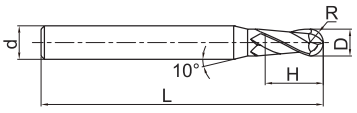


Figure 1

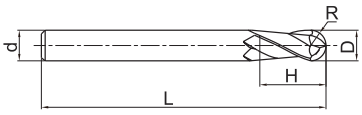
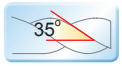
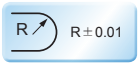


Figure 2

- For profile milling.
- Most suitable for high speed cutting and dry cutting.





Ordering number	Basic dimension(mm)					Number of teeth Z	Geometry
	D	R	d	H	L		
HM-2B-R0.5S	1.0	0.5	4.0	2.0	50	2	Figure 1
HM-2B-R0.75S	1.5	0.75	4.0	3.0	50	2	Figure 1
HM-2B-R1.0S	2.0	1.0	4.0	4.0	50	2	Figure 1
HM-2B-R1.25S	2.5	1.25	4.0	5.0	50	2	Figure 1
HM-2B-R1.5S	3.0	1.5	4.0	6.0	50	2	Figure 1
HM-2B-R2.0S	4.0	2.0	4.0	8.0	50	2	Figure 2
HM-2B-R0.5	1.0	0.5	6.0	2.0	50	2	Figure 1
HM-2B-R0.75	1.5	0.75	6.0	3.0	50	2	Figure 1
HM-2B-R1.0	2.0	1.0	6.0	4.0	50	2	Figure 1
HM-2B-R1.25	2.5	1.25	6.0	5.0	50	2	Figure 1
HM-2B-R1.5	3.0	1.5	6.0	6.0	50	2	Figure 1
HM-2B-R1.75	3.5	1.75	6.0	8.0	50	2	Figure 1
HM-2B-R2.0	4.0	2.0	6.0	8.0	50	2	Figure 1
HM-2B-R2.5	5.0	2.5	6.0	10.0	50	2	Figure 1
HM-2B-R2.75	5.5	2.75	6.0	12.0	50	2	Figure 1
HM-2B-R3.0	6.0	3.0	6.0	12.0	50	2	Figure 2
HM-2B-R3.5	7.0	3.5	8.0	14.0	60	2	Figure 1
HM-2B-R4.0	8.0	4.0	8.0	16.0	60	2	Figure 2
HM-2B-R4.5	9.0	4.5	10.0	18.0	75	2	Figure 1
HM-2B-R5.0	10.0	5.0	10.0	20.0	75	2	Figure 2
HM-2B-R6.0	12.0	6.0	12.0	24.0	75	2	Figure 2
HM-2B-R7.0	14.0	7.0	14.0	28.0	75	2	Figure 2
HM-2B-R8.0	16.0	8.0	16.0	32.0	100	2	Figure 2
HM-2B-R10.0	20.0	10.0	20.0	40.0	100	2	Figure 2

Applicable material table

◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel、Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC	~68HRC						
			○	◎	◎		○				

Code key B176 Cutting parameters B264 Graphics category and identification B177 Non-standard tailor made B289-B290

2-flute ball nose end mills with long straight shank


Profile


Cavity


Ball nose slot

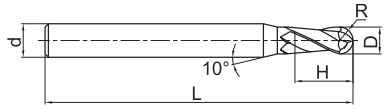


Figure 1

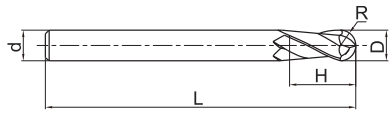


Figure 2

- HM-2B series with long shank.

35° | Coated AlTiN | D: D≤12 0~-0.020, 12<D 0~-0.030 | R: R±0.01

Ordering number	Basic dimension(mm)					Number of teeth Z	Geometry
	D	R	d	H	L		
HM-2BL-R1.0	2.0	1.0	6.0	4.0	75	2	Figure 1
HM-2BL-R1.25	2.5	1.25	6.0	6.0	75	2	Figure 1
HM-2BL-R1.5	3.0	1.5	6.0	6.0	75	2	Figure 1
HM-2BL-R1.75	3.5	1.75	6.0	8.0	75	2	Figure 1
HM-2BL-R2.0	4.0	2.0	6.0	8.0	75	2	Figure 1
HM-2BL-R2.5	5.0	2.5	6.0	10.0	75	2	Figure 1
HM-2BL-R2.75	5.5	2.75	6.0	12.0	75	2	Figure 1
HM-2BL-R3.0	6.0	3.0	6.0	12.0	75	2	Figure 2
HM-2BL-R3.5	7.0	3.5	8.0	14.0	75	2	Figure 1
HM-2BL-R4.0	8.0	4.0	8.0	16.0	100	2	Figure 2
HM-2BL-R4.5	9.0	4.5	10.0	18.0	100	2	Figure 1
HM-2BL-R5.0	10.0	5.0	10.0	20.0	100	2	Figure 2
HM-2BL-R6.0	12.0	6.0	12.0	24.0	100	2	Figure 2
HM-2BL-R7.0	14.0	7.0	14.0	28.0	100	2	Figure 2
HM-2BL-R8.0	16.0	8.0	16.0	32.0	150	2	Figure 2
HM-2BL-R10.0	20.0	10.0	20.0	40.0	150	2	Figure 2

Applicable material table

◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel、Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC	~68HRC						
			○	◎	◎		○				

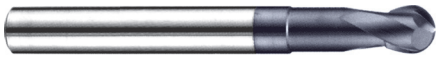
Code key B176 Cutting parameters B264 Graphics category and identification B177 Non-standard tailor made B289-B290

2-flute short cutting edge ball nose end mills with long straight shank


Profile


Cavity


Ball nose slot



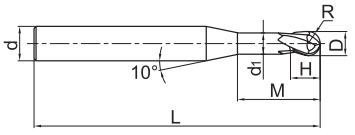


Figure 1

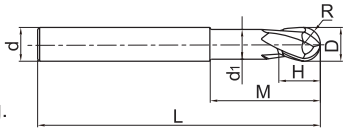
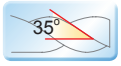
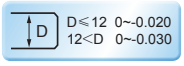
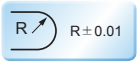


Figure 2

- Short cutting edge and high rigidity designed, applicable for heavy cutting.







Ordering number	Basic dimension(mm)							Number of teeth Z	Geometry
	D	R	H	d_1	M	d	L		
HM-2BFP-R0.5	1.0	0.5	1.0	0.95	2.5	6	75	2	Figure 1
HM-2BFP-R0.75	1.5	0.75	1.5	1.45	3.0	6	75	2	Figure 1
HM-2BFP-R1.0	2.0	1.0	2.0	1.95	4.0	6	75	2	Figure 1
HM-2BFP-R1.5	3.0	1.5	3.0	2.85	6.0	6	75	2	Figure 1
HM-2BFP-R2.0	4.0	2.0	4.0	3.85	8.0	6	75	2	Figure 1
HM-2BFP-R2.5	5.0	2.5	5.0	4.85	10.0	6	75	2	Figure 1
HM-2BFP-R3.0	6.0	3.0	6.0	5.8	12.0	6	75	2	Figure 2
HM-2BFP-R4.0	8.0	4.0	8.0	7.8	16.0	8	100	2	Figure 2
HM-2BFP-R5.0	10.0	5.0	10	9.6	20.0	10	100	2	Figure 2
HM-2BFP-R6.0	12.0	6.0	12	11.5	24.0	12	100	2	Figure 2
HM-2BFP-R8.0	16.0	8.0	16	15.5	32.0	16	150	2	Figure 2
HM-2BFP-R10.0	20.0	10.0	20	19.5	40.0	20	150	2	Figure 2

Applicable material table

◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel、Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC	~68HRC						
			○	◎	◎		○				

Code key B176 Cutting parameters B264 Graphics category and identification B177 Non-standard tailor made B289-B290

4-flute ball nose end mills with straight shank

Profile | Cavity | Ball nose slot

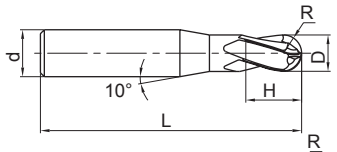


Figure 1

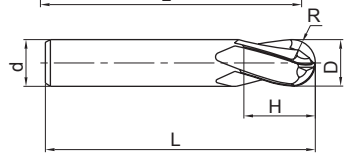
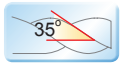


Figure 2

- 4-flute ball nose end mill can carry out higher feed speed and improve machining efficiency, extend too life in machining high hardness workpiece.



Ordering number	Basic dimension(mm)					Number of teeth Z	Geometry
	D	R	d	H	L		
HM-4B-R1.5	3.0	1.5	6.0	6.0	50	4	Figure 1
HM-4B-R2.0	4.0	2.0	6.0	8.0	50	4	Figure 1
HM-4B-R2.5	5.0	2.5	6.0	10.0	50	4	Figure 1
HM-4B-R3.0	6.0	3.0	6.0	12.0	50	4	Figure 2
HM-4B-R4.0	8.0	4.0	8.0	16.0	60	4	Figure 2
HM-4B-R5.0	10.0	5.0	10.0	20.0	75	4	Figure 2
HM-4B-R6.0	12.0	6.0	12.0	24.0	75	4	Figure 2
HM-4B-R7.0	14.0	7.0	14.0	28.0	75	4	Figure 2
HM-4B-R8.0	16.0	8.0	16.0	32.0	100	4	Figure 2
HM-4B-R9.0	18.0	9.0	18.0	36.0	100	4	Figure 2
HM-4B-R10.0	20.0	10.0	20.0	40.0	100	4	Figure 2

Applicable material table

◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel、Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC	~68HRC						
			○	◎	◎		○				

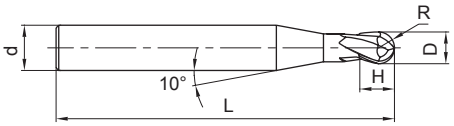
Code key B176 | Cutting parameters B265 | Graphics category and identification B177 | Non-standard tailor made B289-B290

2-flute tiny diameter ball nose end mills with straight shank

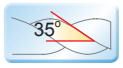

Profile

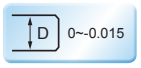

Cavity


Ball nose slot



- Tiny diameter end mills can fully display high speed and high precision functions of machining center, often used for machining precision components such as electronic part etc.





Ordering number	Basic dimension(mm)					Number of teeth Z
	D	R	d	H	L	
HM-2BS-R0.15	0.30	0.15	4.0	0.5	50	2
HM-2BS-R0.20	0.40	0.20	4.0	0.6	50	2
HM-2BS-R0.25	0.50	0.25	4.0	0.8	50	2
HM-2BS-R0.30	0.60	0.30	4.0	0.9	50	2
HM-2BS-R0.35	0.70	0.35	4.0	1.0	50	2
HM-2BS-R0.40	0.80	0.40	4.0	1.2	50	2
HM-2BS-R0.45	0.90	0.45	4.0	1.3	50	2
HM-2BS-R0.50	1.00	0.50	4.0	1.5	50	2
HM-2BS-R0.60	1.20	0.60	4.0	1.8	50	2
HM-2BS-R0.70	1.40	0.70	4.0	2.0	50	2
HM-2BS-R0.75	1.50	0.75	4.0	2.3	50	2
HM-2BS-R0.80	1.60	0.80	4.0	2.5	50	2
HM-2BS-R0.90	1.80	0.90	4.0	2.7	50	2
HM-2BS-R1.00	2.00	1.00	4.0	3.0	50	2
HM-2BS-R1.25	2.50	1.25	4.0	3.7	50	2
HM-2BS-R1.50	3.00	1.50	4.0	4.5	50	2

Applicable material table

◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel、Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC	~68HRC						
			◎	◎			○				

Code key B176 Cutting parameters B266 Graphics category and identification B177 Non-standard tailor made B289-B290

4-flute R end mills with straight shank


Radius shoulder


Profile


Radius corner slot

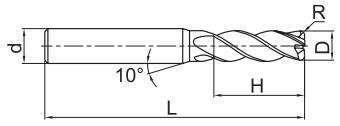


Figure 1

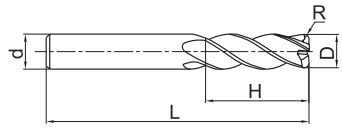
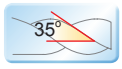


Figure 2

- Wide applications, applicable for several machining styles.



Ordering number	Basic dimension(mm)					Number of teeth Z	Geometry
	D	R	d	H	L		
HM-4R-D3.0R0.2	3.0	0.2	4	8	50	4	Figure 1
HM-4R-D4.0R0.3	4.0	0.3	4	10	50	4	Figure 2
HM-4R-D4.0R0.5	4.0	0.5	4	10	50	4	Figure 2
HM-4R-D5.0R0.5	5.0	0.5	6	13	50	4	Figure 1
HM-4R-D5.0R1.0	5.0	1.0	6	13	50	4	Figure 1
HM-4R-D6.0R0.5	6.0	0.5	6	16	50	4	Figure 2
HM-4R-D6.0R1.0	6.0	1.0	6	16	50	4	Figure 2
HM-4R-D8.0R0.5	8.0	0.5	8	20	60	4	Figure 2
HM-4R-D8.0R1.0	8.0	1.0	8	20	60	4	Figure 2
HM-4R-D10.0R0.5	10.0	0.5	10	25	75	4	Figure 2
HM-4R-D10.0R1.0	10.0	1.0	10	25	75	4	Figure 2
HM-4R-D10.0R2.0	10.0	2.0	10	25	75	4	Figure 2
HM-4R-D10.0R3.0	10.0	3.0	10	25	75	4	Figure 2
HM-4R-D12.0R0.5	12.0	0.5	12	30	75	4	Figure 2
HM-4R-D12.0R1.0	12.0	1.0	12	30	75	4	Figure 2
HM-4R-D12.0R2.0	12.0	2.0	12	30	75	4	Figure 2
HM-4R-D12.0R3.0	12.0	3.0	12	30	75	4	Figure 2

Applicable material table

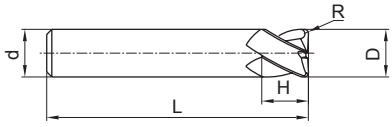
◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel、Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC	~68HRC						
			○	◎	◎		○				

Code key B176 Cutting parameters B269 Graphics category and identification B177 Non-standard tailor made B289-B290

4-flute short cutting edge R end mills with straight shank

Radius shoulder | Profile | Radius corner slot



- Short edge design with high rigidity, for cutting with high feed rate at high speed.

35° | Coated AlTiN | D 0~-0.020

Ordering number	Basic dimension(mm)					Number of teeth Z
	D	R	d	H	L	
HM-4RF-D6.0R0.5	6.0	0.5	6.0	6	50	4
HM-4RF-D6.0R1.0	6.0	1.0	6.0	6	50	4
HM-4RF-D8.0R0.5	8.0	0.5	8.0	8	60	4
HM-4RF-D8.0R1.0	8.0	1.0	8.0	8	60	4
HM-4RF-10.0R0.5	10.0	0.5	10.0	10	75	4
HM-4RF-D10.0R1.0	10.0	1.0	10.0	10	75	4
HM-4RF-D10.0R2.0	10.0	2.0	10.0	10	75	4
HM-4RF-D12.0R0.5	12.0	0.5	12.0	12	75	4
HM-4RF-D12.0R1.0	12.0	1.0	12.0	12	75	4
HM-4RF-D12.0R2.0	12.0	2.0	12.0	12	75	4

Applicable material table

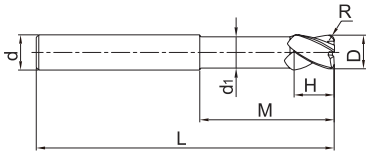
◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel、Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC	~68HRC						
			○	◎	◎		○				

Code key B176 | Cutting parameters B269 | Graphics category and identification B177 | Non-standard tailor made B289-B290

4-flute short cutting edge R end mills with straight shank and long neck

Radius shoulder | Profile | Radius corner slot



- Long shank and short cutting edge designed for deep cavity milling.

35° | Coated AlTiN | D: D≤12 0~-0.020, 12<D 0~-0.030

Ordering number	Basic dimension(mm)							Number of teeth
	D	R	d	d_1	H	M	L	Z
HM-4RP-D6.0R0.5	6.0	0.5	6.0	5.8	6.0	18	75	4
HM-4RP-D6.0R1.0	6.0	1.0	6.0	5.8	6.0	18	75	4
HM-4RP-D8.0R0.5	8.0	0.5	8.0	7.8	8.0	24	100	4
HM-4RP-D8.0R1.0	8.0	1.0	8.0	7.8	8.0	24	100	4
HM-4RP-10.0R0.5	10.0	0.5	10.0	9.6	10.0	30	100	4
HM-4RP-10.0R1.0	10.0	1.0	10.0	9.6	10.0	30	100	4
HM-4RP-10.0R2.0	10.0	2.0	10.0	9.6	10.0	30	100	4
HM-4RP-12.0R0.5	12.0	0.5	12.0	11.5	12.0	36	100	4
HM-4RP-12.0R1.0	12.0	1.0	12.0	11.5	12.0	36	100	4
HM-4RP-12.0R2.0	12.0	2.0	12.0	11.5	12.0	36	100	4
HM-4RP-D16.0R1.0	16.0	1.0	16.0	15.5	16.0	40	150	4
HM-4RP-D16.0R2.0	16.0	2.0	16.0	15.5	16.0	40	150	4

Applicable material table

◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel、Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC	~68HRC						
			○	◎	◎		○				

Code key B176 | Cutting parameters B269 | Graphics category and identification B177 | Non-standard tailor made B289-B290

NM series end mills for machining copper

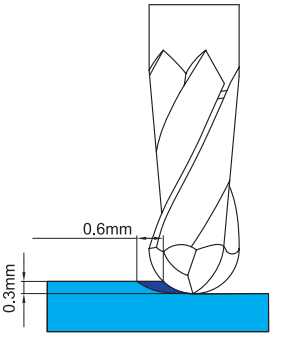
Extremely outstanding NM series end mills, greatly improve the machining performance in copper or copper alloy.

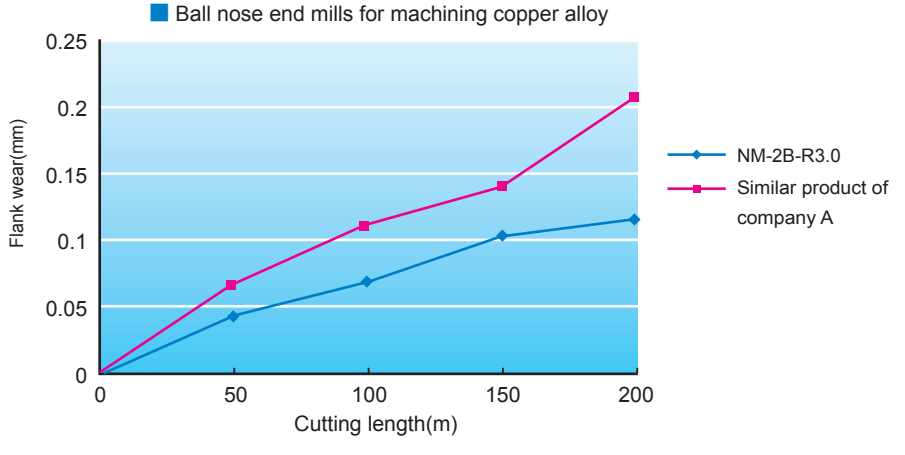
- Transcendent sharpness is very suitable for high precision machining copper or copper alloy.
- CrN coating with perfect lubricating property and minimal friction factor, achieves light and fast cutting process, extra long tool life and high surface quality.

Coating	Micro hardness（hv）	Friction factor	Initial temperature of oxidation(℃)	Bonding strength with substrate
CrN	1800	0.25	700	◎
TiN	2200	0.4	500	◎
TiCN	2700	0.3	400	○
TiAlN	2800	0.3	800	◎

◎excellent ○common

- Tool type：NM-2B-R3.0
- Size：R3.0mm
- Workpiece material：C1100
- Rotating speed：8000r/min (150m/min)
- Feed speed：1200mm/r (0.15mm/r)
- Axial cutting depth：Ap=0.3mm
- Radial cutting depth：Ae=0.6mm
- Cutting style: face milling (down milling)
- Cooling system: air blow
- Machine：MIKRON UCP 1000





2-flute flattened end mills with straight shank


Side face


Step shoulder


Straight slot

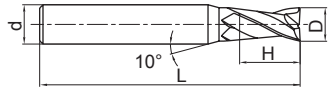


Figure 1

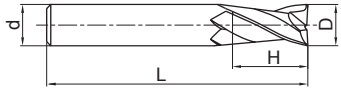
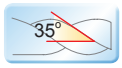
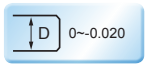


Figure 2

- Special for slot milling.
- Sharp cutting edge can achieve higher surface quality.





Ordering number	Basic dimension(mm)				Number of teeth Z	Geometry
	D	d	H	L		
NM-2E-D1.0	1.0	4	3	50	2	Figure 1
NM-2E-D2.0	2.0	4	6	50	2	Figure 1
NM-2E-D3.0	3.0	6	8	50	2	Figure 1
NM-2E-D4.0	4.0	6	11	50	2	Figure 1
NM-2E-D5.0	5.0	6	13	50	2	Figure 1
NM-2E-D6.0	6.0	6	16	50	2	Figure 2
NM-2E-D8.0	8.0	8	20	60	2	Figure 2
NM-2E-D10.0	10.0	10	25	75	2	Figure 2
NM-2E-D12.0	12.0	12	30	75	2	Figure 2

Applicable material table

◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel、Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC	~68HRC						
								◎	○		

Code key B176 Cutting parameters B270 Graphics category and identification B177 Non-standard tailor made B289-B290

4-flute flattened end mills with straight shank


Side face


Step shoulder


Straight slot

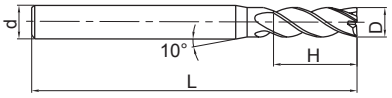


Figure 1

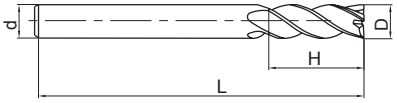
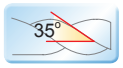


Figure 2

- Long cutting edge for finish side milling copper electrode.



Ordering number	Basic dimension(mm)				Number of teeth Z	Geometry
	D	d	H	L		
NM-4E-D3.0	3.0	6	8	50	4	Figure 1
NM-4E-D4.0	4.0	6	11	50	4	Figure 1
NM-4E-D5.0	5.0	6	13	50	4	Figure 1
NM-4E-D6.0	6.0	6	16	50	4	Figure 2
NM-4E-D8.0	8.0	8	20	60	4	Figure 2
NM-4E-D10.0	10.0	10	25	75	4	Figure 2
NM-4E-D12.0	12.0	12	30	75	4	Figure 2

Applicable material table

◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel、Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC	~68HRC						
								◎	○		

Code key B176 Cutting parameters B271 Graphics category and identification B177 Non-standard tailor made B289-B290

2-flute ball nose end mills with straight shank


Profile


Cavity


Ball nose slot

- For profile milling.
- Very perfect surface quality.

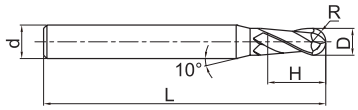


Figure 1

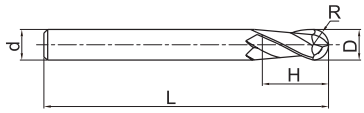
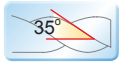
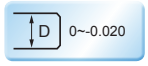
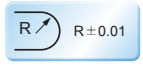


Figure 2







Ordering number	Basic dimension(mm)					Number of teeth Z	Geometry
	D	R	d	H	L		
NM-2B-R0.5	1.0	0.5	4.0	2.0	50	2	Figure 1
NM-2B-R0.75	1.5	0.75	4.0	3.0	50	2	Figure 1
NM-2B-R1.0	2.0	1.0	4.0	4.0	50	2	Figure 1
NM-2B-R1.25	2.5	1.25	4.0	5.0	50	2	Figure 1
NM-2B-R1.5	3.0	1.5	6.0	6.0	50	2	Figure 1
NM-2B-R1.75	3.5	1.75	6.0	8.0	50	2	Figure 1
NM-2B-R2.0	4.0	2.0	6.0	8.0	50	2	Figure 1
NM-2B-R2.5	5.0	2.5	6.0	10.0	50	2	Figure 1
NM-2B-R3.0	6.0	3.0	6.0	12.0	50	2	Figure 2
NM-2B-R4.0	8.0	4.0	8.0	16.0	60	2	Figure 2
NM-2B-R5.0	10.0	5.0	10.0	20.0	75	2	Figure 2
NM-2B-R6.0	12.0	6.0	12.0	24.0	75	2	Figure 2

Applicable material table

◎Very suitable ○Suitable

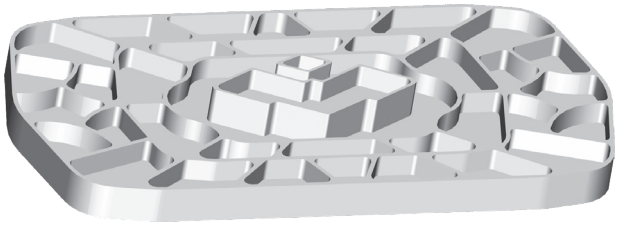
Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel、Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC	~68HRC						
								◎	○		

Code key B176 Cutting parameters B273 Graphics category and identification B177 Non-standard tailor made B289-B290

AL series end mills for machining aluminum

Completed product category, realize machining Al alloy from general to ultrahigh speed.

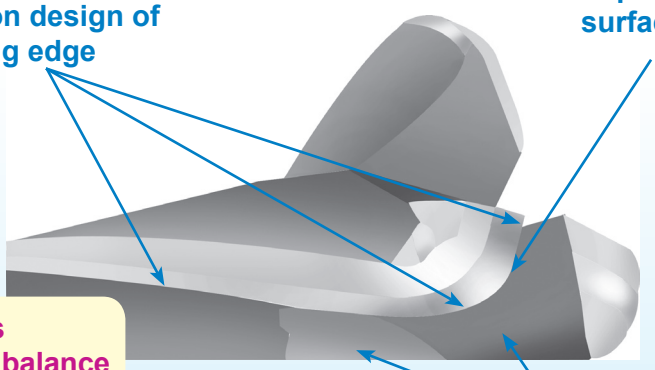
- Tool type：AL-3E-D6.0
- Size：Ø6.0mm
- Workpiece material：LC4
- Rotating speed：13000r/min (250m/min)
- Feed speed：1950mm/r (0.15mm/r)
- Axial cutting depth：Ap=9.0mm
- Radial cutting depth：Ae=1.0mm
- Cutting style : complicated cavity machining
- Cooling system: air blow
- Machine：MIKRON UCP 1000



Brand-new AL-2R, AL-2RL, AL-3R, AL-3RL series are released for ultrahigh speed milling aerospace Al alloy.

Anti-vibration design of whole cutting edge

Wiper benefit to improve surface quality

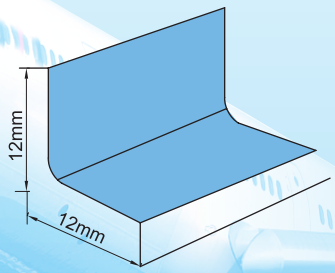


All end mills pass through dynamic balance and security tests.

Big chip pocket is suitable for high feed machining

AL-3R ultrahigh speed machining performance

- Tool type：AL-3R-D20.0R3.0-AIR
- Size：Ø20.0mm
- Workpiece material：A7075
- Cutting speed：1500m/min
- Rotating speed：25000r/min
- Feed rate per tooth：0.48mm/r
- Feed speed：12000mm/min
- Axial cutting depth：Ap=12mm
- Radial cutting depth：Ae=12mm
- Metal removal rate：1800cm^3/min
- Cutting style: side milling (down milling)
- Cooling system: air blow
- Machine: horizontal machining center



Note: cutting speed reach 1500m/min, metal removal rate is 1800cm^3/min

2-flute flattened end mills with straight shank


Side face


Step shoulder


Straight slot

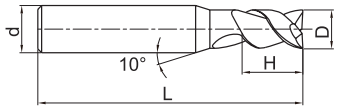


Figure 1

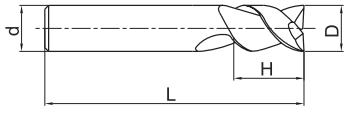
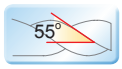


Figure 2

- Good chip removal performance, high machining efficiency.



Ordering number	Basic dimension(mm)				Number of teeth Z	Geometry
	D	d	H	L		
AL-2E-D1.0	1.0	4	3	50	2	Figure 1
AL-2E-D1.5	1.5	4	4	50	2	Figure 1
AL-2E-D2.0	2.0	4	6	50	2	Figure 1
AL-2E-D2.5	2.5	4	7	50	2	Figure 1
AL-2E-D3.0	3.0	6	9	50	2	Figure 1
AL-2E-D4.0	4.0	6	12	50	2	Figure 1
AL-2E-D5.0	5.0	6	15	50	2	Figure 1
AL-2E-D6.0	6.0	6	18	60	2	Figure 2
AL-2E-D8.0	8.0	8	20	60	2	Figure 2
AL-2E-D10.0	10.0	10	30	75	2	Figure 2
AL-2E-D12.0	12.0	12	32	75	2	Figure 2
AL-2E-D16.0	16.0	16	45	100	2	Figure 2
AL-2E-D20.0	20.0	20	45	100	2	Figure 2

Applicable material table

◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel、Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC	~68HRC						
									◎		

Code key B176 Cutting parameters B275 Graphics category and identification B177 Non-standard tailor made B289-B290

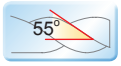
2-flute long cutting edge flattened end mills with straight shank


Side face


Step shoulder


Straight slot

- AL-2E series with long cutting edge.



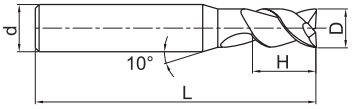


Figure 1

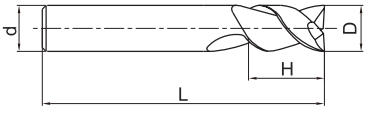


Figure 2

Ordering number	Basic dimension(mm)				Number of teeth Z	Geometry
	D	d	H	L		
AL-2EL-D3.0	3.0	6	12	60	2	Figure 1
AL-2EL-D4.0	4.0	6	16	60	2	Figure 1
AL-2EL-D5.0	5.0	6	20	60	2	Figure 1
AL-2EL-D6.0	6.0	6	25	75	2	Figure 2
AL-2EL-D8.0	8.0	8	32	75	2	Figure 2
AL-2EL-D10.0	10.0	10	45	100	2	Figure 2
AL-2EL-D12.0	12.0	12	45	100	2	Figure 2
AL-2EL-D16.0	16.0	16	65	150	2	Figure 2
AL-2EL-D20.0	20.0	20	75	150	2	Figure 2

Applicable material table

◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel、Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC	~68HRC						
									◎		

Code key B176 Cutting parameters B275 Graphics category and identification B177 Non-standard tailor made B289-B290

3-flute flattened end mills with straight shank


Side face


Step shoulder


Straight slot

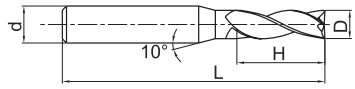


Figure 1

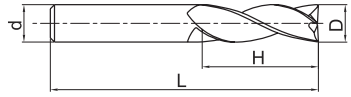
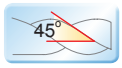


Figure 2

- Outstanding cutting performance without vibration, realize high precision machining.



Ordering number	Basic dimension(mm)				Number of teeth Z	Geometry
	D	d	H	L		
AL-3E-D1.0	1.0	4	3	50	3	Figure 1
AL-3E-D1.5	1.5	4	4	50	3	Figure 1
AL-3E-D2.0	2.0	4	6	50	3	Figure 1
AL-3E-D2.5	2.5	4	7	50	3	Figure 1
AL-3E-D3.0	3.0	6	9	50	3	Figure 1
AL-3E-D4.0	4.0	6	12	50	3	Figure 1
AL-3E-D5.0	5.0	6	15	50	3	Figure 1
AL-3E-D6.0	6.0	6	18	60	3	Figure 2
AL-3E-D8.0	8.0	8	20	60	3	Figure 2
AL-3E-D10.0	10.0	10	30	75	3	Figure 2
AL-3E-D12.0	12.0	12	32	75	3	Figure 2
AL-3E-D16.0	16.0	16	45	100	3	Figure 2
AL-3E-D20.0	20.0	20	45	100	3	Figure 2

Applicable material table

◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel、Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC	~68HRC						
									◎		

Code key B176 Cutting parameters B276 Graphics category and identification B177 Non-standard tailor made B289-B290

2-flute ball nose end mills with straight shank


Profile


Cavity


Ball nose slot

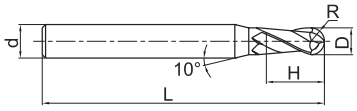


Figure 1

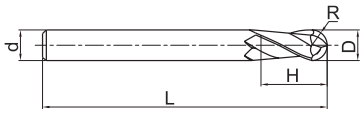


Figure 2

- For profile milling Al alloy.

Ordering number	Basic dimension(mm)					Number of teeth Z	Geometry
	D	R	d	H	L		
AL-2B-R1.0	2.0	1.0	6.0	4.0	60	2	Figure 1
AL-2B-R1.5	3.0	1.5	6.0	6.0	60	2	Figure 1
AL-2B-R2.0	4.0	2.0	6.0	8.0	60	2	Figure 1
AL-2B-R2.5	5.0	2.5	6.0	10.0	60	2	Figure 1
AL-2B-R3.0	6.0	3.0	6.0	12.0	60	2	Figure 2
AL-2B-R4.0	8.0	4.0	8.0	16.0	75	2	Figure 2
AL-2B-R5.0	10.0	5.0	10.0	20.0	75	2	Figure 2
AL-2B-R6.0	12.0	6.0	12.0	24.0	75	2	Figure 2

Applicable material table

◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel、Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC	~68HRC						
									◎		

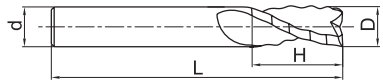
Code key B176 Cutting parameters B277 Graphics category and identification B177 Non-standard tailor made B289-B290

3-flute corrugated edges flattened end mills with straight shank

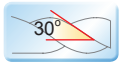

Side face

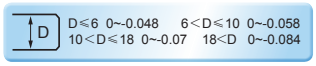

Step shoulder


Straight slot



- For rough machining Al alloy.





Ordering number	Basic dimension(mm)				Number of teeth Z
	D	d	H	L	
AL-3W-D6.0	6	6	16	50	3
AL-3W-D8.0	8	8	20	60	3
AL-3W-D10.0	10	10	25	75	3
AL-3W-D12.0	12	12	30	75	3
AL-3W-D16.0	16	16	45	100	3
AL-3W-D20.0	20	20	45	100	3

Applicable material table

◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel、Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC	~68HRC						
									◎		

Code key B176 Cutting parameters B278 Graphics category and identification B177 Non-standard tailor made B289-B290

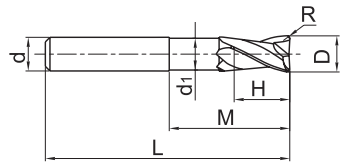
2-flute R end mills with straight shank


Radius shoulder

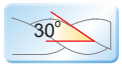

Profile


Radius corner slot

Ultrahigh speed



- Very suitable for ultrahigh speed machining aerospace Al components.



Ordering number	Basic dimension(mm)							Number of teeth Z
	D	R	d	d_1	H	M	L	
AL-2R-D6.0R1.0- AIR	6	1.0	6	5.5	7	20	57	2
AL-2R-D8.0R1.0- AIR	8	1.0	8	7.4	9	26	63	2
AL-2R-D10.0R1.0- AIR	10	1.0	10	9.2	11	31	72	2
AL-2R-D10.0R2.0- AIR	10	2.0	10	9.2	11	31	72	2
AL-2R-D12.0R1.0- AIR	12	1.0	12	11	12	37	83	2
AL-2R-D12.0R2.0- AIR	12	2.0	12	11	12	37	83	2
AL-2R-D12.0R3.0- AIR	12	3.0	12	11	12	37	83	2
AL-2R-D16.0R1.0- AIR	16	1.0	16	15	16	43	92	2
AL-2R-D16.0R2.0- AIR	16	2.0	16	15	16	43	92	2
AL-2R-D16.0R3.0- AIR	16	3.0	16	15	16	43	92	2
AL-2R-D16.0R4.0- AIR	16	4.0	16	15	16	43	92	2
AL-2R-D20.0R1.0- AIR	20	1.0	20	19	20	53	104	2
AL-2R-D20.0R2.0- AIR	20	2.0	20	19	20	53	104	2
AL-2R-D20.0R3.0- AIR	20	3.0	20	19	20	53	104	2
AL-2R-D20.0R4.0- AIR	20	4.0	20	19	20	53	104	2
AL-2R-D20.0R5.0- AIR	20	5.0	20	19	20	53	104	2
AL-2R-D20.0R6.0- AIR	20	6.0	20	19	20	53	104	2

Applicable material table

◎Very suitable ○Suitable

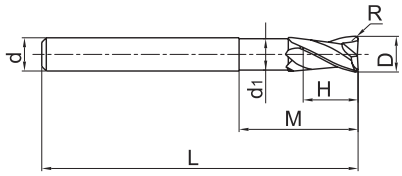
Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel、Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC	~68HRC						
									◎		

Code key B176 Cutting parameters B279 Graphics category and identification B177 Non-standard tailor made B289-B290

2-flute R end mills with long straight shank

Radius shoulder | Profile | Radius corner slot

Ultrahigh speed



- Very suitable for ultrahigh speed machining aerospace Al component.

30° | D | D≤12 0~-0.020 12<D 0~-0.030

Ordering number	Basic dimension(mm)							Number of teeth
	D	R	d	d_1	H	M	L	Z
AL-2RL-D6.0R1.0- AIR	6	1.0	6	5.5	7	43	80	2
AL-2RL-D8.0R1.0- AIR	8	1.0	8	7.4	9	53	90	2
AL-2RL-D10.0R1.0- AIR	10	1.0	10	9.2	11	59	100	2
AL-2RL-D10.0R2.0- AIR	10	2.0	10	9.2	11	59	100	2
AL-2RL-D12.0R1.0- AIR	12	1.0	12	11	12	74	120	2
AL-2RL-D12.0R2.0- AIR	12	2.0	12	11	12	74	120	2
AL-2RL-D12.0R3.0- AIR	12	3.0	12	11	12	74	120	2
AL-2RL-D16.0R1.0- AIR	16	1.0	16	15	16	84	140	2
AL-2RL-D16.0R2.0- AIR	16	2.0	16	15	16	84	140	2
AL-2RL-D16.0R3.0- AIR	16	3.0	16	15	16	84	140	2
AL-2RL-D16.0R4.0- AIR	16	4.0	16	15	16	84	140	2
AL-2RL-D20.0R1.0- AIR	20	1.0	20	19	20	89	140	2
AL-2RL-D20.0R2.0- AIR	20	2.0	20	19	20	89	140	2
AL-2RL-D20.0R3.0- AIR	20	3.0	20	19	20	89	140	2
AL-2RL-D20.0R4.0- AIR	20	4.0	20	19	20	89	140	2
AL-2RL-D20.0R5.0- AIR	20	5.0	20	19	20	89	140	2
AL-2RL-D20.0R6.0- AIR	20	6.0	20	19	20	89	140	2

Applicable material table

◎Very suitable ○Suitable

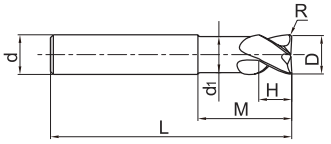
Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel、Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC	~68HRC						
									◎		

Code key B176 | Cutting parameters B280 | Graphics category and identification B177 | Non-standard tailor made B289-B290

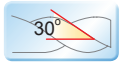
3-flute R end mills with straight shank

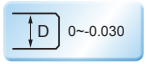
Radius shoulder | Profile | Radius corner slot

Ultrahigh speed



- Very suitable for ultrahigh speed machining aerospace Al components.





Ordering number	Basic dimension(mm)							Number of teeth
	D	R	d	d_1	H	M	L	Z
AL-3R-D12.0R1.0- AIR	12	1.0	12	11	12	37	83	3
AL-3R-D12.0R2.0- AIR	12	2.0	12	11	12	37	83	3
AL-3R-D12.0R3.0- AIR	12	3.0	12	11	12	37	83	3
AL-3R-D16.0R1.0- AIR	16	1.0	16	15	16	43	92	3
AL-3R-D16.0R2.0- AIR	16	2.0	16	15	16	43	92	3
AL-3R-D16.0R3.0- AIR	16	3.0	16	15	16	43	92	3
AL-3R-D16.0R4.0- AIR	16	4.0	16	15	16	43	92	3
AL-3R-D20.0R1.0- AIR	20	1.0	20	19	20	53	104	3
AL-3R- D20.0R2.0- AIR	20	2.0	20	19	20	53	104	3
AL-3R- D20.0R3.0- AIR	20	3.0	20	19	20	53	104	3
AL-3R-D20.0R4.0- AIR	20	4.0	20	19	20	53	104	3
AL-3R- D20.0R5.0- AIR	20	5.0	20	19	20	53	104	3
AL-3R- D20.0R6.0- AIR	20	6.0	20	19	20	53	104	3

Applicable material table

◎Very suitable ○Suitable

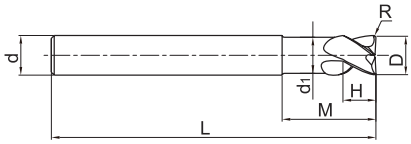
Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel、Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC	~68HRC						
									◎		

Code key B176 | Cutting parameters B281 | Graphics category and identification B177 | Non-standard tailor made B289-B290

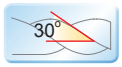
3-flute R end mills with long straight shank

Radius shoulder | Profile | Radius corner slot

Ultrahigh speed



- Very suitable for ultrahigh speed machining aerospace Al component.



Ordering number	Basic dimension(mm)							Number of teeth
	D	R	d	d_1	H	M	L	Z
AL-3RL-D12.0R1.0- AIR	12	1.0	12	11	12	74	120	3
AL-3RL-D12.0R2.0- AIR	12	2.0	12	11	12	74	120	3
AL-3RL-D12.0R3.0- AIR	12	3.0	12	11	12	74	120	3
AL-3RL-D16.0R1.0- AIR	16	1.0	16	15	16	84	140	3
AL-3RL-D16.0R2.0- AIR	16	2.0	16	15	16	84	140	3
AL-3RL-D16.0R3.0- AIR	16	3.0	16	15	16	84	140	3
AL-3RL-D16.0R4.0- AIR	16	4.0	16	15	16	84	140	3
AL-3RL-D20.0R1.0- AIR	20	1.0	20	19	20	89	140	3
AL-3RL- D20.0R2.0- AIR	20	2.0	20	19	20	89	140	3
AL-3RL- D20.0R3.0- AIR	20	3.0	20	19	20	89	140	3
AL-3RL-D20.0R4.0- AIR	20	4.0	20	19	20	89	140	3
AL-3RL- D20.0R5.0- AIR	20	5.0	20	19	20	89	140	3
AL-3RL- D20.0R6.0- AIR	20	6.0	20	19	20	89	140	3

Applicable material table

◎Very suitable ○Suitable

Workpiece material											
Carbon steel	Alloy steel	Pre-hardened steel、Hardened steel				Stainless steel	Cast iron, Nodular cast iron	Copper alloy	Aluminum alloy	Titanium alloy	Heat resistant alloy
		~40HRC	~50HRC	~60HRC	~68HRC						
									◎		

Code key B176 | Cutting parameters B282 | Graphics category and identification B177 | Non-standard tailor made B289-B290