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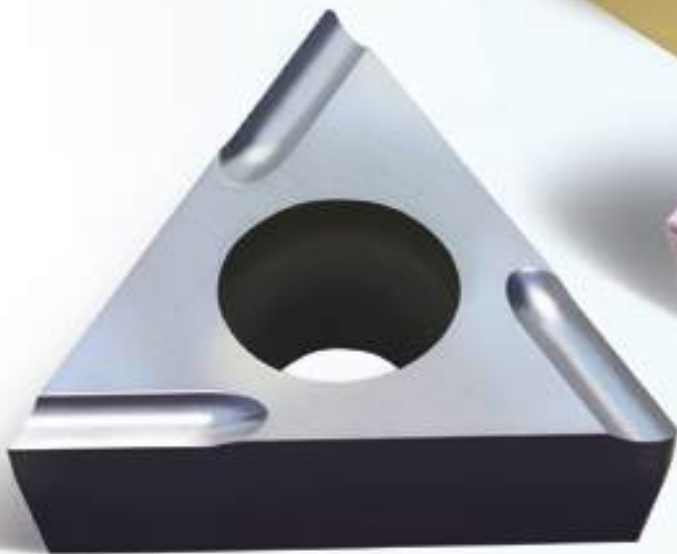
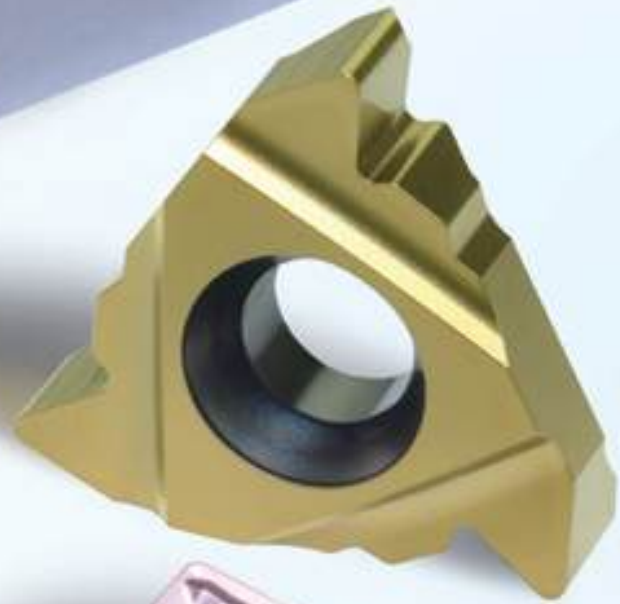
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General technical information	D1-D30
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Turning Tools

*General turning tools
Parting and grooving tools
Threading tools*



Turning



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Guide to selecting general turning tools

Selection B

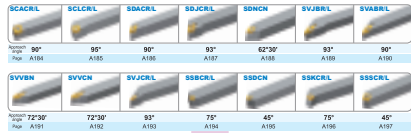
D-type clamping system



P-type clamping system



S-type clamping system

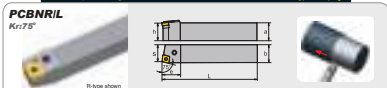


DCLNR/L

Approach angle
Page 95°
A166

Step 1: I want to order tool holders
• Approach angle, • Clamping system

Corresponding tool holders of insert CN



Type	Stock	Basic dimensions(mm)	Screw	Shim	Wrench	Lever	Shim pin
PCBNR/L	R	L	d	b	L ₁	L ₂	L ₃
2020K12	A	20 20 125 20 17 27	LEM12-21	C12AP	W12CL	L4	SP4
2020M12	A	25 25 150 25 22 27	LEM12-21	C12AP	W12CL	L4	SP4
2020P12	A	32 32 170 32 27 27	LEM12-21	C12AP	W12CL	L4	SP4
2020M16	A	32 32 150 32 22 33	LEM12-21	C12AP	W12CL	L4	SP4
2020P16	A	32 32 170 32 27 33	LEM12-21	C12AP	W12CL	L4	SP4
4040R16	A	40 40 200 40 35 35	LEM12-25	C12AP	W12CL	L8	SP8
4040R18	A	40 40 200 40 35 35	LEM12-25	C12AP	W12CL	L8	SP8
4040R19	A	40 40 200 40 35 35	LEM12-25	C12AP	W12CL	L8	SP8
4040R20	A	40 40 200 40 35 35	LEM12-25	C12AP	W12CL	L8	SP8
4040R21	A	40 40 200 40 35 35	LEM12-25	C12AP	W12CL	L8	SP8
4040R22	A	40 40 200 40 35 35	LEM12-25	C12AP	W12CL	L8	SP8

Applicable inserts	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining
Application	DF	WGM	DR	HDR	HR
Inserts shape	SP	PM	DR	HR	HR
	WGF	DM	ER	HR	HR
	EF	EM	ER	HR	HR
	NF	NM	ER	HR	HR
		NR	ER	HR	HR
		LR	ER	HR	HR
		LR	ER	HR	HR

CN (Negative inserts)

Inserts shape	Type	Dimensions(mm)	Coated cemented carbide
NM	CNM120404-NM	12.7 12.7 4.76 5.16 0.4	•
	CNM120408-NM	12.7 12.7 4.76 5.16 0.8	•
	CNM120412-NM	12.7 12.7 4.76 5.16 1.2	•
	CNM120416-NM	12.7 12.7 4.76 5.16 1.6	•
	CNM120420-NM	12.7 12.7 4.76 5.16 2.0	•
	CNM120424-NM	12.7 12.7 4.76 5.16 2.4	•
	CNM120428-NM	12.7 12.7 4.76 5.16 2.8	•
	CNM120432-NM	12.7 12.7 4.76 5.16 3.2	•
	CNM120436-NM	12.7 12.7 4.76 5.16 3.6	•
	CNM120440-NM	12.7 12.7 4.76 5.16 4.0	•
	CNM120444-NM	12.7 12.7 4.76 5.16 4.4	•
	CNM120448-NM	12.7 12.7 4.76 5.16 4.8	•
	CNM120452-NM	12.7 12.7 4.76 5.16 5.2	•
	CNM120456-NM	12.7 12.7 4.76 5.16 5.6	•
	CNM120460-NM	12.7 12.7 4.76 5.16 6.0	•
	CNM120464-NM	12.7 12.7 4.76 5.16 6.4	•
	CNM120468-NM	12.7 12.7 4.76 5.16 6.8	•
	CNM120472-NM	12.7 12.7 4.76 5.16 7.2	•
	CNM120476-NM	12.7 12.7 4.76 5.16 7.6	•
	CNM120480-NM	12.7 12.7 4.76 5.16 8.0	•
	CNM120484-NM	12.7 12.7 4.76 5.16 8.4	•
	CNM120488-NM	12.7 12.7 4.76 5.16 8.8	•
	CNM120492-NM	12.7 12.7 4.76 5.16 9.2	•
	CNM120496-NM	12.7 12.7 4.76 5.16 9.6	•
	CNM120500-NM	12.7 12.7 4.76 5.16 10.0	•
	CNM120504-NM	12.7 12.7 4.76 5.16 10.4	•
	CNM120508-NM	12.7 12.7 4.76 5.16 10.8	•
	CNM120512-NM	12.7 12.7 4.76 5.16 11.2	•
	CNM120516-NM	12.7 12.7 4.76 5.16 11.6	•
	CNM120520-NM	12.7 12.7 4.76 5.16 12.0	•
	CNM120524-NM	12.7 12.7 4.76 5.16 12.4	•
	CNM120528-NM	12.7 12.7 4.76 5.16 12.8	•
	CNM120532-NM	12.7 12.7 4.76 5.16 13.2	•
	CNM120536-NM	12.7 12.7 4.76 5.16 13.6	•
	CNM120540-NM	12.7 12.7 4.76 5.16 14.0	•
	CNM120544-NM	12.7 12.7 4.76 5.16 14.4	•
	CNM120548-NM	12.7 12.7 4.76 5.16 14.8	•
	CNM120552-NM	12.7 12.7 4.76 5.16 15.2	•
	CNM120556-NM	12.7 12.7 4.76 5.16 15.6	•
	CNM120560-NM	12.7 12.7 4.76 5.16 16.0	•
	CNM120564-NM	12.7 12.7 4.76 5.16 16.4	•
	CNM120568-NM	12.7 12.7 4.76 5.16 16.8	•
	CNM120572-NM	12.7 12.7 4.76 5.16 17.2	•
	CNM120576-NM	12.7 12.7 4.76 5.16 17.6	•
	CNM120580-NM	12.7 12.7 4.76 5.16 18.0	•
	CNM120584-NM	12.7 12.7 4.76 5.16 18.4	•
	CNM120588-NM	12.7 12.7 4.76 5.16 18.8	•
	CNM120592-NM	12.7 12.7 4.76 5.16 19.2	•
	CNM120596-NM	12.7 12.7 4.76 5.16 19.6	•
	CNM120600-NM	12.7 12.7 4.76 5.16 20.0	•
	CNM120604-NM	12.7 12.7 4.76 5.16 20.4	•
	CNM120608-NM	12.7 12.7 4.76 5.16 20.8	•
	CNM120612-NM	12.7 12.7 4.76 5.16 21.2	•
	CNM120616-NM	12.7 12.7 4.76 5.16 21.6	•
	CNM120620-NM	12.7 12.7 4.76 5.16 22.0	•
	CNM120624-NM	12.7 12.7 4.76 5.16 22.4	•
	CNM120628-NM	12.7 12.7 4.76 5.16 22.8	•
	CNM120632-NM	12.7 12.7 4.76 5.16 23.2	•
	CNM120636-NM	12.7 12.7 4.76 5.16 23.6	•
	CNM120640-NM	12.7 12.7 4.76 5.16 24.0	•
	CNM120644-NM	12.7 12.7 4.76 5.16 24.4	•
	CNM120648-NM	12.7 12.7 4.76 5.16 24.8	•
	CNM120652-NM	12.7 12.7 4.76 5.16 25.2	•
	CNM120656-NM	12.7 12.7 4.76 5.16 25.6	•
	CNM120660-NM	12.7 12.7 4.76 5.16 26.0	•
	CNM120664-NM	12.7 12.7 4.76 5.16 26.4	•
	CNM120668-NM	12.7 12.7 4.76 5.16 26.8	•
	CNM120672-NM	12.7 12.7 4.76 5.16 27.2	•
	CNM120676-NM	12.7 12.7 4.76 5.16 27.6	•
	CNM120680-NM	12.7 12.7 4.76 5.16 28.0	•
	CNM120684-NM	12.7 12.7 4.76 5.16 28.4	•
	CNM120688-NM	12.7 12.7 4.76 5.16 28.8	•
	CNM120692-NM	12.7 12.7 4.76 5.16 29.2	•
	CNM120696-NM	12.7 12.7 4.76 5.16 29.6	•
	CNM120700-NM	12.7 12.7 4.76 5.16 30.0	•
	CNM120704-NM	12.7 12.7 4.76 5.16 30.4	•
	CNM120708-NM	12.7 12.7 4.76 5.16 30.8	•
	CNM120712-NM	12.7 12.7 4.76 5.16 31.2	•
	CNM120716-NM	12.7 12.7 4.76 5.16 31.6	•
	CNM120720-NM	12.7 12.7 4.76 5.16 32.0	•
	CNM120724-NM	12.7 12.7 4.76 5.16 32.4	•
	CNM120728-NM	12.7 12.7 4.76 5.16 32.8	•
	CNM120732-NM	12.7 12.7 4.76 5.16 33.2	•
	CNM120736-NM	12.7 12.7 4.76 5.16 33.6	•
	CNM120740-NM	12.7 12.7 4.76 5.16 34.0	•
	CNM120744-NM	12.7 12.7 4.76 5.16 34.4	•
	CNM120748-NM	12.7 12.7 4.76 5.16 34.8	•
	CNM120752-NM	12.7 12.7 4.76 5.16 35.2	•
	CNM120756-NM	12.7 12.7 4.76 5.16 35.6	•
	CNM120760-NM	12.7 12.7 4.76 5.16 36.0	•
	CNM120764-NM	12.7 12.7 4.76 5.16 36.4	•
	CNM120768-NM	12.7 12.7 4.76 5.16 36.8	•
	CNM120772-NM	12.7 12.7 4.76 5.16 37.2	•
	CNM120776-NM	12.7 12.7 4.76 5.16 37.6	•
	CNM120780-NM	12.7 12.7 4.76 5.16 38.0	•
	CNM120784-NM	12.7 12.7 4.76 5.16 38.4	•
	CNM120788-NM	12.7 12.7 4.76 5.16 38.8	•
	CNM120792-NM	12.7 12.7 4.76 5.16 39.2	•
	CNM120796-NM	12.7 12.7 4.76 5.16 39.6	•
	CNM120800-NM	12.7 12.7 4.76 5.16 40.0	•
	CNM120804-NM	12.7 12.7 4.76 5.16 40.4	•
	CNM120808-NM	12.7 12.7 4.76 5.16 40.8	•
	CNM120812-NM	12.7 12.7 4.76 5.16 41.2	•
	CNM120816-NM	12.7 12.7 4.76 5.16 41.6	•
	CNM120820-NM	12.7 12.7 4.76 5.16 42.0	•
	CNM120824-NM	12.7 12.7 4.76 5.16 42.4	•
	CNM120828-NM	12.7 12.7 4.76 5.16 42.8	•
	CNM120832-NM	12.7 12.7 4.76 5.16 43.2	•
	CNM120836-NM	12.7 12.7 4.76 5.16 43.6	•
	CNM120840-NM	12.7 12.7 4.76 5.16 44.0	•
	CNM120844-NM	12.7 12.7 4.76 5.16 44.4	•
	CNM120848-NM	12.7 12.7 4.76 5.16 44.8	•
	CNM120852-NM	12.7 12.7 4.76 5.16 45.2	•
	CNM120856-NM	12.7 12.7 4.76 5.16 45.6	•
	CNM120860-NM	12.7 12.7 4.76 5.16 46.0	•
	CNM120864-NM	12.7 12.7 4.76 5.16 46.4	•
	CNM120868-NM	12.7 12.7 4.76 5.16 46.8	•
	CNM120872-NM	12.7 12.7 4.76 5.16 47.2	•
	CNM120876-NM	12.7 12.7 4.76 5.16 47.6	•
	CNM120880-NM	12.7 12.7 4.76 5.16 48.0	•
	CNM120884-NM	12.7 12.7 4.76 5.16 48.4	•
	CNM120888-NM	12.7 12.7 4.76 5.16 48.8	•
	CNM120892-NM	12.7 12.7 4.76 5.16 49.2	•
	CNM120896-NM	12.7 12.7 4.76 5.16 49.6	•
	CNM120900-NM	12.7 12.7 4.76 5.16 50.0	•
	CNM120904-NM	12.7 12.7 4.76 5.16 50.4	•
	CNM120908-NM	12.7 12.7 4.76 5.16 50.8	•
	CNM120912-NM	12.7 12.7 4.76 5.16 51.2	•
	CNM120916-NM	12.7 12.7 4.76 5.16 51.6	•
	CNM120920-NM	12.7 12.7 4.76 5.16 52.0	•
	CNM120924-NM	12.7 12.7 4.76 5.16 52.4	•
	CNM120928-NM	12.7 12.7 4.76 5.16 52.8	•
	CNM120932-NM	12.7 12.7 4.76 5.16 53.2	•
	CNM120936-NM	12.7 12.7 4.76 5.16 53.6	•
	CNM120940-NM	12.7 12.7 4.76 5.16 54.0	•
	CNM120944-NM	12.7 12.7 4.76 5.16 54.4	•
	CNM120948-NM	12.7 12.7 4.76 5.16 54.8	•
	CNM120952-NM	12.7 12.7 4.76 5.16 55.2	•
	CNM120956-NM	12.7 12.7 4.76 5.16 55.6	•
	CNM120960-NM	12.7 12.7 4.76 5.16 56.0	•
	CNM120964-NM	12.7 12.7 4.76 5.16 56.4	•
	CNM120968-NM	12.7 12.7 4.76 5.16 56.8	•
	CNM120972-NM	12.7 12.7 4.76 5.16 57.2	•
	CNM120976-NM	12.7 12.7 4.76 5.16 57.6	•
	CNM120980-NM	12.7 12.7 4.76 5.16 58.0	•
	CNM120984-NM	12.7 12.7 4.76 5.16 58.4	•
	CNM120988-NM	12.7 12.7 4.76 5.16 58.8	•
	CNM120992-NM	12.7 12.7 4.76 5.16 59.2	•
	CNM120996-NM	12.7 12.7 4.76 5.16 59.6	•
	CNM121000-NM	12.7 12.7 4.76 5.16 60.0	•

Applicable tool



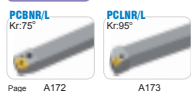
For finishing
DF
A54

Step 2: Details of tool holder
• Tool holder type, Size, • Operation genre
• Applicable inserts

Dimensions(mm)				
L	IC	S	d	r
12.9	12.7	4.76	5.16	0.4

Step 3: Details of insert
• Shape, • Size, • Chipbreaker, • Grade, • Stock
Applicable tool holders
• Approach angle, • Page

Applicable tool



Step 4: Return to locate tool holder

General turning

Guide to selecting turning tools

External parting, grooving and turning tools



Insert type, Chip-breaker, Size and grade

Page

Insert type, Chip-breaker, Size and grade

Page A313 A314

Type	Block	Basic (millimeters)					Applicable (means)	Inserts (mm)	Stone	Other (mm)	Warranty
		H	N	L	S	V					
ZSER	10S00100	16	16	160	100	20					
	10S00110	20	20	200	120	25					
	10S00120	25	25	250	150	30	Z16ER000000	500 WLD, 0.0277	W16-16C	SR40AC	W10SP
	10S00130	32	32	320	175	40					
	10S00140	40	40	400	225	50					
	10S00150	50	50	500	275	60					
	10S00160	63	63	630	350	75					
	10S00170	80	80	800	450	100					
	10S00180	100	100	1000	575	125					
	10S00190	125	125	1250	725	150	Z20ER000000	500 WMT17	W172-12C	SR40S 5	W10SP
ZSEL	10S00200	16	16	160	100	20					
	10S00210	20	20	200	120	25					
	10S00220	25	25	250	150	30	Z16EL000000	500 WLD, 0.0277	W16-16C	SR40AC	W10SP
	10S00230	32	32	320	175	40					
	10S00240	40	40	400	225	50					
	10S00250	50	50	500	275	60					
	10S00260	63	63	630	350	75					
	10S00270	80	80	800	450	100					
	10S00280	100	100	1000	575	125					
	10S00290	125	125	1250	725	150	Z20EL000000	500 WMT17	W172-12C	SR40S 5	W10SP

Figure 1 shows the schematic representation of the two types of the proposed metamaterials. (a) I-type: A unit cell with a vertical rod and a horizontal rod, with a gap 'g' between them. (b) L-type: A unit cell with a vertical rod and a horizontal rod, with a gap 'g' between them. The figure shows the unit cells and the corresponding periodic structures for both types.

3 Insert type, Chip-breaker, Size and grade

	ISO metric thread		General pitch thread	
	External thread	Internal thread	External thread	Internal thread
Pitch/ Number of pitch	0.5-6	0.5-6	0.5-5	0.5-5
Page	A298	A299	A300	A300

[illegible]

2 Insert type, Chip-breaker, Size and grade



TURNING

Turning Inserts Overview

Cemented carbide and cermet inserts

General
turning

Turning inserts overview

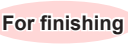
Negative inserts

For finishing

						
DNEG-NGF	VNEG-NGF	CNMG-DF	CNMG-SF	CNMG-EF	CNEG-NF	DNMG-DF
Cutting edge length 15	16	09,12	09,12	09,12	12	11,15
Page A62	A81	A54	A54	A54	A55	A61

							
DNMG-SF	DNMG-EF	DNEG-NF	SNMG-DF	SNMG-EF	SNMG-SF	TNMG-DF	TNMG-SF
Cutting edge length 11,15	11,15	15	09,12	09,12,15	09,12,15	16,22	11,16,22
Page A62	A62	A62	A67	A67	A67	A75	A75

							
TNMG-EF	VNMG-DF	VNMG-EF	VNEG-NF	VNMG-SF	WNMG-DF	WNMG-SF	WNMG-EF
Cutting edge length 11,16,22	16	16	16	16	06,08	06,08	06,08
Page A76	A81	A81	A81	A81	A83	A83	A84

						
WNEG-NF			CNMG-WGF	DNMX-WGF	TNMX-WGF	WNMG-WGF
Cutting edge length 08			12	11,15	16	06,08
Page A84			A54	A61	A75	A83

For semi-finishing

					
CNMG-WGM	DNMX-WGM	TNMX-WGM	WNMG-WGM		CNMG-PM
Cutting edge length 12	15	16	06,08		09,12,16,19
Page A55	A63	A76	A84		A55

							
CNMG-DM	CNMG-EM	CNMG-NM	DNMG-PM	DNMG-DM	DNMG-EM	DNMG-NM	SNMG-PM
Cutting edge length 09,12,16,19	12,16	12	11,15	11,15	11,15	15	09,12,15,19
Page A56	A56	A57	A63	A64	A64	A64	A68

							
SNMG-DM	SNMG-EM	SNMG-NM	TNMG-PM	TNMG-DM	TNMG-EM	VNMG-PM	VNMG-DM
Cutting edge length 09,12,15,19	12,15	12	11,16,22	11,16,22	16,22	16	16
Page A68	A69	A69	A76	A77	A77	A82	A82



						
VNMG-EM	VNMG-NM	WNMG-PM	WNMG-DM	WNMG-EM	WNMG-NM	
Cutting edge length	16	16	06,08	06,08	06,08	08
Page	A82	A82	A85	A85	A85	A86

For roughing						
	CNMG-SNR	DNMG-SNR	SNMG-SNR	TNMG-SNR	VNMG-SNR	WNMG-SNR
Cutting edge length	12, 16, 19	15	12	16	16	08
Page	A58	A65	A71	A78	A82	A86

       								
	CNMM-LR	DNMM-LR	SNMM-LR	TNMM-LR	CNMG-DR	CNMM-DR	CNMG-ER	CNMM-ER
Cutting edge length	12, 16, 19, 25	15	12, 15, 19, 25	16, 22	12, 16, 19	12, 16, 19, 25	12, 16, 19	25
Page	A57	A65	A69	A77	A58	A58	A58	A58

								
	DNMG-DR	DNMM-DR	DNMG-ER	DNMM-ER	SNMG-DR	SNMM-DR	SNMG-ER	SNMM-ER
Cutting edge length	15	15	15	15	12,15,19	12,15,19,25	12,15,19	25
Page	A65	A65	A65	A65	A70	A70-A71	A71	A71

			
TNMG-DR	TNMM-DR	TNMG-ER	WNMG-DR
Cutting edge length	16,22,27	16,22	06,08
Page	A78	A78	A86

For heavy machining						
	CNMM-HPR	SNMM-HPR	CNMM-HDR	DNMM-HDR	SNMM-HDR	TNMM-HDR
Cutting edge length	19, 25	19, 25	12, 16, 19	15	12, 15, 19, 25	16, 22, 27
Page	A59	A72	A59	A66	A72	A79

				For profiling		All round	
175.32-22/227	175.32-24	175.32-25	175.32-28		KNUX		CNMG
Cutting edge length	19	19, 30	19	19	16		12, 16, 19
Page	A88	A88	A88	A88	A87		A60

							
CNMM	DNMG	SNMG	SNMM	TNMG	TNMM	VNMG	
Cutting edge length	12, 19	15, 19	09, 12, 15, 19, 25	09, 12, 19, 25	11, 16, 22, 27, 33	16, 22, 27	16
Page	A60	A66	A73	A73-74	A79	A80	A82



TURNING

Turning Inserts Overview

General
turning

Turning inserts overview

Negative inserts

Without chipbreaker



CNMA

DNMA

SNMA

TNMA

WNMA

Cutting edge length

12,16,19

11,15

09,12,15,19

16,22,27

06,08

Page

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A80

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For extra finishing

-USF



CCGT-USF

DCGT-USF

TCGT-USF

VCGT-USF

DPGT-USF

VPGT-USF

Cutting edge length

09

07,11

11

08,11

07,11

08,11

Page

A89

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A105

A111

A114



CCGT-SF

DCGT-SF

TCGT-SF

VCGT-SF

VBGT-SF

CPGT-SF

DPGT-SF

TBGH-L

Cutting edge length

06,09

07,11

06,09,11

11

11

06,09

07,11

06

Page

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A100

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A110

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A112



TPGT-SF

TPGH-L

Cutting edge length

09,11

09,11

Page

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A113

For finishing



VCGT-NGF

VBET-NGF

CCMT-HF

CCMT-EF

DCMT-HF

DCMT-EF

SCMT-HF

Cutting edge length

16

16

06,09,12

06,09,12

07,11

07,11

09

Page

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A90

A93

A94

A98



SCMT-EF

TCMT-HF

TCMT-EF

VCGT-HF

VCGT-NF

VBMT-EF

VBMT-HF

VBET-NF

Cutting edge length

09

06,09,11,16

09,11,16

11

16

11,16

11

16

Page

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A102

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A105

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A108

For semi-finishing



CCMT-HM

CCMT-EM

DCMT-HM

DCMT-EM

SCMT-HM

SCMT-EM

TCMT-HM

Cutting edge length

06,09,12

06,09,12

07,11

07,11

09,12

09,12

09,11,16

Page

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Positive inserts



							
	TCMT-EM	VBMT-EM	VBMT-HM				
	Cutting edge length 09,11,16	11	16				
	Page	A102	A109	A109			
For roughing							
	VBMT-SNR	CCMT-HR	DCMT-HR	SCMT-HR	TCMT-HR	VBMT-HR	
	Cutting edge length 16	06,09,12	11	09,12	09,11,16,22	16	
	Page	A109	A91	A95	A99	A103	A109
For Al machining							
	CCGX-LC	DCGX-LC	SCGX-LC	TCGX-LC	VCGX-LC	CCGX-LH	DCGX-LH
	Cutting edge length 06,09,12	07,11	09,12	09,11,16	11,16,22	06,09,12	07,11
	Page	A91	A95	A99	A103	A106	A91-92
							
	RCGX-LH	SCGX-LH	TCGX-LH	VCGX-LH	RCM(G)T	RCMX	SCMT
	Cutting edge length 08	09,12	09,11,16	11,16,22	08,10,12,16	08,10,12,16,20,25,32	09,12
	Page	A96	A99	A104	A106	A96	A97
All round							
	TCMT	WCMX-53	CCMW	DCMW	SCMW	TCMW	SPMW
	Cutting edge length 22	04,06,08	06,09,12	07,11	06,09,12	11,16,22	09,12
	Page	A104	A107	A92	A95	A99	A104

New

PCBN&PCD inserts

PCBN inserts							
	CNGA	DNGA	SNGA	TNGA	VNGA	WNGA	
	Cutting edge length 12	15	12	16	16	08	
	Page	A118	A121	A126	A130	A133	A136
PCBN inserts turning case							
	CNGN	DNGN	SNGN	TNGN	VNGN	WNGN	
	Cutting edge length 12	15	12	16	16	08	
	Page	A120	A125	A129	A132	A135	A138



TURNING

Turning Inserts Overview

General
turning

Turning inserts overview

Positive inserts

PCBN inserts

					
	CCGW	DCGW	TCGW	VBGW	VCGW
Cutting edge width	06,09,12	07,11	09,11	16	16
Page	A139	A140	A141	A142	A143

PCD 0° Front Angle Blade

					
	CCGW□□AF	DCGW□□AF	TCGW□□AF	VBGW□□AF	VCGW□□AF
Cutting edge length	06,09,12	07,11	09,11	16	16
Page	A144	A145	A146	A147	A148

PCD 7° Front Angle Blade

					
	CCMX□□AF	DCMX□□AF	TCMX□□AF	VBMX□□AF	VCMX□□AF
Cutting edge width	06,09,12	07,11	09,11	16	16
Page	A144	A145	A146	A147	A148

Ceramic inserts

		
	RCGN	RPGN
Cutting edge width	09,12	09,12
Page	A152	A152

Parting and grooving inserts

Little squirrel series

QC series shallow grooving inserts

				
	QC□□R/L	QC□□R/L□□□R	ZP□D-MG	ZP□S-MG
Cutting edge width	1.1~4.8	1.0~4.0	1.5,2.0,2.5,3.4,5,6	2.5,3.4,5,6
Page	A267-268	A268	A259	A259

							
	ZT□D-MG	ZT□D-MM	ZT□S-MG	ZT□D-EG	ZT□D-EG	ZIMF-NM	ZIMF-SM
Cutting edge width	2.5,3.4,5,6	1.5,2.3,4.5,6,8	5,6	1-2.4(tailor-made)	2.4-6.5(tailor-made)	3.4,5,6	3.4,5,6
Page	A260	A260	A260	A261	A261	A262	A262

							
	ZR□D-MG	ZR□D-NM	ZR□D-EG	ZIGQ-NM	ZIGQ-NF	ZR□D-LH	ZILD-LC
Cutting edge width	2.5,3.4,5,6	3.4,5,6	3.4,5,6	3.4,5,6	3.4,5,6	6,8	8
Page	A263	A263	A263	A264	A264	A265	A265



Supplemental series



ZQMX-1E

Cutting edge width	3.125, 4.125, 5.125, 6.4, 7.05
Page	A269

General turning

Turning inserts overview

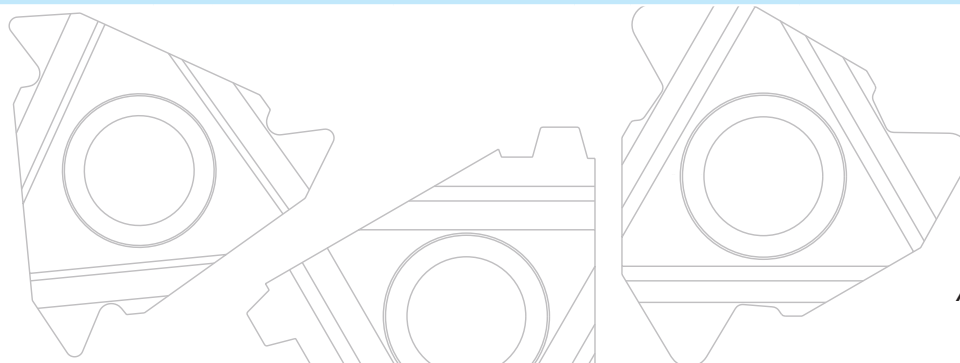
Threading inserts

Right hand type shown	ISO metric thread		General pitch thread		Whitworth thread	
	External thread	Internal thread	External thread	Internal thread	External thread	Internal thread
Pitch/ Number of pitch	0.5~6	0.5~6	0.5~5	0.5~5	8~19	8~19
Page	A298	A299	A300	A300	A301	A301

Right hand type shown	Unified thread		British Standard pipe thread		American standard pipe thread	
	External thread	Internal thread	External thread	Internal thread	External thread	Internal thread
Pitch/ Number of pitch	8~24	8~24	11~28	11~28	8~27	8~27
Page	A302	A302	A303	A303	A304	A304

Right hand type shown	ISO metric thread (Thin type)		General pitch thread (Thin type)		Whitworth thread (Thin type)	
	External thread	Internal thread	External thread	Internal thread	External thread	Internal thread
Pitch/ Number of pitch	0.5~3.0	0.5~3.0	0.5~5.0(5~48)	0.5~5.0(5~48)	8~16	8~16
Page	A306	A306	A307	A307	A308	A308

Right hand type shown	Unified thread (Thin type)		British Standard pipe thread (Thin type)		American standard pipe thread (Thin type)	
	External thread	Internal thread	External thread	Internal thread	External thread	Internal thread
Pitch/ Number of pitch	8~20	8~20	11~28	11~28	8~27	8~27
Page	A309	A309	A310	A310	A311	A311





Tool holders for external turning

D-type clamping system

DCLNR/L	DDJNR/L	DSBNR/L	DTGNR/L	DVVNN	DVJNR/L	DWLNR/L
						
Approach angle 95°	93°	75°	91°	72°30'	93°	95°
Page A166	A167	A168	A169	A170	A170	A171

P-type clamping system

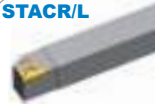
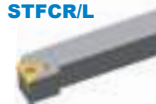
PCBNR/L	PCLNR/L	PDJNR/L	PDPNN	PSBNR/L	PSDNN	PSKNR/L
						
Approach angle 75°	95°	93°	62°30'	75°	45°	75°
Page A172	A173	A174	A175	A176	A177	A178

PSSNR/L	PTFNR/L	PTTNR/L	PTGNR/L	PWLNR/L
				
Approach angle 45°	90°	60°	90°	95°
Page A179	A180	A181	A182	A183

S-type clamping system

SCACR/L	SCLCR/L	SDACR/L	SDJCR/L	SDNCN	SVJBR/L	SVABR/L
						
Approach angle 90°	95°	90°	93°	62°30'	93°	90°
Page A184	A185	A186	A187	A188	A189	A190

SVVBN	SVVCN	SVJCR/L	SSBCR/L	SSDCN	SSKCR/L	SSSCR/L
						
Approach angle 72°30'	72°30'	93°	75°	45°	75°	45°
Page A191	A192	A193	A194	A195	A196	A197

STACR/L	STFCR/L	STGCR/L	STECR/L	SWACR/L	SRDCN	SRGCR/L
						
Approach angle 90°	90°	91°	60°	90°		
Page A198	A198	A199	A200	A201	A202	A203



C-type clamping system



Approach angle	93°	63°
Page	A204	A204

Turning tool holders for ceramic inserts



Approach angle		
Page	A205	A205

Turning tool holders for internal machining

P-type clamping system



Approach angle	95°	62°30'	93°	75°	90°	95°
Page	A212	A213	A214	A215	A216	A217

S-type clamping system



Approach angle	95°	107°30'	93°	95°	75°	90°	107°30'
Page	A218	A219	A220	A221	A222	A223	A224



Approach angle	93°	107°30'	93°	95°	107°30'	93°	93°
Page	A225	A226	A227	A228	A229	A230	A231



TURNING

Turning Tools Overview

General
turning

Turning tools overview



Approach angle	90°	95°
Page	A232	A233

Damping tool holders



Approach angle	95°	107°30'	93°	93°	107°30'	93°
Page	A235	A236	A237	A238	A239	A240

Parting and grooving tools



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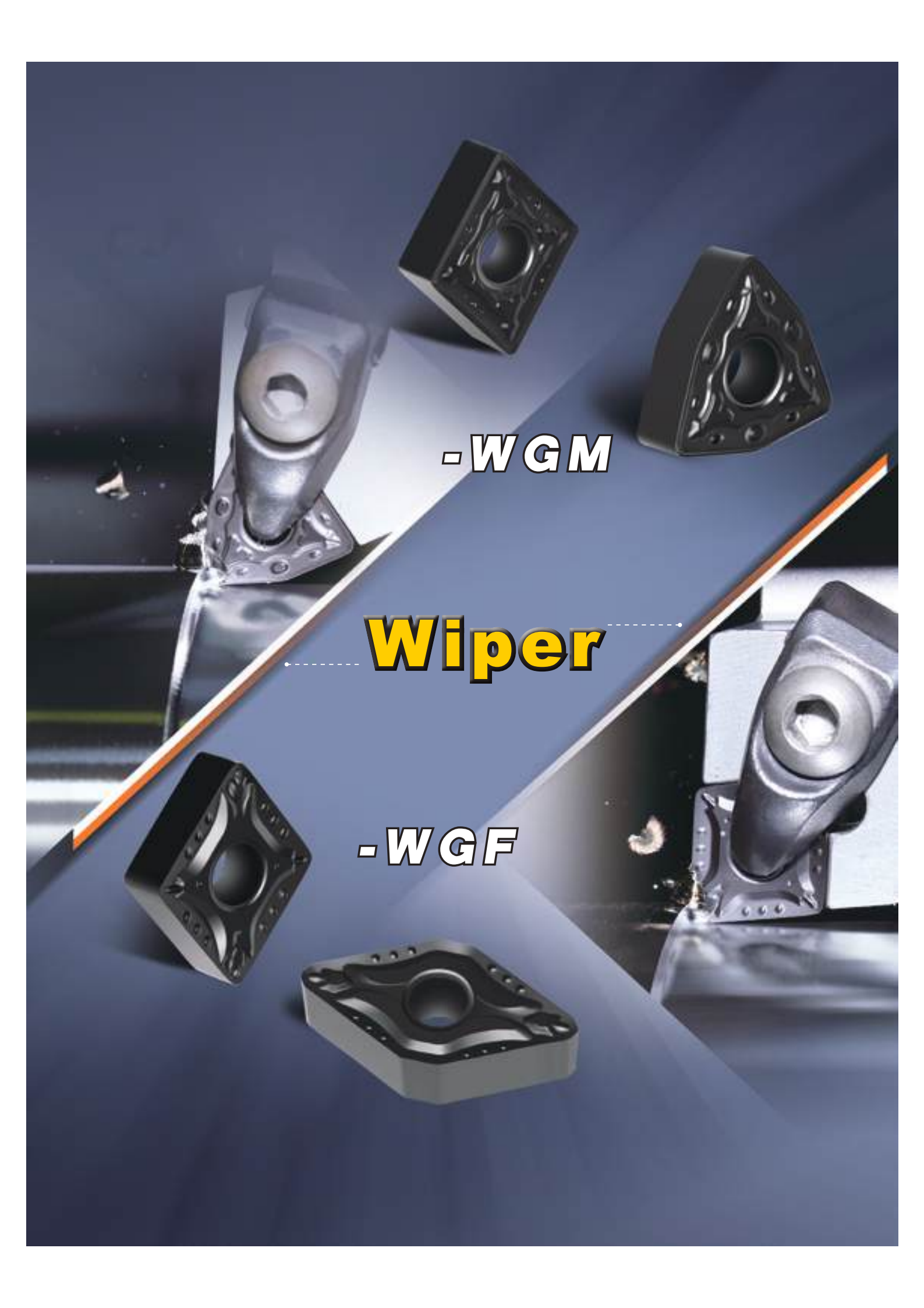


Page	A278-A281	A282-A283	A284	A284	A288	A286	A286
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Threading tools



Page	A313	A314
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The background is a dark blue-grey gradient with a prominent diagonal line running from the bottom-left to the top-right. This line has a thin orange stripe along its upper edge. Various mechanical parts are scattered around: a large, complex metal component with a circular opening is on the left; a square metal block with a central hole and four small circular indentations is at the top; a triangular metal block with a central hole and four small circular indentations is on the right; and two more square metal blocks with similar features are at the bottom. The text is overlaid on this background.

-WGM

Wiper

-WGF



-HPR

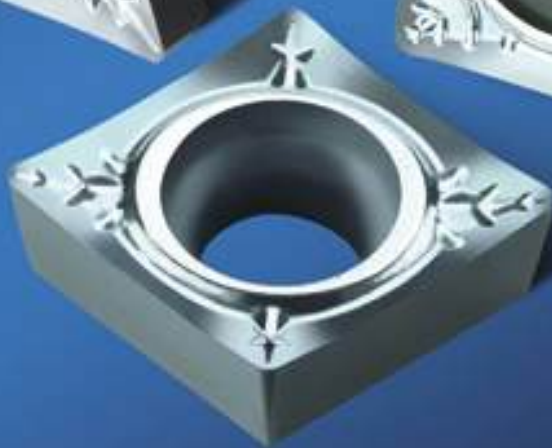
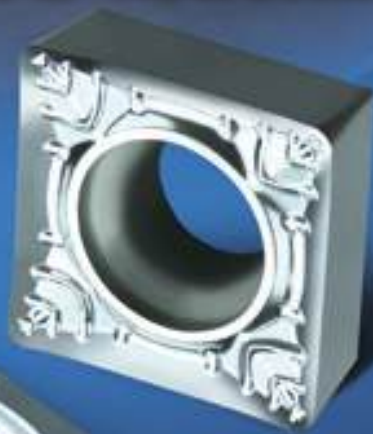
**New Generation of
Roughing Chipbreaker**

-LR





**-LC chipbreaker
for Al machining**





A turning tool with a square insert, labeled YBM215, is shown in the process of machining a metal workpiece. The tool is positioned at an angle, and the workpiece is being turned, creating a smooth, cylindrical surface. The background is a solid blue color.

YBM215

Outstanding wear resistance, extends the tool life
achieves high efficient processing

**Grade for stainless
steel machining**



A turning tool with a square insert, labeled YBM153, is shown in the process of machining a metal workpiece. The tool is positioned at an angle, and the workpiece is being turned, creating a smooth, cylindrical surface. The background is a solid blue color.

YBM153

Best choice for cutting stainless steel
with high speed under good working condition



ISO	General turning								Threading	Parting and grooving		
Code	Coating		Cermet	Coated cermet	Ceramic	Cemented carbide	PCBN	PCD	Coating	Coating		Cemented carbide
	CVD	PVD							PVD	CVD	PVD	
P Steel	01											
	10	YBC151										
	20	YBC251							YBG202	YBC151	YBG205	YC10
	30	YBC152							YBG203	YBC251	YBG302	YC40
	40	YBC252										
M Stainless steel	01											
	10	YBM151										
	20	YBM153							YBG202		YBG205	
	30	YBM251							YBG203		YBG302	
	40	YBM253										
K Cast iron	01											
	10	YBD052					BK1011					
	20	YBD102					BK1021		YBG202		YBG205	YD201
	30	YBD152					BK2541		YBG203		YBG302	
	40						BK2511					
N Non ferrous metal	01											
	10					YD101		DN1021	YBG202			YD101
	20							DN0121	YBG203			
	30							DN3021				
	40											
S Heat resistant alloy & Ti alloy	01											
	10		YBS103			YD101	BS1011		YBG202		YBS103	YD101
	20		YBG102				BS2011		YBG203		YBG102	
	30		YBG105				BS3011				YBG105	
	40		YBG212								YBG302	
H Super hard material	01											
	10						BH0121					
	20						BH1020		YBG202			
	30						BH2511		YBG203			
	40						BH2011					
	50						BH3511					

General turning

Recommended overview for turning inserts



TURNING Guide to selecting turning tools

How to select general turning inserts

How to select general turning inserts

Turning inserts list

- Turning inserts listed according to shape
- Sequence of listed inserts
 - ▶ Negative inserts (with hole – without hole)
 - ▶ Positive inserts (with hole – without hole)
- Sequence of listed chipbreaker
 - For finishing – For semi-finishing – For roughing – For heavy cutting – Without chipbreaker – Through chipbreaker

Selecting grade according to workpiece material and working condition

Prior to select grade for insert according to working condition that is suitable for workpiece material

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

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

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

Main category of products

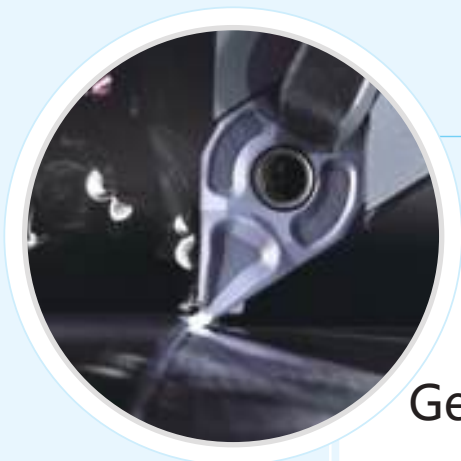
Positive or negative inserts

Shape and dimensions

L: cutting edge length
ØI.C: diameter of inscribed circle
S: Thickness
ød: Hole diameter
r: Nose radius

Type

CN□□ (Negative inserts)		Good working condition										Normal working condition										Bad working condition									



TURNING



General turning inserts

General turning inserts overview • A22-A26

Application instruction of general turning inserts • A27-A49

General turning inserts • A50-A152

General turning inserts code key • A50-A51

Metric-Inch comparison table for general turning inserts • A52-A53

Cemented carbide and cermet inserts • A54-A114

Negative inserts • A54-A88

Positive inserts • A89-A114

PCBN&PCD inserts • A115-A149

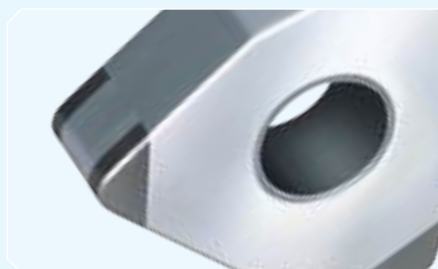
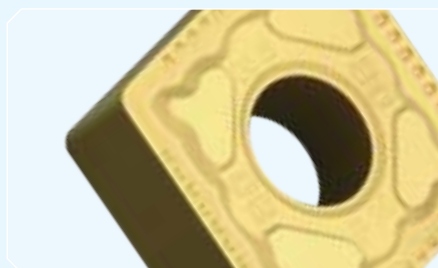
PCBN&PCD inserts code key • A116-A117

PCBN&PCD inserts • A118-A149

Ceramic inserts • A150-A152

Ceramic inserts code key • A150-A151

Ceramic inserts • A152





TURNING General Turning Inserts

General turning inserts overview

General
turning

General turning inserts overview

Negative inserts with hole

Appli- cation	Chipbreaker	Preci- sion	Recommended cutting parameters	Chipbreaker profile	Feature/Shape of insert
For finishing	SF	M			Recommended chipbreaker for finishing of P-type materials Double-sided chipbreaker with M-level tolerance has outstanding performance in finishing, achieving good surface quality.
	DF				Recommended chipbreaker for finishing of P- type materials Double-sided chipbreaker with M-level tolerance has sharp edges, which can effectively cut off stainless steel and avoid adhering and surface hardening, achieving high surface quality.
	EF	M			Recommended chipbreaker for finishing of M-type materials Double-sided chipbreaker with M-level tolerance can prevent wear and hardening to achieve high machining precision and good surface quality.
	NF	E			Recommended chipbreaker for finishing of S-type materials Double-sided chipbreaker with E-level tolerance can prevent wear and hardening to achieve high machining precision and good surface quality.
	NGF	E			Recommended chipbreaker for finishing of S- materials E-class double side chip breaker with excellent sharp edge.High positioning accuracy, light cutting force.-NGF is recommended chip breaker for S series material general finishing.
	WGF	M			Recommended chipbreaker for finishing of S- materials E-class double side chip breaker with excellent sharp edge.High positioning accuracy, light cutting force.-NGF is recommended chip breaker for S series material general finishing.
For semi-finishing	DM	M			Recommended chipbreaker for semi-finishing of P-type materials Double-sided chipbreaker with M-level tolerance produces small cutting forces and has large chip breaking range, which ensures good performance for machining highly adhesive alloy steel.
	PM				Recommended chipbreaker for semi-finishing of P-type materials Double-sided chipbreaker with M-level tolerance has higher strength of cutting edge than chipbreaker DM. It is suitable for semi-finishing under unstable working conditions as well as machining cast iron with small cutting forces.



Negative inserts with hole

Appli- cation	Chipbreaker	Preci- sion	Recommended cutting parameters	Chipbreaker profile	Feature/Shape of insert
For semi-finishing	NM	M			Recommended chipbreaker for semi-finishing of S-type materials Double-sided chipbreaker with M-class tolerance keeps high precision after inserts are turned, with good capability to prevent wear and hardening to achieve higher machining efficiency than chipbreaker NF.
	EM				Recommended chipbreaker for semi-finishing of M-type materials Double-sided chipbreaker with M-level tolerance can solve the processing problems such as chip breaking and adhering of stainless steel, achieving higher machining efficiency than chipbreaker EF.
	WGM				Wiper chipbreaker for semi-finishing Double-sided chipbreaker with M-level tolerance, semi-finishing chipbreaker with wiper designed, perfect combination of good wiper result and sturdy cutting edge structure, which perfectly meet the requirement of high efficiently and good surface quality.
	All round				From semi-finishing to roughing of P-type, M-type, K-type materials Double-sided chipbreaker with M-level tolerance has good cutting edge strength and wide application.
Light-load roughing	DR Double-side	M			Recommended chipbreaker for light roughing of P-type and K-type materials Double-sided chipbreaker with M-level tolerance is the first choice for light roughing, can achieve high evacuation rate and efficiency of cutting edge.
	LR Single-side				Recommended chipbreaker for light-load roughing of P-type materials Single-sided general chipbreaker with M-level tolerance, has wide chip breaking range and sharp cutting edge is designed with inclined angle, which enables it to cut lightly and easily and control the chipping flow direction. Chip-leaded-stages can reduce the contact area with chips, so that heat can easily be dissipated.
For roughing	ER Single/Double side	M			Recommended chipbreaker for roughing of M-type materials Single / double-sided chipbreaker with M-level tolerance has good capacity of impact-resistance. It is designed to achieve balance between security and sharpness of the cutting edge, and it can achieve high efficiency by preventing the problems of adhering and high cutting heat when roughing stainless steel.



TURNING General Turning Inserts

General turning inserts overview

Negative inserts with hole

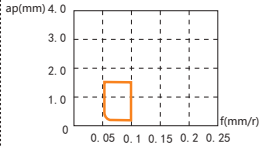
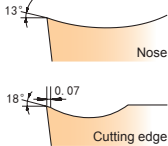
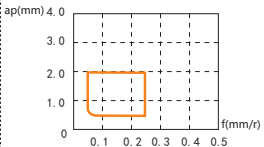
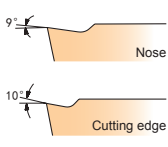
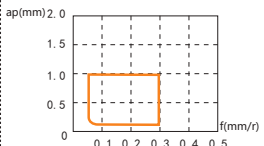
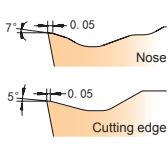
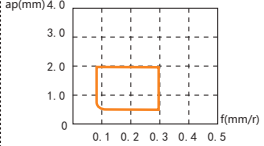
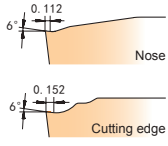
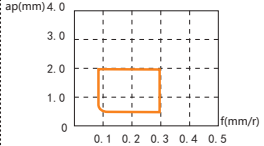
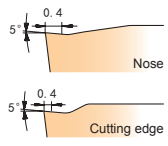
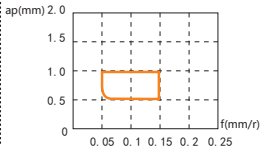
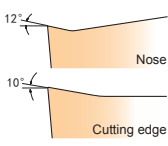
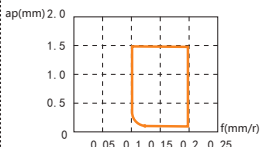
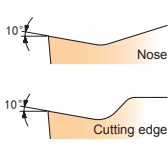
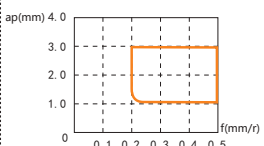
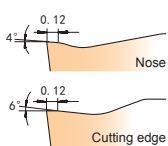
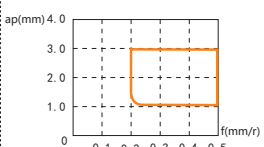
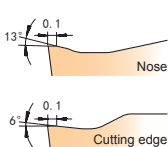
Appli- cation	Chipbreaker	Preci- sion	Recommended cutting parameters	Chipbreaker profile	Feature/Shape of insert
For roughing	DR Single-side	M	ap(mm) 15.0 12.0 9.0 6.0 3.0 0 0.2 0.4 0.6 0.8 1.0 f(mm/r)	5° 0.1 Nose 5° 0.1 Cutting edge	Recommended chipbreaker for roughing of P-type materials Single-sided chipbreaker with M-level tolerance has high security of cutting edge, which can achieve high feed rate and low cutting forces at great cutting depth and high feed rate.
	SNR		ap(mm) 4.0 3.0 2.0 1.0 0 0.05 0.1 0.15 0.2 0.25 f(mm/r)	15° 0.23 Nose 8° 0.23 Cutting edge	Recommended chipbreaker for S-material high efficiency roughing M-level double-sided chipbreaker perfectly combines sharpness and strength of the cutting edge, with small cutting resistance and high edge strength can effectively reduce groove wear. SNR is recommended chipbreaker for high depth roughing of S- materials.
Heavy-load machining	HDR Single-side	M	ap(mm) 15.0 12.0 9.0 6.0 3.0 0 0.2 0.4 0.6 0.8 1.0 f(mm/r)	21° 3.48 Nose 21° 2.15 0.35 Cutting edge	Recommended chipbreaker for heavy lad machining of P materials M level single-sided chip breaker with strengthen cutting edges, high safety and excellent plastic deformation resistance under high metal removal rate.
	HPR Single-side		ap(mm) 15.0 12.0 9.0 6.0 3.0 0 0.3 0.6 0.9 1.2 1.5 f(mm/r)	11° 0.46 0.24 Nose 11° 0.46 0.24 Cutting edge	Recommended chipbreaker for heavy-load machining of P-type materials Single-sided chipbreaker with M-level tolerance, strong cutting edge. Multi-stages chipbreaker ensures the flowing of chip and heat dissipation of insert. It is suitable for machining under unstable and relatively bad working condition, especially for external roughing of work piece with a rough oxidized surfaces.
Cast iron machining	Without chipbreaker	M	ap(mm) 8.0 6.0 4.0 2.0 0 0.2 0.4 0.6 0.8 f(mm/r)		For cast iron machining Double-sided chipbreaker with M-level tolerance has high cutting edge strength. It can overcome inferior factors such as interruption and vibration, etc. when machining cast iron.
Super hard inserts	Without chipbreaker	G	ap(mm) 2.0 1.5 1.0 0.5 0 0.1 0.2 0.3 0.4 0.5 f(mm/r)		For machining of non-ferrous metal and high-hardness metal G-level tolerance is the best choice for machining non-ferrous metals and high-hardness material by welding PCBN and PCD material to cemented carbide substrate.
Ceramic inserts	Without chipbreaker	G	ap(mm) 4.0 3.0 2.0 1.0 0 0.1 0.2 0.3 0.4 0.5 f(mm/r)	0.2 	For roughing of K-, H- high-temperature alloy roughing Sialon Ceramics, V-positioning, solution for high-speed machining of cast iron, hardened steel and superalloy.

General
turning

General turning inserts overview



Positive inserts with hole

Applica- tion	Chipbreaker	Preci- sion	Recommended cutting parameters	Chipbreaker profile	Feature/Shape of insert
For extra finishing	USF 	G			Precision turning chipbreaker With G-level tolerance, large rake angle, sharp cutting edge, for soft cutting action, this is the first choice for precision turning of small shaft parts. 
	R/L 	G			Recommended chipbreaker for precise boring inserts With G-level tolerance, sharp cutting edge and small nose radius, it can effectively reduce the vibration in machining and is suitable for boring and external turning. 
	SF 	G			First choice for finishing with high requirements on chipbreaker With G-level tolerance, it is the first choice for precise finishing due to its excellent performance on chip breaking. 
For finishing	HF 	M			Chipbreaker for finishing with wide application With M-level tolerance, it is suitable for internal and external finishing of various materials such as steel and cast iron. 
	EF 	M			Recommended chipbreaker for finishing of M-type materials With M-level tolerance, it has sharp cutting edges and is suitable for cutting adhesive materials such as stainless steel, soft steel, etc. 
	NF 	E G			Recommended chipbreaker for finishing S-type materials With E and G-level tolerance and sharp cutting edges, it is suitable for internal and external finishing of high-temperature alloy materials. 
	NGF 	E G			Recommended chipbreaker for S-material general finishing E, G grade accuracy, for inner hole finishing of S materials. 
For semi-finishing	HM 	M			Chipbreaker for semi-finishing with wide application With M-level tolerance, it is suitable for internal and external semi-finishing of materials like steel, cast iron, etc. 
	EM 	M			Recommended chipbreaker for semi-finishing of M-Type materials With M-level tolerance, it has higher hardness of cutting edge than EF and can achieve higher efficiency. 



TURNING / General Turning Inserts

General turning inserts overview

General
turning

General turning inserts overview

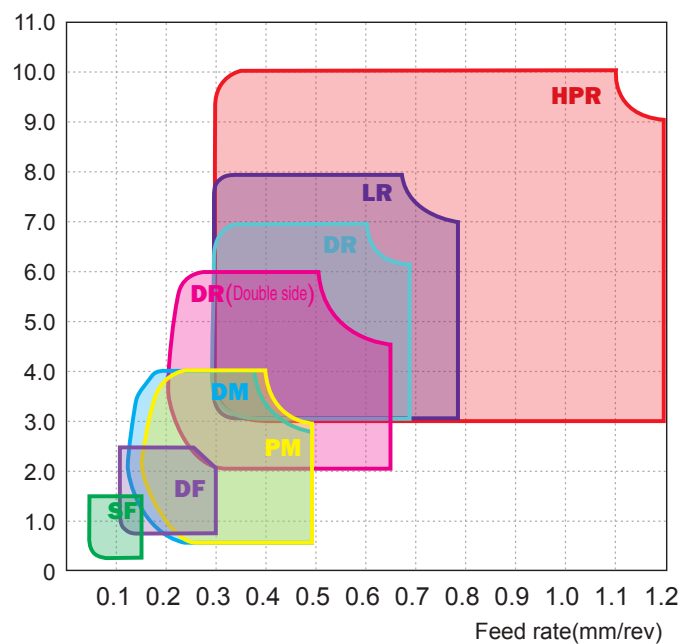
Positive inserts with hole

Applica- tion	Chipbreaker	Preci- sion	Recommended cutting parameters	Chipbreaker profile	Feature/Shape of insert
For semi-finishing	All round	M			Recommended chipbreaker for semi-finishing of M-type materials With M-level tolerance, it is suitable for profile machining materials like steel, cast iron, etc.
	Without chipbreaker	M G			Chipbreaker for machining of cast iron With M- and G- level tolerance, it has high cutting edge strength and is suitable for internal and external machining of cast iron.
For roughing	HR	M			General chipbreaker for roughing With M-level tolerance, it is suitable for both internal and external roughing of materials such as steel, stainless steel, cast iron, etc.
	Special chipbreaker	M			Recommended chipbreaker for heavy machining of P-type materials Single-sided with M-level tolerance, it has good cutting edge strength with high security. It is the first choice for profile roughing.
	SNR	M			Recommended chipbreaker for S-material high-efficiency roughing M-level accuracy, for inner hole roughing of S materials.
For Al machining	LC	G			Chipbreaker for machining of Al alloy With G-level tolerance, large rake angle and clearance angle make the cutting edge sharper, ensuring easy and fast cutting while remaining effective chip breaking.
	LH	G			Special chipbreaker for machining of Al alloy With G-level tolerance, large rake angle and polishing treatment on surface, it can effectively prevent built-up edge and achieve high workpiece surface quality while maintaining long life.
Super hard inserts	Without chipbreaker	G			Special chipbreaker for non-ferrous metals and materials with high hardness With G-level tolerance, it is the best choice for machining of non-ferrous metals and materials with high-hardness by welding PCBN and PCD material to cemented carbide substrate.

Chip breaking range reference for general turning inserts

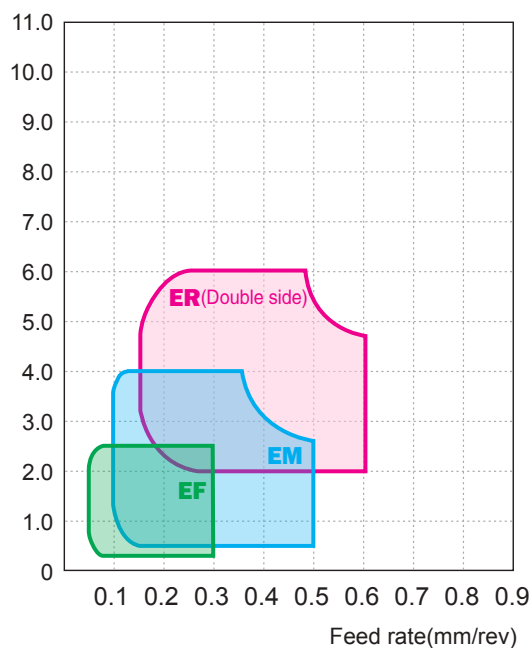
Negative inserts

Cutting depth(mm)



▶ Workpiece material: 45# steel

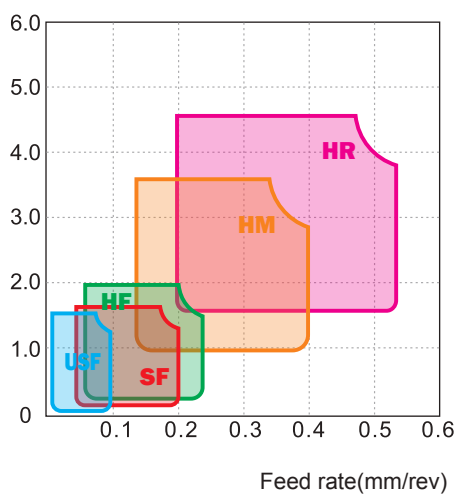
Cutting depth(mm)



▶ Workpiece material: stainless steel (1Cr18Ni9Ti)

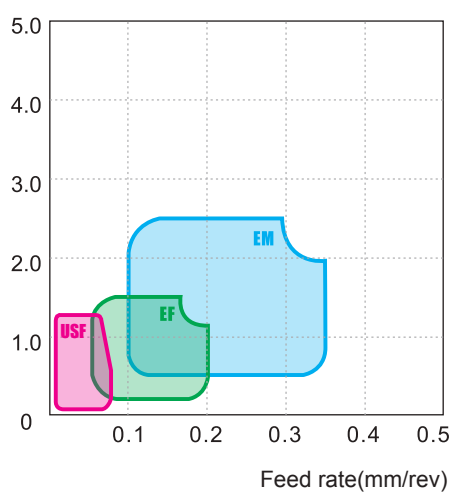
Positive inserts

Cutting depth(mm)



▶ Workpiece material: 45# steel

Cutting depth(mm)



▶ Workpiece material: stainless steel (1Cr18Ni9Ti)



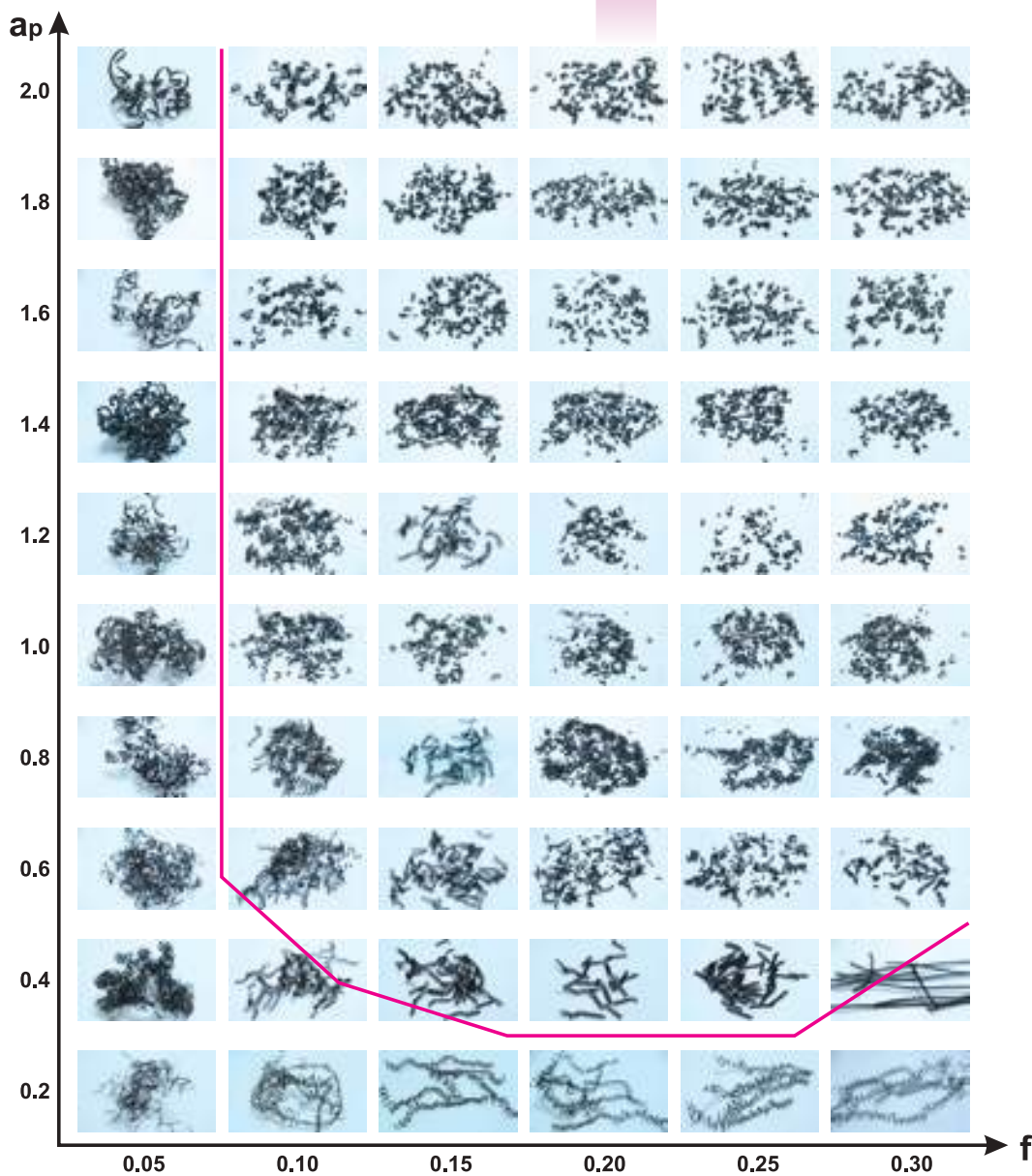
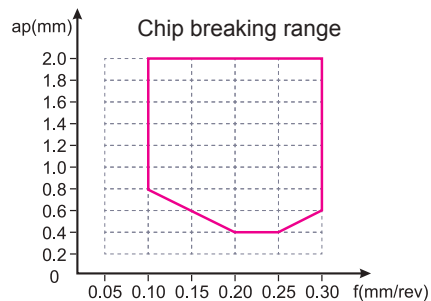
TURNING General Turning Inserts

Application instruction for general turning tools

Cutting test for chip breaking range of general turning inserts

Case

Insert: CNMG120408-DF
Toolholder: PCLNL2525M12
Workpiece material: 45# steel
Cutting speed: 200m/min



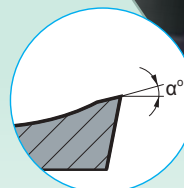
General turning

Application instruction for general turning tools

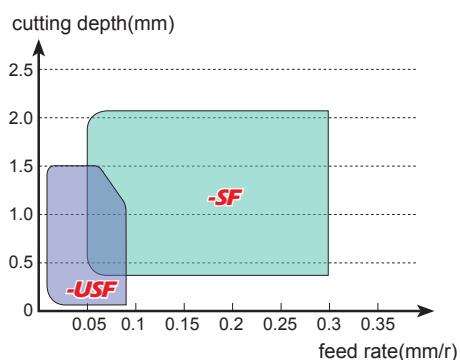
-USF

Precision turning chipbreaker

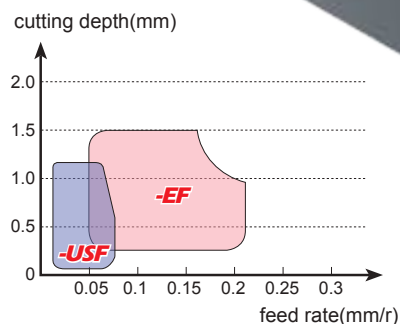
- Effective chip control due to the proper chipbreaker.
- Large rake angle makes cutting easier and faster.
- Nose radius precision controlled within 0.02mm for excellent machining precision.
- Special surface after-treatment for better surface quality.
- High strength screw clamping ensures good repeatability and accuracy.



Application range of USF chipbreaker



Workpiece material: 42CrMo



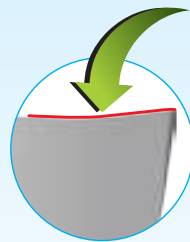
Workpiece material: 1Cr18Ni9Ti

-LC

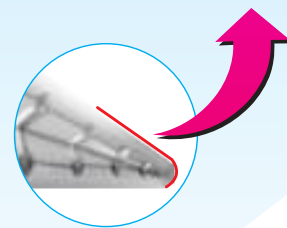
chipbreaker for aluminum

- LC inserts are designed with a special chipbreaker. Large rake angle and clearance angle make the cutting edge sharper, ensuring easier cutting while remaining effective chip breaking.
- Achieved the mirror rake face after special treatment. Reduced the friction resistance, and stick free. Accordingly, make the chip removal fluently and improve the surface quality and tool life.
- The G-class tolerance of insert, higher Repeated Position Accuracy, at the same time, it can effectively avoid the vibration during the machining process.

Optimized inclined angel makes controlling the chipping flow direction valid.

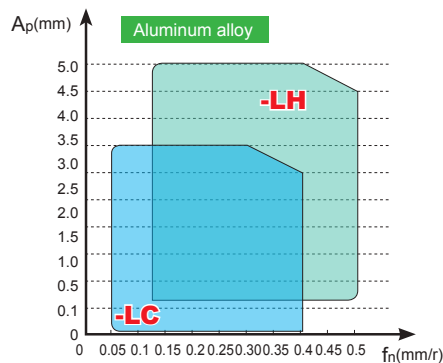
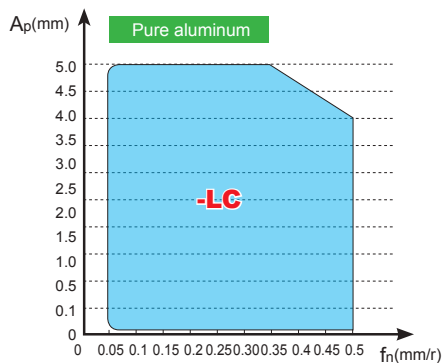


Smooth connection of insert nose and cutting edge makes rake face smoother.



-LC and -LH chipbreaker characteristics and machining range

- LC chipbreaker can be used in machining of pure Al, while -LH chipbreaker can not.
- LC chipbreaker expand the chip breaking range of Al alloy machining.

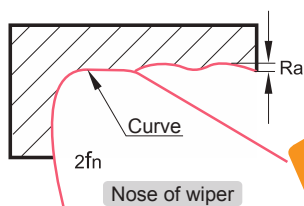


Workpiece material: Pure aluminum

Cutting parameters	V=350m/min $A_p=0.2$ mm F=0.2mm/r	
Chips		
Surface quality		
	-LC chipbreaker	similar products from overseas manufacturers
	■ -LH chipbreaker is more suitable for machining aluminum alloy in condition of large cutting depth and high feed rate. ■ -LC chipbreaker is more suitable for machining aluminum alloy in condition of small cutting depth and low feed rate. ■ -LC chipbreaker can be used in machining pure aluminum.	

-WGF/WGM

chipbreaker series Turning inserts with wiper



High efficiency

Roughness remains the same when feed rate is doubled.



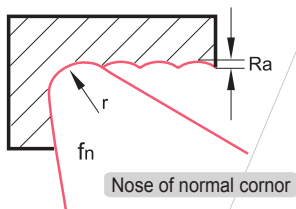
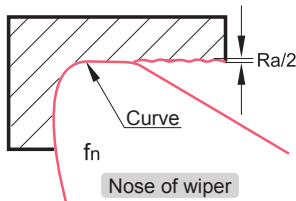
Wiper is assembled by three curves to form a circular arc edge. The nose of wiper provides less profile height on the surface that is formed by the cutting edge, resulting in a smooth turning surface.

Inserts with wiper has high efficiency when used for finish and semi-finish turning. The surface quality remains the same even at double feed rate.

Wiper technique =
high machining efficiency + high surface quality

High quality

Roughness value is reduced to half when feed rate remains the same.



When used for finishing, it can improve roughness of workpiece surface and achieve turning instead of grinding.

When used for semi-finishing, efficiency could be improved by doubling the feed rate, the roughness of workpiece surface remaining the same.

Guide to use

●Select reasonable approach angle of the tools

Minor angle being close to 0 degree is the reason that inserts with wiper can reduce roughness of the surface, which is determined by the shape of insert and approach angle of the tool holder. Therefore, acceptable roughness of surface is the result of reasonable approach (minor) angle. The finishing function of wiper would be reduced or invalid if unreasonable approach (minor) angle is chosen. For example, the approach angle should be 95° for CNMG / WNMG inserts, while 93° is the best for DNMX.TNMX inserts.

●Be careful with DNMX / TNMX inserts

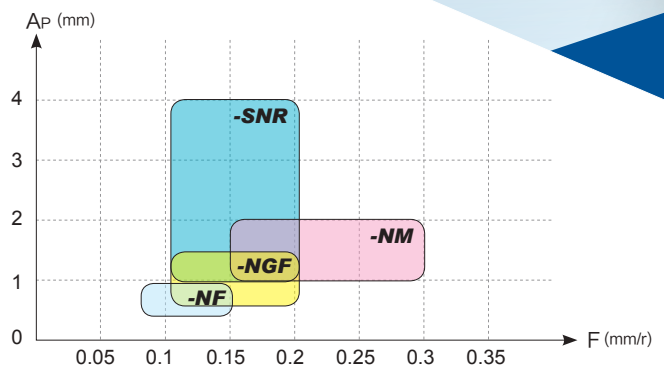
DNMX / TNMX inserts with wiper don't have wide application. It cannot achieve a wiper result when minor angle is not 0 degree, like chamfer and profile surface, and will even cause over-cutting or no-cutting on workpiece, affecting the shape and size precision of workpiece. Please contact technical service regarding these problems.

S- Ni-based Superalloy Machining Difficulties Overcame

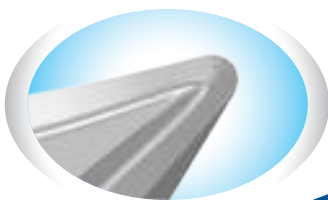
Features of Ni-based superalloy machining

- High cutting resistance (containing a large amount of alloying elements, severe hardening, great plastic deformation ;
- High cutting temperature;
- Severe wear of inserts.

Chipbreaker for machining of Ni-based superalloy should have tough and sharp insert nose, smooth rake face and proper inclination angle.



-NM for semi-finishing -SNR for high efficiency roughing
-NF for finishing -NGF for general finishing



-SNR Chipbreaker for roughing with large depth of cut

- Positive rake angle design, sharp cutting edge, low cutting resistance, effectively reducing groove wear;
- Cutting edge with variable rake angles increase cutting edge strength at large depths of cut. Edge strength increases as the depth of cut increases;
- Large slot width combined with unique edge rib design not only provides excellent chip breaking performance but also can effectively improve edge strength.



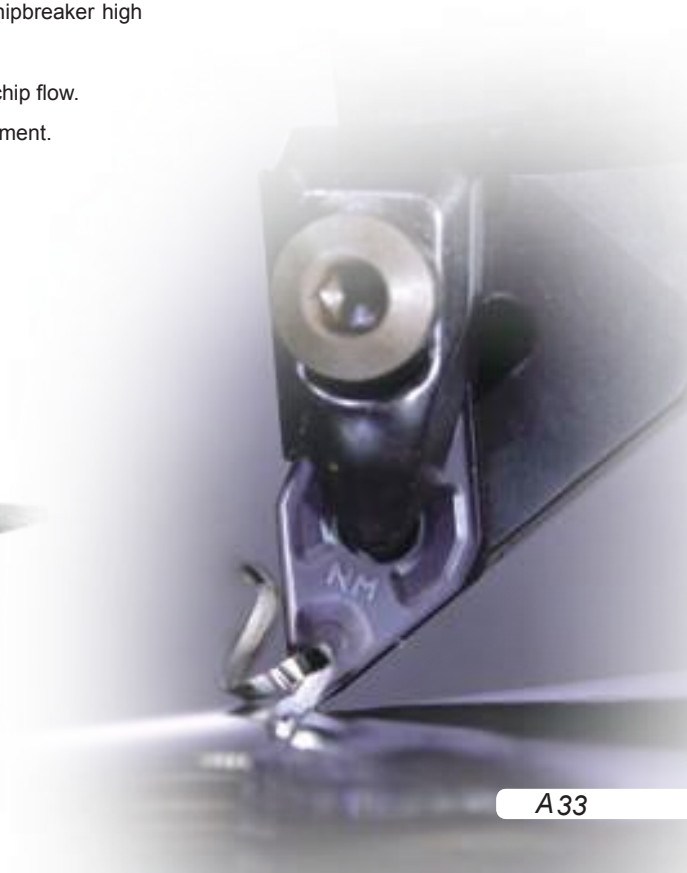
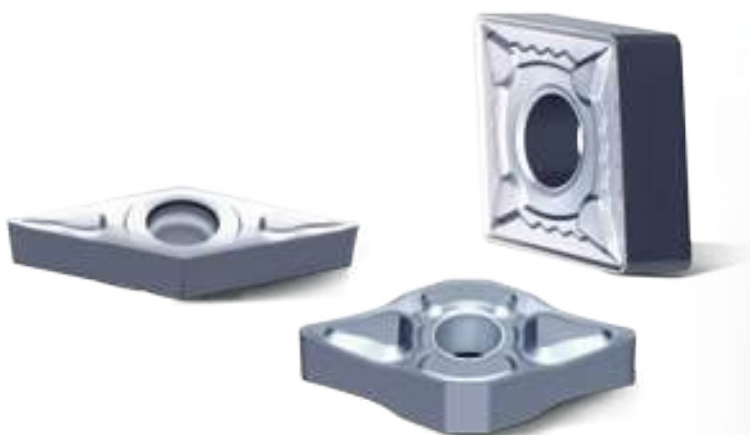
-NGF Chipbreaker for General Finishing

- Proper inclination angle design, sharp cutting edge, small cutting resistance;
- E-level tolerance of insert, high clamping accuracy, proper chipbreaker width, good chip breaking performance, excellent surface quality;
- Special edge treatment, high wear resistance.



-NFINM Chipbreaker for General Finishing

- -NF chipbreaker has sharp cutting edge, while -NM chipbreaker high cutting edge strength.
- Smooth surface of chipbreaker ensures unobstructed chip flow.
- High wear resistance of cutting edge after special treatment.



-EF -EM -ER

Specially designed for machining intensively adhesive and high-plasticity materials such as stainless steel, etc

-EF

Rake angle and inclined angle are specially designed for intensively adhesive stainless steel and high-plasticity materials which are hard to be machined. Sharp cutting edge enables it to cut lightly and easily and achieve good surface quality by well controlling chip breaking. It is especially suitable for finishing these kinds of materials.

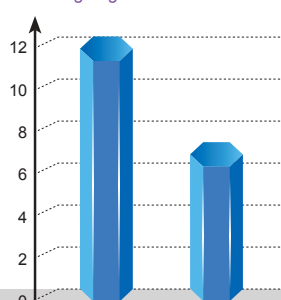
-EM

Inserts meet the requirements of machining intensively adhesive materials. Impact resistance of cutting edge is improved in addition to sharpness, which makes it suitable for semi-finishing and intermittent machining of adhesive materials such as austenitic stainless steel, etc.

-ER

Specially designed double rake angle with wide land achieves balance between edge security and sharpness, and effectively reduces cutting resistance and wear on groove.

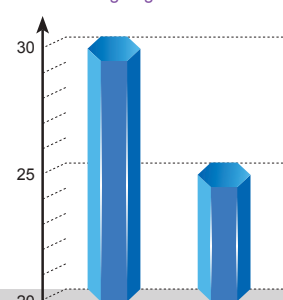
Number of machined parts / Cutting edge



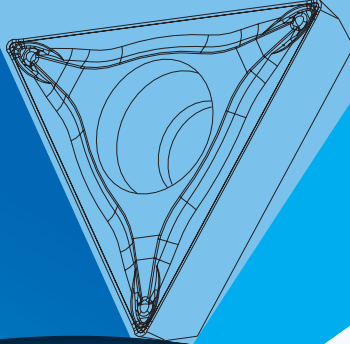
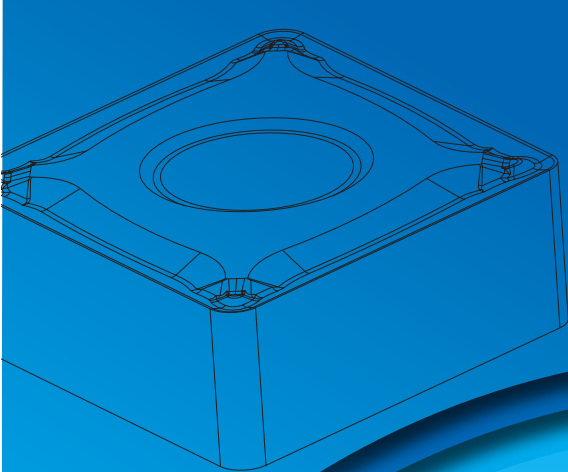
Machining external of valve

Machining end surface of valve (intermittent machining)
Workpiece diameter: 135mm
Rotating speed: 350rpm
Feed rate: 0.25mm/r
Cutting depth: 1.5mm

Number of machined parts / Cutting edge



Machining external of valve
Workpiece diameter: 89mm
Rotating speed: 635rpm
Feed rate: 0.15mm/r
Cutting depth: 1.0mm



-SF Chipbreaker for finishing

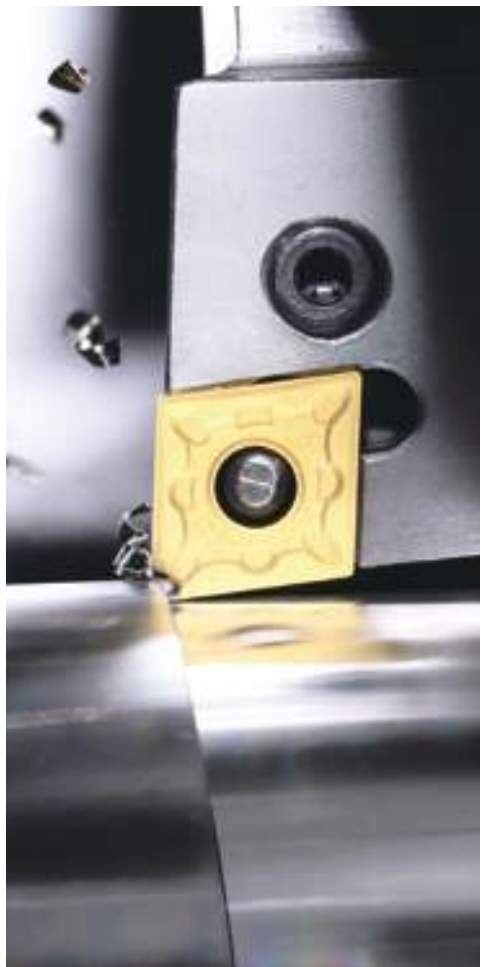
Unique nose design and sharp cutting edge lead to small cutting resistance and effectively reduce vibration of the tool holder.

With high re-positioning precision, the insert is compatible with specially developed cemented carbide tool holders, which can increase the capability of vibration resistance and improve machining quality.

Special treatment on insert's surface can reduce the possibility of chips adhering to the rake face of insert. Good performance of chip breaking and chip flowing ensures improved surface quality of workpiece.

By adopting excellent grade, it is suitable for extra finishing of various materials.





YBC151

The combination of substrate with excellent wear resistance and coating composed of MT-TiCN, thick layer of Al₂O₃ and TiN makes it suitable for finishing steel.

YBC251

The substrate with good toughness and high security of cutting edge, in optimal combination with coating composed of MT-TiCN, thick layer of Al₂O₃ and TiN makes it suitable for steel semi-finishing.

YBC351

The best combination of substrate with high wear resistance and coating composed of MT-Ti (CN), thick Al₂O₃ layer and TiN makes it suitable for finishing and semi-finishing of cast iron materials.

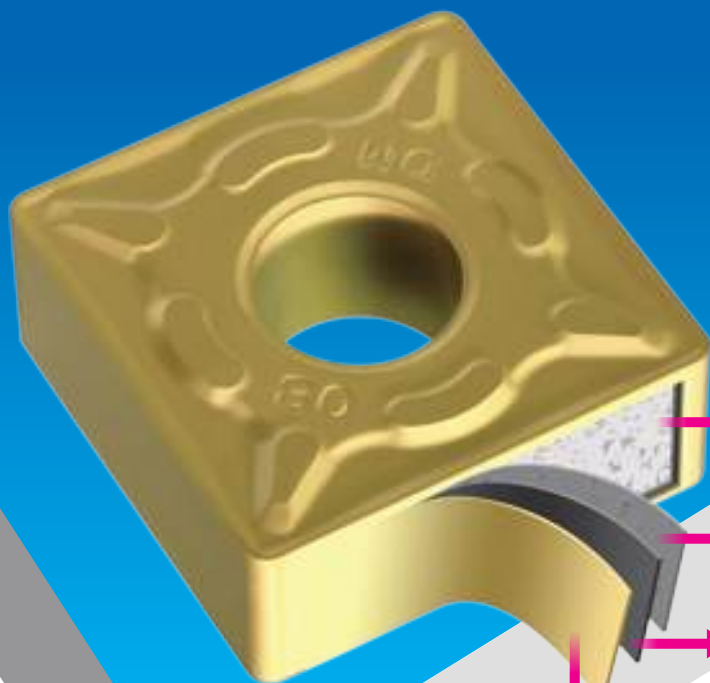
YBM151

Substrate with special structure, in combination with coating composed of TiCN, thin Al₂O₃ layer and TiN, with excellent resistance against diffusive wear and plastic deformation makes it suitable for finishing, semi-finishing and roughing of stainless steel.

YBM251

Combination of substrate with good toughness and strength and coating composed of TiCN, thin Al₂O₃ layer and TiN makes it suitable for semi-finishing and roughing of stainless steel.

Coated Cemented Carbide CVD



YBC251 Coating

Thanks to the technology of gradient sintering, impact resistance of cutting edge and wear resistance are improved which lead to improved capability of cutting edge against damage.

Carbide with special crystal structure improves the Red Hardness of substrate and strengthens heat resistance of insert.

TiCN layer acts against abrasion, which leads to the best wear resistance of the flank.

Special structure of Al₂O₃ deposit layer acts as a thermal barrier and strengthens the capability of substrate against plastic deformation under dry and high-speed cutting conditions.

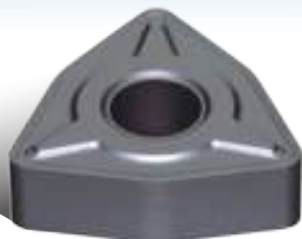
Golden surface of TiN can reduce friction and enable easy distinction of the variety of wear.

BLACK DIAMOND INSERTS

Innovation of machining techniques for stainless steel turning



YBM153



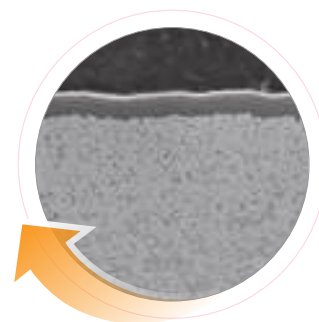
Best choice for roughing of stainless steel with high-speed under good working condition

Coating

- ✓ CVD coating with advanced ultra-fine grain coating technology, greatly improves wear resistance of inserts.
- ✓ Thanks to special treatment on transition layer, multi-layer coating are combined firmly.
- ✓ The exceptionally smooth coating surface and good low friction ability can reduce the occurrence of built-up edges.

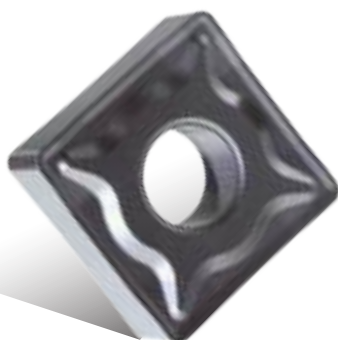
Substrate

- ✓ Added with resist high temperature rare element, inserts shows a good capability against plastic deformation and good capability of Red Hardness.
- ✓ Unique manufacturing technology improves high temperature toughness and wear resistance of substrate.



Application fields YBM153 is suitable for finishing and semi-finishing of stainless steel with high cutting efficiency under stable working condition. Such as medium-size fluid valve components in petrochemical industry, flange and other parts in auto pipeline, valve and valve body in auto engine systems, ship mechanical parts, aviation hydraulic parts, adapting pieces in IT and semiconductor industry, medium and long-axis in food processing machinery, construction machinery and general machinery.

YBM253



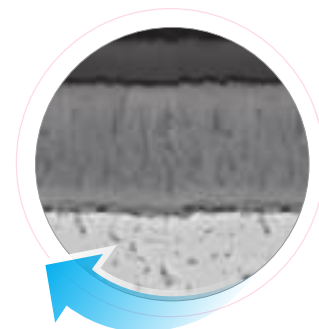
Ideal grade for turning of stainless steel with high cutting depth and high feed rate under bad working condition

Coating

- ✓ Ultra-fine grain coating technology provides better wear resistance and toughness;
- ✓ Improved remain internal stress design ensures good toughness and anti-cracking performance;
- ✓ Polishing treatment on coating surface makes it suitable for cutting adhesive materials.

Substrate

- ✓ With gradient carbide substrate insert has better impact resistance and cutting edge strength.



Application fields YBM253 grade is suitable for roughing of heavy stainless steel parts with high cutting depth and high feed rate under the condition with great impact.



Coated Cemented Carbide CVD

BLACK DIAMOND INSERTS

**Achieving both higher cutting
speed and longer tool life**

Second generation of



Coated Cemented Carbide CVD

YBC152

Thick TiCN and thick Al₂O₃ coatings improve the impact toughness and abrasion resistance, which makes it suitable for finishing and semi-finishing of steel at high speed. Cutting speed can increase by more than 25%, while the tool life can increase by more than 30% at the same cutting speed.

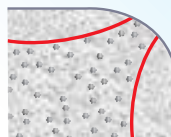
YBC252

Comprising of thick TiCN and thick Al₂O₃ coatings, the grade has high capability against plastic deformation and good hardness of cutting edge. It is preferred grade for machining of steel from finishing to roughing. Under the same cutting conditions, the cutting speed can be increased by more than 25%, while the tool life can be 30% longer under the same cutting speed.

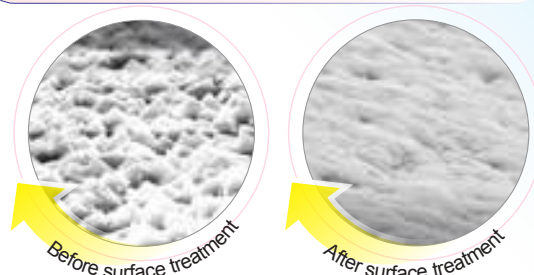
YBC352

Thickness TiCN and Al₂O₃ coating, with strongest toughness and plastic deformation resistance, the ideal grade for high efficient steel rough machining under the bad condition.

Perfect unification of toughness and anti-plastic deformation. Specially designed cutting edge with "skeleton" realizes perfect unification of toughness and anti-plastic deformation.



Roughness of insert surface is improved after special treatment on surface, which effectively reduces cutting forces, prevents workpiece adhering to surface of inserts and improves operation stability of inserts.



The perfect combination of fibrous TiCN and fine grain Al₂O₃ obviously improves abrasion resistance and anti-breakage of inserts.

Test comparison of inserts abrasion

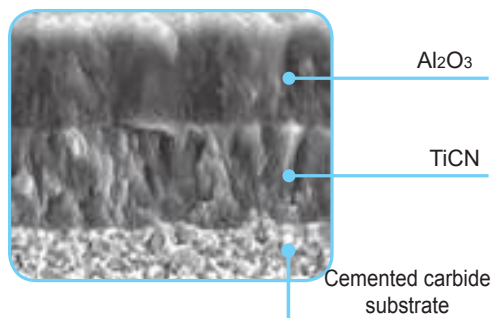
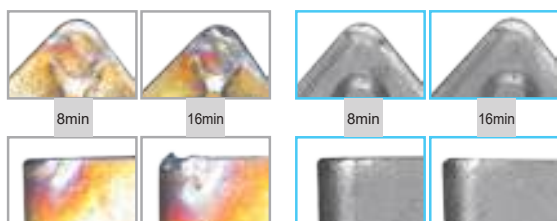
Workpiece material : 45# steel

Inserts: CNMG120408-DM

Cutting parameters: Vc=400m/min ap=1mm fn=0.2mm/r

Grade from other company

YBC152



YBD052

CVD coated grade, which is characterized by super fine grain and smooth surface, is the combination of hard substrate and coating (extra thick Al_2O_3 + thick TiCN). The grade is optimized for best wear resistance when machining gray cast iron at high speed under dry condition.

YBD102

CVD coated grade, which is the combination of hard substrate and coating (thick Al_2O_3 + thick TiCN), shows excellent wear resistance and impact resistance when machining nodular cast iron at high speed.

YBD152

CVD coated grade, which is the combination of hard substrate and coating (medium thick Al_2O_3 + thick TiCN), has good flaking resistance. It is suitable for turning of cast iron at high speed, and light intermittent cutting can be supported even at moderate speed. It is also suitable for milling of cast iron.

YBD252

CVD coated grade, which is the combination of hard substrate and coating (medium thick Al_2O_3 + thick TiCN), achieves the balance between wear resistance and toughness. It is suitable for wet milling of cast iron, which requires toughness (such as nodular cast iron) at moderate or low speed. It is also suitable for intermittent turning.

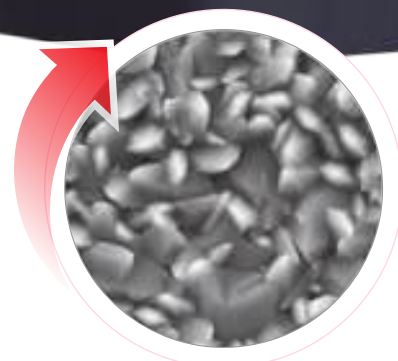
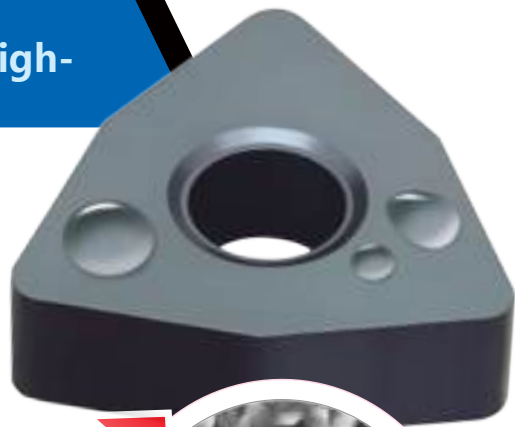
BLACK DIAMOND INSERTS YBD

First choice for high-efficiency and high-speed machining of cast iron

- The combination of thick coating and substrate with good hardness and impact resistance gives the inserts excellent impact resistance and stability under high temperature, and improves wear resistance of inserts. Inserts also satisfy the requirements of high speed and high feed rate when machining cast iron.
- The appearance of shining full black is easily identified.

Significant results

- Working efficiency has been improved. Both the coating and the substrate are suitable for machining cast iron at high speed and high feed rate. Cutting speed can be increased by **30% to 40%**.
- Cost is reduced as tool life is increased by **40%-50%**.
- High machining stability.



Layer of fine grain with compact surface

Coated Cemented Carbide CVD

Recommended combination of grade and chipbreaker

For machining of P-type materials

Grade	Type
YBC151	DF
YBC152	DF
YBC251	DM
YBC252	PM
YBC251	DR
YBC252	(Double-side)
YBC351	DR
YBC351	HPR
YBC352	HPR

For machining of M-type materials

Grade	Type
YBM151	EF
YBM151	EM
YBM151	ER
YBM153	EF
YBM153	EM
YBM251	EM
YBM251	ER
YBM253	EM
YBM253	ER

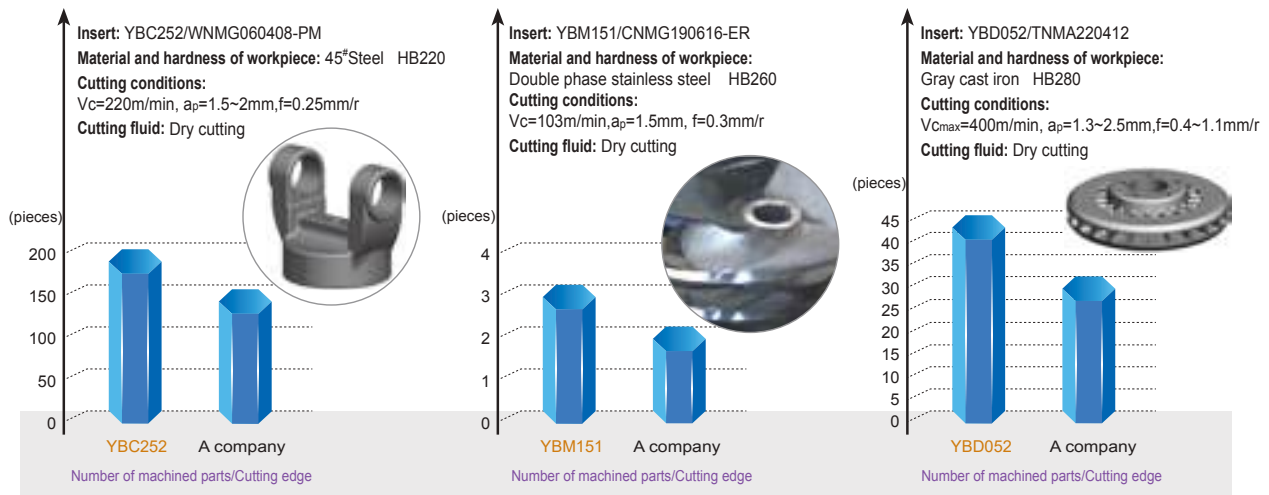
For machining of K-type materials

Grade	Type
YBD052	Without chipbreaker PM
YBD102	Without chipbreaker PM
YBD152	Without chipbreaker
YBD252	Without chipbreaker

Recommended cutting parameters

Workpiece material	Range of machining	Grade	Recommended cutting speed(m/min)
P	For finishing	YBC151	180-460
		YBC152	220-500
	For semi-finishing	YBC251	160-440
		YBC252	180-480
	For roughing	YBC351	130-380
M	For finishing	YBM151	110-280
	For semi-finishing	YBM153	
	For roughing	YBM251	
		YBM253	
K	For finishing	YBD052	200-500
	For semi-finishing	YBD102	200-480
		YBD151	180-450
		YBD152	190-450
Cast iron	For roughing	YBD252	150-380

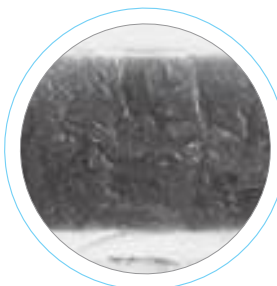
Case



Coated Cemented Carbide **PVD** makes it easy to machine materials which are hard to be machined

New nano coating grade

- Special coating techniques make inserts smooth, which leads to low friction and unobstructed chip flow.
- Unique coating with nano structure closely integrates with substrate, ensuring higher hardness and toughness.
- Excellent thermal stability and chemical stability can effectively protect cutting edge.



nc-TiAlN coating(YBG202)



TiAlN base multi-elements coating (YBG105)

High-performance nanostructure coating guarantees good toughness and hardness of inserts. Special coating technology guarantees smooth surface and excellent wear resistance. Outstanding thermal stability and chemical stability effectively protect cutting edge.

▶ **YBG102**

The combination of nc-TiAlN coating and fine grain substrate makes it suitable for turning of various materials and finishing and semi-finishing of high-temperature alloys.

▶ **YBG202**

nc-TiAlN coating and ultra-fine grain substrate makes it suitable for finishing and semi-finishing of various materials and turning of super alloy.

▶ **YBG302**

The combination of nc-TiAlN coating and tough cemented carbide substrate, which integrates security and wear resistance, makes it suitable for parting and grooving of various materials.

▶ **YBG105**

Finishing and semi-finishing for materials difficult to cut
PVD coated grade

PVD coated grade, new TiAlN based multilayer coating, has higher wear resistance and Anti-thermal-oxidation ability. It is suitable for finishing and semi-finishing turning of various materials difficult to cut, such as high temperature alloy, heat resistant alloy, etc.

▶ **YBG205**

PVD coating grade for finishing of stainless steel

Suitable for relatively small workpieces which require high surface smoothness.

Superfine TiAlN nano coating added with wear-resistant and heat-resistant rare elements has high hardness and excellent heat-resistance, providing effective protection for the cutting edge. Special coating technology ensures stronger combination of coating and substrate. It is suitable for extra finishing of stainless steel.

▶ **YBG212**

Nc-TiAlN coating combined with super tough substrate which made of super fine grain. It's suitable for finishing and roughing materials which are hard to be machined.

▶ **YBS103** *New*

Turning grade for Ni-based S material

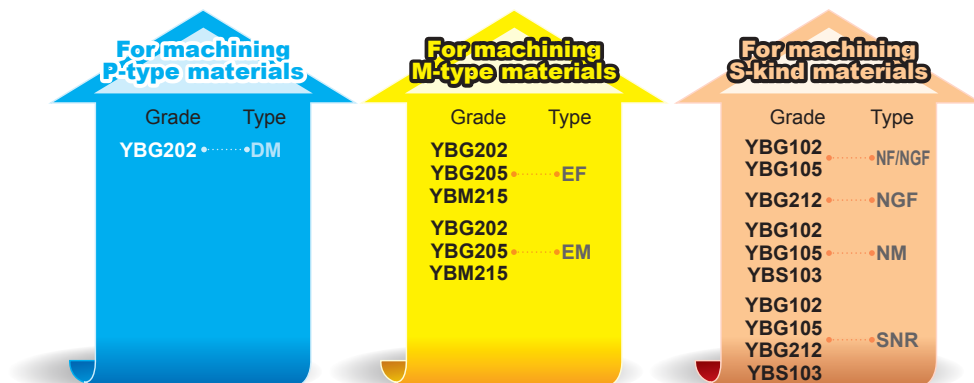
Fine wear resistance, and good capability against built-up edge and heat resistance. Suitable for turning of Ni-based materials.

▶ **YBM215** *New*

PVD coating of multiple layer nanometer

Improved capability of grade's wear resistance and anti-high temperature increases the strength between grade and substrate and the tool stability. This grade is very suitable for turning for stainless steel.

Recommended combination of grade and chipbreaker



Recommended cutting parameters

Workpiece material	Range of machining	Grade	Recommended cutting speed(m/min)
P Steel	For finishing	YBG102	180-460
	For semi-finishing	YBG202 YBG205	150-380
M Stainless steel	For finishing ~ for semi-finishing	YBG202 YBG205 YBM215	170-300
S Heat resistant Alloy Ti alloy	For finishing ~ for semi-finishing	YBG102	30-60
		YBG105	40-70
		YBG212	30-50
		YBS103	40-90
	For roughing	YBG102	20-40
		YBG105	30-40
		YBG212	20-40
		YBS103	20-50

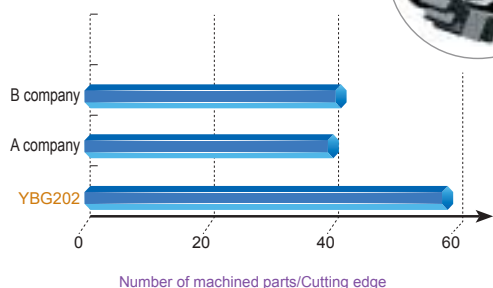
Case

Insert : YBG202/TNMG120404-EF

Hardness and material of workpiece : 0Cr18Ni9 HB240

Cutting conditions : $V_c=200\text{m/min}$, $a_p=1\text{mm}$,
 $f=0.15\text{mm/r}$

Cutting fluid : Dry cutting

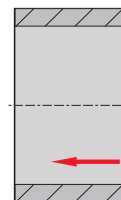
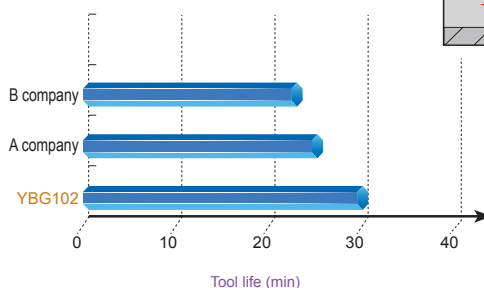


Insert : YBG102/DNEG150404-NF

Hardness and material of workpiece : High temperature alloy Inconel 718 HRC≥39

Cutting conditions : $V_c=80\text{m/min}$, $a_p=0.3\text{mm}$,
 $f=0.15\text{mm/r}$

Cutting fluid : Dry cutting



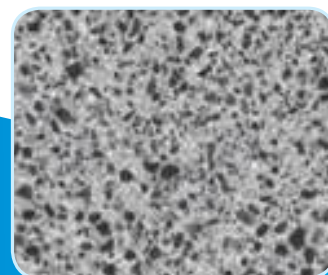
Cermet & Coated Cermet

The chemical stability between Ti(CN) base cermet inserts and workpieces is relatively high, which reduces the friction and temperature of the cutting edge during cutting, preventing mutual diffusion of atoms of the workpiece material and the inserts, and improving resistance to bonding abrasion. Therefore, Ti(CN) base cermet shows good capability of Red Hardness and resistance to crater wear. It is an optimal material for high-speed finishing and semi-finishing of steel. High temperature strength of cermet is higher than that of WC-Co, and toughness better than that of Al_2O_3 and Si_3N_4 ceramic. This fulfils the application blank of WC-base cemented carbide and Al_2O_3 and Si_3N_4 ceramic from finishing to semi-finishing at high speed.

Product features

Scientifically designed structure ensures good material performance and long tool life. Refined production management assures the stability of product quality.

- Symmetrical fine grain organization, together with the control of symmetrical organization and toric phase structure, improves the strength and hardness of cermet.
- Intensified bonding phase and well-designed grain boundary improve the high temperature capacity, heat conductivity and thermal vibration resistance.
- Coating of Physical Vapor Deposition (PVD) is applied to cermet substrate with high toughness, so that the grade has high hardness and toughness with wide-range application.



Substrate of cermet grade of YNG151 (homogenized ultra-fine structure)



PVD coating organization structure of cermet

Recommended cutting parameters

Workpiece material	Range of machining	Grade	Recommended cutting speed(m/min)
 Steel	For finishing	YNG151	260-550
		YNG151C	260-580
 Stainless steel		YNG151	170-330
		YNG151C	160-350
 Cast iron		YNG151	250-400
		YNG151C	270-420

Case

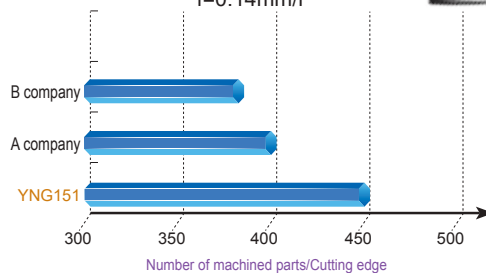
Insert: YNG151/CNMG120404-SF

Hardness and material of workpiece: 20CrMnTi HB180-223

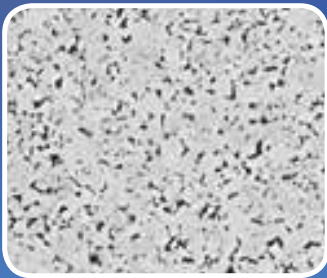
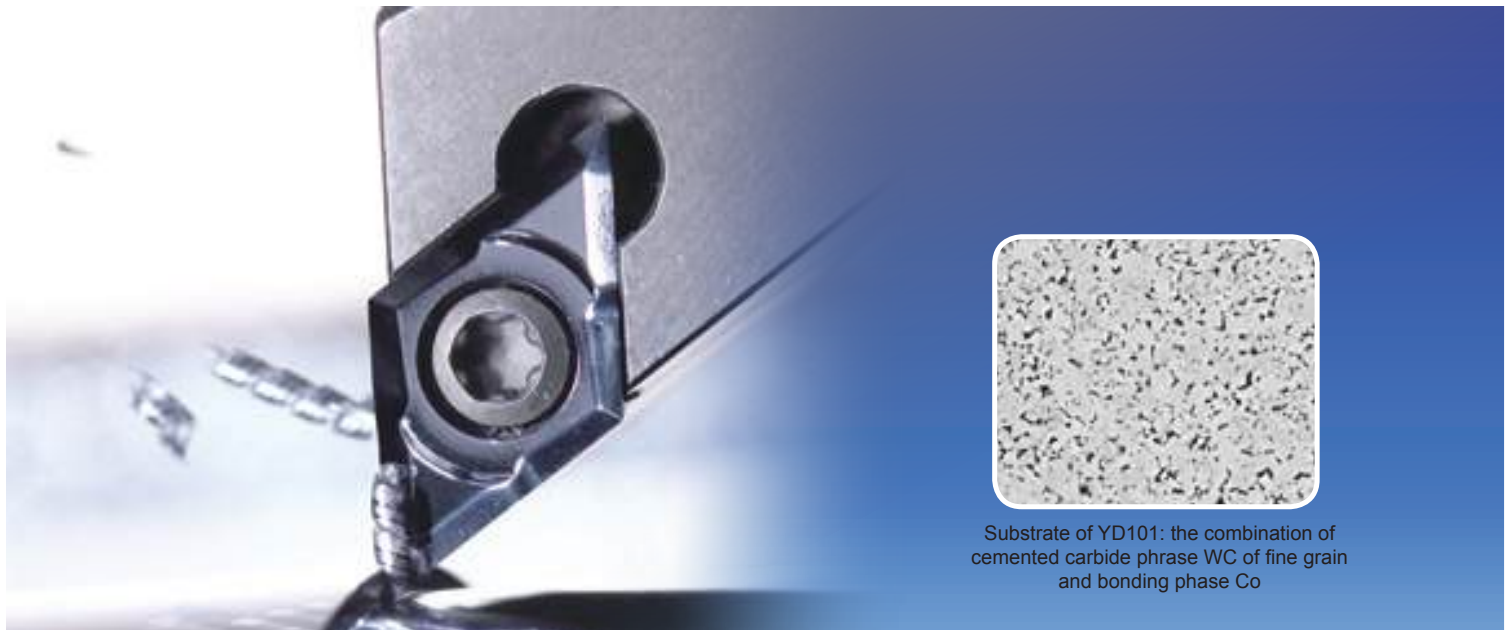
Cutting parameters: $V_c=220\text{m/min}$

$a_p=0.5\sim1.0\text{mm}$

$f=0.14\text{mm/r}$



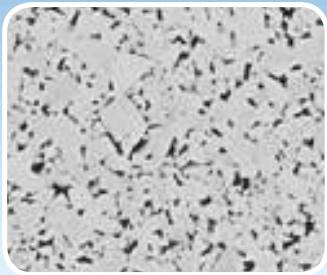
Outstanding chip breaking Good surface quality



Substrate of YD101: the combination of cemented carbide phase WC of fine grain and bonding phase Co

Cemented Carbide Grade

Uncoated cemented carbide grade is widely used for machining of non-ferrous metal, high temperature alloy, etc. It is economical and can be universally applied.



Substrate of YD201: the combination of cemented carbide phase WC of middle grain and bonding phase Co

Recommended cutting parameters

Workpiece material	Range of machining	Grade	Recommended cutting speed(m/min)
K Cast iron	For semi-finishing For roughing	YD201	60-130
N Non-ferrous metal	For finishing For semi-finishing	YD101	110-1750
S Heat resistant Alloy Ti alloy	For finishing	YD101	20-50

Case

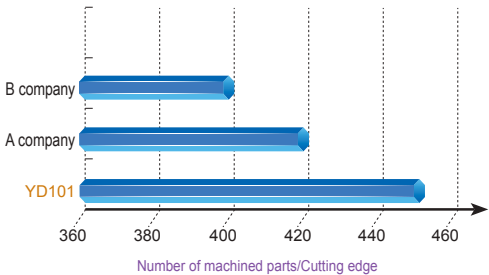
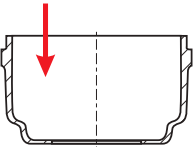
Insert: YD101/CCGX09T304-LH

Workpiece material: ZL105 HB70

Cutting parameters: $V_c=400\text{m/min}$

$a_p=1\text{mm}$

$f=0.3\text{mm/r}$



Workpiece has high surface quality and high dimensional precision.

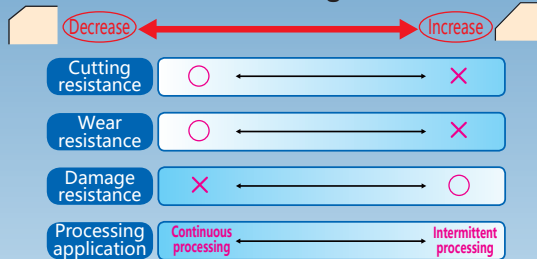
PCBN

PCBN tool material has high hardness, high thermal stability and high chemical inertness, There will be no chemical reaction with iron materials under the high temperature, the cutting temperature can reach 1200-1300°C, Suitable for cutting hardened steel, cast iron, powder metallurgy and high temperature alloys.

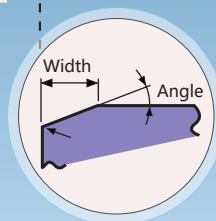


- High hardness and high heat resistance to achieve tool long life and high-speed processing;
- Effectively inhibit crater wear and realize stable processing;
- Improve the stress of the matrix and reduce the micro chipping and spalling of the cutting edge.

Chamfer width and angle



The shape of chamfering



Cutting edge specifications of PCBN inserts

(The form below is just for typical example, the actual application shall be adjusted according to the corresponding situation.)

	Low cutting force	Universal type	Highly damage resistance
High hardness material processing			
Cast iron processing			

Case

Machining cylinder liner

Workpiece material: gray cast iron HT250, HB220
 Insert model: CNGA120416AS01015-2
 Insert grade: BK1011
 Cutting parameters: $V_c=600\text{m/min}$; $f=0.2\text{mm/r}$; $a_p=0.15\text{mm}$
 Processing method: turning outer circle
 Cooling method: wet cutting
 Processing requirements: surface finish $R_a < 1.6\mu\text{m}$ and no dimension deviation.



- Machining life increased by 5 times
- Processing efficiency increased by 1 times

Machining of high-temperature alloy bars

Workpiece material: nickel-based alloy Inconel 718, 43-48HRC
 Insert model: VBGW160404AT01225-2
 Insert grade: BS3011
 Cutting parameters: $V_c=150\text{m/min}$; $f=0.15\text{mm/r}$; $a_p=0.25\text{mm}$
 Processing method: turning outer circle
 Cooling method: dry cutting
 Processing requirements: flank wear $\leq 0.2\text{mm}$



- Machining life increased by 6 times
- Processing efficiency increased by 5 times

Machining differential gears

Workpiece material: carburizing steel 20CrMnTi, HRC58-62
 Insert model: VNGA160404AS01225-2
 Grade: BH0121
 Cutting parameters: $V_c=130\text{m/min}$; $f=0.1\text{mm/r}$; $a_p=0.15\text{mm}$
 Processing method: turning the side of the inner groove
 Cooling method: dry cutting
 Processing requirements: surface finish $R_a < 0.8\mu\text{m}$



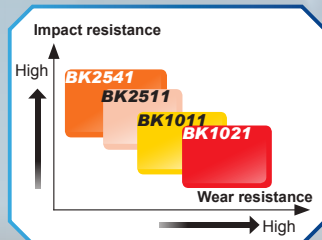
- 21% increase in processing life
- 42% savings in insert cost



Coated PCBN insert

By using a combination of strong PCBN substrate and heat-resistant ceramic coating, developed a new super-hard series product—Coated PCBN inserts, dedicated used for cutting all kinds of hardened steel. The tool life of coated PCBN inserts have been greatly improved, being compared with previous uncoated PCBN inserts.

K Cast iron processing category:



Finishing

- ▶ **BK1011** Extremely high wear resistance and edge retention; Suitable for continuous to intermittent high-speed finishing, and capable of achieving consistent surface quality.
- ▶ **BK1021** Excellent wear resistance and good impact resistance; Suitable for continuous to intermittent heavy-duty roughing, good versatility.

Typical applications: brake discs, brake drums, cylinder liners, compressor parts.

Semi-finishing / Roughing

- ▶ **BK2511** Great wear resistance and outstanding chemical stability; Suitable for continuous to interrupted high speed roughing.
- ▶ **BK2541** Very high wear resistance and excellent fracture toughness; Suitable for continuous to interrupted finishing, good versatility.

Typical application industries: brake discs, brake drums, cylinder liners, compressor parts, rolls, slurry pumps.

S Powder metallurgy and high temperature alloy processing category:

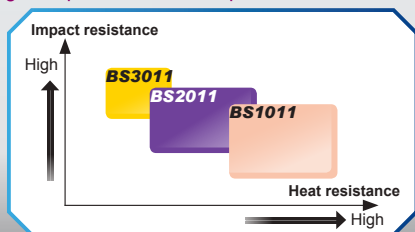
Finishing

- ▶ **BS1011** Excellent wear resistance and chemical stability; Suitable for machining powder metallurgical parts in continuous to lightly interrupted operation; Suitable for machining powder metallurgical parts with more than 10% alloying elements.

- ▶ **BS2011** Excellent heat resistance and chemical stability; Suitable for continuous to lightly interrupted machining of powder metallurgical parts; Suitable for processing powder metallurgical parts with an alloying element content of up to 10%.

- ▶ **BS3011** Very high hardness and wear resistance. Suitable for continuous to interrupted machining of powder metallurgy and high temperature alloy parts.

Typical application industries: automotive parts, high temperature resistant parts.



H Hardened steel processing:

Finishing

- ▶ **BH0121** Excellent heat and wear resistance; Suitable for continuous to lightly interrupted high-speed finishing; Suitable for machining carburized hardened steel such as 20CrMnTi, 20CrMn, 18Cr2Ni4WA, etc.

- ▶ **BH2511** Excellent heat resistance and impact strength; Suitable for continuous to moderate intermittent finishing; Suitable for machining carburized hardened steels such as 20CrMnTi, 20CrMn, 18Cr2Ni4WA, etc.

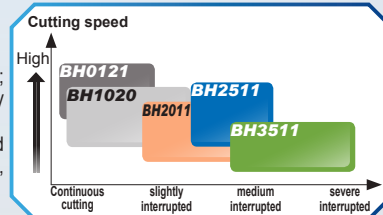
Typical application industries: Gears, bearings.

- ▶ **BH1020** Effective balance of wear resistance and chemical resistance; Suitable for continuous to lightly intermittent finishing of all types of hardened steels, with good versatility.

- ▶ **BH2011** Excellent wear resistance and impact strength; Suitable for continuous to moderate intermittent finishing; Suitable for machining hardened bearing and die steels such as GCr15, 100Cr6, 18Cr2Ni4WA, etc.

- ▶ **BH3511** Excellent chipping resistance and very high fracture toughness; Suitable for roughing and finishing all types of hardened steels in moderate to heavy interrupted work conditions.

Typical application industries: gears, bearings, molds.



Recommended cutting data

Grade	Workpiece material	Cutting speed(m/min)	Feed amount(mm/r)	Depth of cut(mm)
BK1011	Gray cast iron	400-1500	0.02-0.5	0.1-0.3
	Hard cast iron	80-160	0.05-0.5	0.05-0.1
BK1021	Gray cast iron	400-1500	0.02-0.5	0.1-0.3
	Hard cast iron	80-160	0.05-0.5	0.05-0.1
BK2511	Gray cast iron	300-600	0.1-0.5	1-3
	Hard cast iron	50-150	0.1-0.5	1-3
BH0121	Hardened steel	150-250	0.05-0.5	0.05-0.1
		140-220	0.05-0.5	0.05-0.1
		100-170	0.05-0.5	0.05-0.1
		120-180	0.05-0.5	0.05-0.1
		80-150	0.05-0.4	0.05-0.2
BS1011	Powder metallurgy and high temperature alloys	70-180	0.05-0.25	0.03-0.2
		100-200	0.05-0.25	0.03-0.2
		50-160	0.05-0.25	0.03-0.25

PCD tools

PCD tool material has high hardness, excellent wear resistance, low friction coefficient, Excellent thermal conductivity, suitable for non-ferrous metals and its alloys (e.g. Cu, Al, Mg, etc.) Nonmetallic materials and composite materials (such as: MMC, ceramics, reinforced plastics, etc.) machining

N

▶ DN0121

Super-fine grain particle size
great sharpness and edges durability

Application range: suitable for mirror effect occasion

▶ DN0511

Fine grain particle size
Excellent toughness and relatively good wear-resistance

Application range:
strong universality, particular suitable for low-medium silumin materials in milling.

▶ DN1021

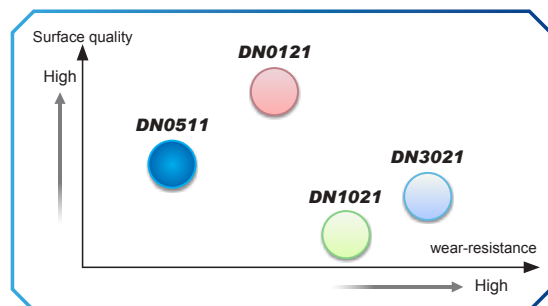
medium grain particle size
Excellent toughness and wear-resistance

Application range:
strong universality, particular suitable for low-medium silumin materials in turning.

▶ DN3021

mixed combined with fine particle and coarse particle
Excellent wear-resistance

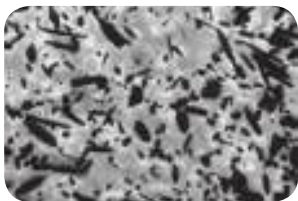
Application range:
suitable for MMC, high silumin, high-strength silumin and bimetallic materials



Recommended cutting data

Grade	Workpiece materials	Machining method	Cutting speed (m/min)
DN0121	Silumin (Si≤12%)	Turning	500~1000
		Milling	300~1500
	fibre reinforced composite materials	Turning /Milling	200~1000
DN0511	Silumin (Si≤12%)	Turning	900~3500
	Metal base compound	Milling	600~2400
		Turning /Milling	1500~1800
		Turning /Milling	400~1260
DN1021	Silumin (Si≤12%)	Cemented carbide	20~40
		Turning	400~1200
	Coppeer and magnesium alloyssilumin	Milling	250~1400
		Turning /Milling	400~1260
DN3021	Silumin (Si≤12%)	Turning	300~700
		Milling	500~1000
	Metal base compound	Milling	500~1000
		Turning	100~200
	Unsintered ceramic materials	Turning	20~50
	Bimetallic materials	Milling	200~300

Ceramic Grade



CN3100

A -sialon/ β -sialon matrix, the latest developed Siloxane sialon.

Applications: With excellent wear resistance, fracture toughness and thermal shock resistance, for use in general machining to finishing in high temperature alloy parts. It has better resistance of breakage at the depth of cut, compared with SiC/Al₂O₃ whisker ceramic material.

Physical properties

Grade	Density(g/cm ³)	HardnessHv(GPa)	Flexural strength(MPa)	Fracture toughness (MPa m ^{1/2})
CN3100	3.34	1720	≥900	7.5

Recommended cutting data

Grade	Workpiece material	Operation	Cutting speed (m/min)	Feed rate(mm/r)	Depth of cut (mm)
CN3100	Nickel high temperature alloy	For roughing	150-260	0.1-0.3	<5

Case

Workpiece material: GH4169
Insert specification: RPGN090700T01020-V
Cutting data: Vc=200 m/min, ap=1 mm,
f=0.1 (mm/r)

Workpiece shape and process: Figure 1, four working procedures, two blades and four cutting edges in the figure finish the milling of turbine disk section, and the wear resistance is excellent.

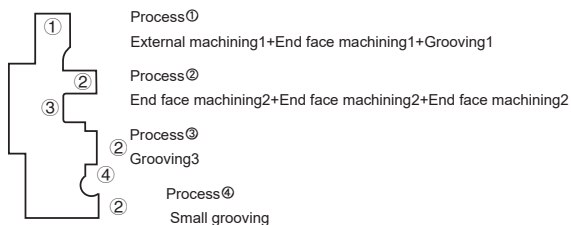


Figure 1



Table of correctional coefficient between material hardness and cutting speed

Workpiece material	Theoretical Hardness	Correctional coefficient between hardness of materials and cutting speed								
		Hardness decrease ← Hardness difference (Measured value – Theoretical value) → Hardness increase								
		-60	-40	-20	0	+20	+40	+60	+80	+100
P	HB180	1.42	1.24	1.11	1.0	0.91	0.84	0.77	0.72	0.67
M	HB180	1.44	1.25	1.11	1.0	0.91	0.84	0.78	0.73	0.68
K	Grey cast iron	HB220	1.21	1.13	1.06	1.0	0.95	0.90	0.86	0.79
	Nodular cast iron	HB250	1.33	1.21	1.09	1.0	0.91	0.84	0.75	0.65
N	HB75			1.05	1.0	0.95				
S	HB350			1.12	1.0	0.89				
Rockwell hardness HRC			-6	-3	0	+3	+6	+9		
H	HRC60		1.10	1.02	1.0	0.96	0.93	0.90		
Actual Cutting Speed = Recommended Cutting Speed × Correctional Coefficient of Cutting Speed										

● Please find recommended cutting parameters on insert packing box.

Example: If the material you are going to machine is normal alloy steel, whose theoretical hardness is HB180, and the selected insert is CNMG120404-DF/YBC151, then the recommended cutting speed is $V=150\text{m/min}$. If the hardness measured value of the material is HB220, then the hardness difference value is $220-180=+40$. Correctional coefficient found in the table is 0.84. Therefore, the actual applicable cutting speed is $V_c=250 \times 0.84=210\text{m/min}$.

Correctional coefficient table between tool life and cutting speed

Tool life Insert materials	Correctional coefficient between tool life and cutting speed					
	10 minutes	15 minutes (Standard life)	30 minutes	45 minutes	60 minutes	90 minutes
YBC151	1.12	1.00	0.82	0.73	0.67	0.60
YBC251	1.11	1.00	0.84	0.76	0.71	0.64
YBC351	1.11	1.00	0.84	0.76	0.70	0.63
YBC152	1.25	1.00	0.68	0.54	0.46	0.37
YBC252	1.55	1.00	0.47	0.30	0.22	0.14
YBM151	1.28	1.00	0.66	0.52	0.43	0.34
YBM153	1.32	1.00	0.64	0.48	0.37	0.31
YBM215	1.22	1.00	0.85	0.77	0.72	0.67
YBM251	1.19	1.00	0.75	0.63	0.56	0.47
YBM253	1.22	1.00	0.73	0.61	0.54	0.45
YBG202	1.10	1.00	0.85	0.77	0.72	0.66
YBG205	1.15	1.00	0.82	0.74	0.69	0.64
YBD052	1.22	1.00	0.80	0.65	0.60	0.55
YBD102	1.20	1.00	0.75	0.62	0.58	0.50
YBD152	1.11	1.00	0.70	0.60	0.50	0.40
YBG105	1.28	1.00	0.79	0.72	0.63	0.58
YBG212	1.25	1.00	0.75	0.70	0.60	0.50
YBS103	1.35	1.00	0.85	0.78	0.68	0.62
Actual cutting speed = Recommended cutting speed × Correctional coefficient of cutting speed						

Example: If the material you are going to machine is normal alloy steel, and the selected insert is CNMG120404-DF/YBC151, then the recommended cutting speed is $V=250\text{m/min}$ (standard life is 15 minutes). If you expect the tool life to reach 60 minutes, the correctional coefficient found in the table is 0.67, then the applicable cutting speed is $V_c=250 \times 0.67=167.5\text{m/min}$.



TURNING General Turning Inserts

General turning inserts code key

General
turning

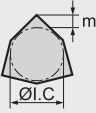
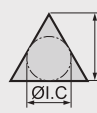
General turning inserts code key

Insert shape/Code		
	A	
	C	
	D	
	H	
	K	
	M	
	O	
	R	
	S	
	T	
	V	
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							

T N M G

Clearance angle of main cutting edge			
Code	Clearance angle	Code	Clearance angle
A		B	
C		D	
E		F	
G		N	
P		O	Other clearance angles

Tolerance									
									
Code	Nose height m Tolerance(mm)	Inscribed circle ØI.C Tolerance(mm)	Thickness S Tolerance(mm)	(Reference) Details of M-level tolerance (Identified by shape)					
				● Nose height tolerance(mm)					
A	±0.005	±0.025	±0.025	Inscribed circle	Regular triangle	Square	Diamond with 80°	Diamond with 55°	Diamond with 35°
F	±0.005	±0.013	±0.025	6.35	±0.08	±0.08	±0.08	±0.11	±0.16
C	±0.013	±0.025	±0.025	9.525	±0.08	±0.08	±0.08	±0.11	±0.16
H	±0.013	±0.013	±0.025	12.7	±0.13	±0.13	±0.13	±0.15	---
E	±0.025	±0.025	±0.025	15.875	±0.15	±0.15	±0.15	±0.18	---
G	±0.025	±0.025	±0.13	19.05	±0.15	±0.15	±0.15	±0.18	---
J	±0.005	±0.05±0.13	±0.025	25.4	---	±0.18	---	---	---
				● Tolerance of inscribed circle ØI.C(mm)					
K	±0.013	±0.05±0.13	±0.025	Inscribed circle	Regular triangle	Square	Diamond with 80°	Diamond with 55°	Diamond with 35°
L	±0.025	±0.05±0.13	±0.025	6.35	±0.05	±0.05	±0.05	±0.05	±0.05
M	±0.08±0.18	±0.05±0.13	±0.13	9.525	±0.05	±0.05	±0.05	±0.05	±0.05
N	±0.08±0.18	±0.05±0.13	±0.025	12.7	±0.08	±0.08	±0.08	±0.08	---
U	±0.13±0.38	±0.08±0.25	±0.13	15.875	±0.10	±0.10	±0.10	±0.10	---
				19.05	±0.10	±0.10	±0.10	±0.10	---
				25.4	---	±0.13	---	---	±0.13



General turning inserts code key

Diameter of IC	Insert shape							
	C	D	R	S	T	V	W	K
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	16
10.0			10					
12.0			12					
12.7	12	15	12	12	22	22	08	
15.875	16		15	15	27			
16.0		19	16					
19.05	19		19	19	33			
20.0			20					
25.0	25	25	25					
25.4			25	25				
31.75			31					
32			32					

Length of cutting edge

Thickness is defined as the height from the bottom of insert to the highest part of cutting edge	
Code	Insert thickness(mm)
00	0.79
T0	0.99
01	1.59
T1	1.98
02	2.38
T2	2.58
03	3.18
T3	3.97
04	4.76
T4	4.96
05	5.96
T5	5.95
06	6.35
T6	6.75
07	7.94
09	9.52
T9	9.72
11	11.11
12	12.70

Insert thickness

22 04 08 - DM (ISO)

4 3 2 (inch)

Inscribed circle	
Code	Diameter of IC(mm)
2	6.35
3	9.525
4	12.7
5	15.875
6	19.05
8	25.4

Thickness	
Code	Thickness (mm)
2	3.18
3	4.76
4	6.35
5	7.94
6	9.52

Nose radius	
Code	Nose radius (mm)
0	0.2
1	0.4
2	0.8
3	1.2
4	1.6
5	2.0
6	2.4

Nose radius code	
Code	Nose radius (mm)
00	No radius
02	0.2
04	0.4
08	0.8
12	1.2
16	1.6
20	2.0
24	2.4
32	3.2
X	Others

Diameter of insert (Metric) Round insert

Chipbreaker code		
DF	DM	DR
HF	HM	HR
EF	EM	ER
NF	NM	SF
PM	WGF	SNR

General turning

General turning inserts code key



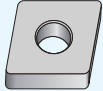
General Turning Inserts

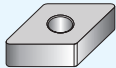
Metric and inch comparison table of general turning inserts

Metric and inch comparison table of negative inserts

General turning

Metric and inch comparison table of general turning inserts

C-type negative angle	(ISO)	(Inch)	Chipbreaker
Insert shape 	090304	321	-DF
	090308	322	-WGF
	120404	431	-SF
	120408	432	-EF
	120412	433	-NF
	120416	434	-WGM
	160608	542	-PM
	160612	543	-DM
	160616	544	-EM
	190608	642	-NM
	190612	643	-DR
	190616	644	-ER
	190624	646	-LR
	250724	856	-HPR
	250732	858	-SNR
	250924	866	
	250932	868	

D-type negative angle	(ISO)	(Inch)	Chipbreaker
Insert shape 	110404	331	-EF
	110408	332	-DF
	110412	333	-WGF
	150404	431	-SF
	150408	432	-NF
	150412	433	-WGM
	150604	441	-PM
	150608	442	-DM
	150612	443	-EM
	150616	444	-NM
	190608	542	-DR
	190612	543	-ER
			-LR
			-HPR
			-SNR
			-NGF

V-type negative angle	(ISO)	(Inch)	Chipbreaker
Insert shape 	160404	331	-DF -EF
	160408	332	-SF -NF
	160412	333	-PM -DM
			-EM -NM
			-SNR -NGF

R-type negative angle	(ISO)	(Inch)	Chipbreaker
Insert shape 	120400	43	

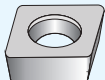
W-type negative angle	(ISO)	(Inch)	Chipbreaker
Insert shape 	06T304	3(2.5)1	-DF
	06T308	3(2.5)2	-WGF
	06T312	3(2.5)3	-SF
	060404	331	-EF
	060408	332	-NF
	060412	333	-WGM
	080404	431	-PM
	080408	432	-DM
	080412	433	-EM
			-NM
			-DR
			-SNR

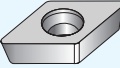
T-type negative angle	(ISO)	(Inch)	Chipbreaker
Insert shape 	110304	221	-DF
	110308	222	-WGF
	160404	331	-SF
	160408	332	-EF
	160412	333	-NF
	220404	431	-WGM
	220408	432	-PM
	220412	433	-DM
	220416	434	-EM
	270608	542	-DR
	270612	543	-ER
	270616	544	-LR
			-HPR
			-SNR

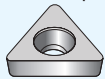
S-type negative angle	(ISO)	(Inch)	Chipbreaker
Insert shape 	090304	321	
	090308	322	
	090312	323	
	120404	431	-DF
	120408	432	-SF
	120412	433	-EF
	120416	434	-NF
	150608	542	-WGM
	150612	543	-PM
	150616	544	-DM
	190412	633	-EM
	190424	636	-NM
	190612	643	-DR
	190616	644	-ER
	250724	856	-LR
	250732	858	-HPR
	250924	866	-SNR
	250932	868	



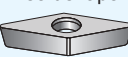
Metric and inch comparison table of positive insert

C-type positive angle	(ISO)	(Inch)	Chipbreaker
Insert shape 	060202	2(1.5)0	-USF
	060204	2(1.5)1	-SF
	060208	2(1.5)2	-HF
	09T302	3(2.5)0	-EF
	09T304	3(2.5)1	-HM
	09T308	3(2.5)2	-EM
	120404	431	-HR
	120408	432	-LH
	120412	433	-LC

D-type positive angle	(ISO)	(Inch)	Chipbreaker
Insert shape 	070202	2(1.5)0	-USF
	070204	2(1.5)1	-SF
	070208	2(1.5)2	-HF
	11T302	3(2.5)0	-EF
	11T304	3(2.5)1	-HM
	11T308	3(2.5)2	-EM
	11T312	3(2.5)3	-HR
			-LH
			-LC

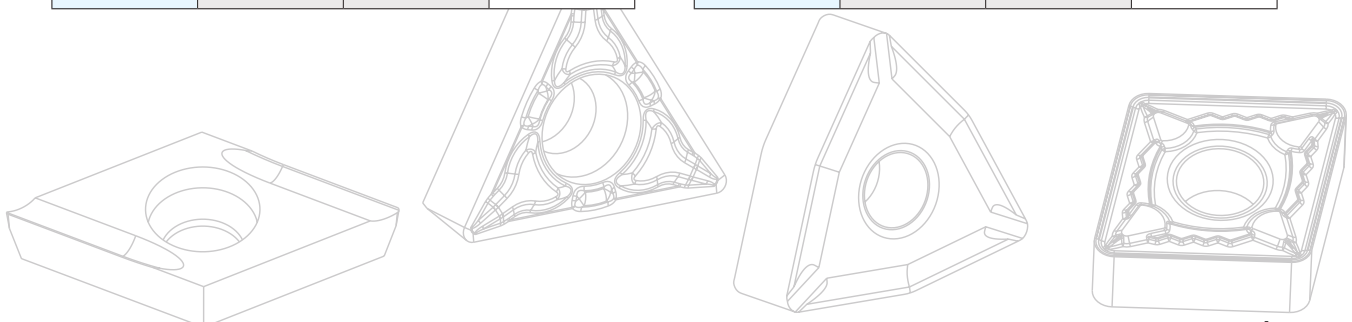
T-type positive angle	(ISO)	(Inch)	Chipbreaker
Insert shape 	06T102	1.2(1.2)0	-USF -SF -HF -EF -HM -EM -HR -LH -LC
	06T104	1.2(1.2)1	
	06T108	1.2(1.2)2	
	090202	1.8(1.5)0	
	090204	1.8(1.5)1	
	090208	1.8(1.5)2	
	110202	2(1.5)0	
	110204	2(1.5)1	
	110208	2(1.5)2	
	110302	220	
	110304	221	
	110308	222	
	16T302	3(2.5)0	
	16T304	3(2.5)1	
	16T308	3(2.5)2	
	16T312	3(2.5)3	
	160400	330	
	220408	432	
	220412	433	
	220416	434	
	270408	532	
	270412	533	
	330612	643	
	330616	644	

S-type positive angle	(ISO)	(Inch)	Chipbreaker
Insert shape 	060204	2(1.5)1	-HF -EF -HM -EM -HR -LH -LC
	09T302	3(2.5)0	
	09T304	3(2.5)1	
	09T308	3(2.5)2	
	120404	431	
	120408	432	
	120412	433	
	150404	531	
	150408	532	
	150412	533	
	190408	632	
	190412	633	
	190416	634	

V-type positive angle	(ISO)	(Inch)	Chipbreaker
Insert shape 	110202	2(1.5)0	-USF -SF -HF -NF -LH -LC -NGF
	110204	2(1.5)1	
	110208	2(1.5)2	
	110302	220	
	110304	221	
	110308	222	
	160402	330	
	160404	331	
	160408	332	
	160412	333	

General turning

Metric and inch comparison table of general turning inserts

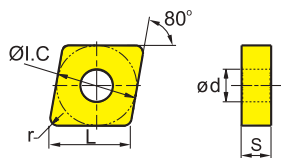


TURNING / General Turning Inserts

- **Cemented carbide and cermet inserts**

CN ☐ ☐ (Negative inserts)

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

[illegible][illegible]

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

Applicable tool



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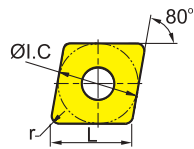


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A212


CN (Negative inserts)

 Good working condition
  Normal working condition
  Bad working condition


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

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermet	Coated cermet	Cemented carbide									
		L	ØI.C	S	ød	r	YBC151	YBC152	YBC251	YBC252	YBC351	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBM151	YBM153	YBM215	YBM251					YBM253	YBS103	YBD052	YBD102	YBD152	YBD252		
NF  For finishing	CNEG120404-NF	12.9	12.7	4.76	5.16	0.4							●	★																			○	
	CNEG120408-NF	12.9	12.7	4.76	5.16	0.8								○	★																		○	
	CNEG120412-NF	12.9	12.7	4.76	5.16	1.2								○	★																		○	
WGM  For finishing Wiper	CNMG120408-WGM	12.9	12.7	4.76	5.16	0.8				★						★												★						
	CNMG120412-WGM	12.9	12.7	4.76	5.16	1.2					★						★												★					
PM  For semi- finishing	CNMG090304-PM	9.7	9.525	3.18	3.81	0.4	★	●	○																									
	CNMG090308-PM	9.7	9.525	3.18	3.81	0.8		○	●	○																		★						
	CNMG120404-PM	12.9	12.7	4.76	5.16	0.4	★	●	★	○																	★	★	○					
	CNMG120408-PM	12.9	12.7	4.76	5.16	0.8	●	★	●	★	●																★	★	★					
	CNMG120412-PM	12.9	12.7	4.76	5.16	1.2		○	●	★	●																★	★	★					
	CNMG120416-PM	12.9	12.7	4.76	5.16	1.6	★	●	○	●																	★	○						
	CNMG160608-PM	16.1	15.875	6.35	6.35	0.8	●	○	●	○	○																○	○						
	CNMG160612-PM	16.1	15.875	6.35	6.35	1.2	●	○	●	○	●																★	○						
	CNMG160616-PM	16.1	15.875	6.35	6.35	1.6			●	○																		○	○					
	CNMG190608-PM	19.3	19.05	6.35	7.94	0.8	★	●	○	○																			★					
	CNMG190612-PM	19.3	19.05	6.35	7.94	1.2	★	●	★	●																		○	★					
	CNMG190616-PM	19.3	19.05	6.35	7.94	1.6	●	★	●	○	●																	○						

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

Applicable tool

DCLNR/L
 Kr:95°


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PCBNR/L
 Kr:75°


A172

PCLNR/L
 Kr:95°


A173

PCLNR/L
 Kr:95°


A212

Insert code key

A50-A51

Grade selection reference

A19/A36-A48

Chipbreaker selection reference

A22-A35

Recommended cutting parameters

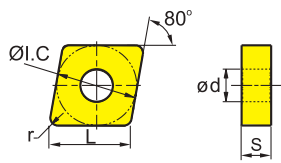
A241-A244

TURNING / General Turning Inserts

- **Cemented carbide and cermet inserts**

CN ☐ ☐ (Negative inserts)

😊 Good working condition 😐 Normal working condition 😞 Bad working condition



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

[illegible]

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

Applicable tool

DCLNR/L
Kr:95°



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PCBNR/L
Kr:75°

A172

PCLNR/L
Kr:95°



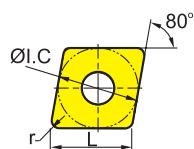
A173

PCLNR/L
Kr:95°



A212

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



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

DCNLNR/L Kr:95°	PCBNR/L Kr:75°	PCLNR/L Kr:95°	PCLNR/L Kr:95°
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A212

Recommended cutting parameters

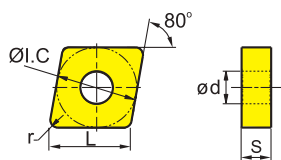
A241–A244

TURNING / General Turning Inserts

- **Cemented carbide and cermet inserts**

CN ☐ ☐ (Negative inserts)

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

[illegible][illegible]

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

Applicable tool

DCLNR/L
Kr:95°



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PCBNR/L
Kr:75°



A172

PCLNR/L
Kr:95°



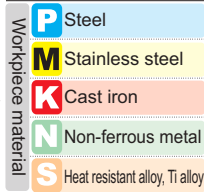
A173

PCLNR/L
Kr:95°



A212

😊 Good working condition 😐 Normal working condition 😞 Bad working condition



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

DCLNr/L Kr:95°	PCBNr/L Kr:75°	PCLNr/L Kr:95°	PCLNr/L Kr:95°
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A212

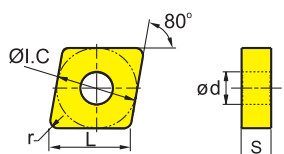
Recommended cutting parameters **A241–A244**

TURNING / General Turning Inserts

- **Cemented carbide and cermet inserts**

CN ☐ ☐ (Negative inserts)

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

[illegible][illegible]

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

Applicable tool

DCLNR/L
Kr:95°



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PCBNR/L
Kr:75°

A172

PCLNR/L
Kr:95°



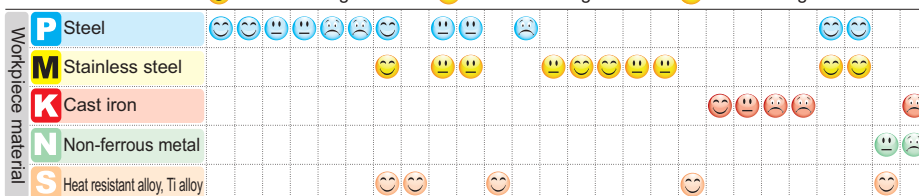
A173

PCLNR/L
Kr:95°



A212

😊 Good working condition 😐 Normal working condition 😞 Bad working condition



Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																	Cermet	Coated cermet	Cemented carbide						
		L	ØI.C	S	ød	r	YBC151	YBC152	YBC251	YBC252	YBC351	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBM151	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YBD252	YNG151	YNG151C	YD101	YD201
 DF For finishing	DNMG110404-DF	11.6	9.525	4.76	3.81	0.4		○	●	○																				●		
	DNMG110408-DF	11.6	9.525	4.76	3.81	0.8		○	○	○																						
	DNMG110412-DF	11.6	9.525	4.76	3.81	1.2		○	○																							
	DNMG150404-DF	15.5	12.7	4.76	5.16	0.4		★	●	★																						
	DNMG150408-DF	15.5	12.7	4.76	5.16	0.8		★	●	★																						
	DNMG150412-DF	15.5	12.7	4.76	5.16	1.2		○		○																						
	DNMG150604-DF	15.5	12.7	6.35	5.16	0.4		●	★	●	★											○										
	DNMG150608-DF	15.5	12.7	6.35	5.16	0.8		★	●	○																						
	DNMG150612-DF	15.5	12.7	6.35	5.16	1.2			○																							
 WGF For finishing Wiper	DNMX110404-WGF	11.6	9.525	4.76	3.81	0.4		★												★					★							
	DNMX110408-WGF	11.6	9.525	4.76	3.81	0.8		★												★					★							
	DNMX150404-WGF	15.5	12.7	4.76	5.16	0.4		★												★					★							
	DNMX150408-WGF	15.5	12.7	4.76	5.16	0.8		★												★					★							
	DNMX150604-WGF	15.5	12.7	6.35	5.16	0.4		★												★					★							
	DNMX150608-WGF	15.5	12.7	6.35	5.16	0.8		★												★					★							

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

DDJNR/L Kr:93° 	PDJNR/L Kr:93° 	PDPNN Kr:62°30' 	PDPNR/L Kr:62°30' 	PDUNR/L Kr:93°
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A214

Recommended cutting parameters

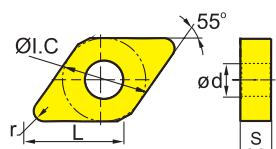
A241–A244

TURNING / General Turning Inserts

- **Cemented carbide and cermet inserts**

DN ☐ ☐ (Negative inserts)

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

[illegible]

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermet	Coated cermet	Cemented carbide								
		L	ØL.C	S	ød	r	YBC151	YBC162	YBC251	YBC252	YBC351	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBM151	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YBD252	YNG151	YNG151C	YD101	YD201	
 SF For finishing	DNMG110404-SF	11.6	9.525	4.76	3.81	0.4							○																	○	★		
	DNMG150404-SF	15.5	12.7	4.76	5.16	0.4							○																	○	★		
	DNMG150408-SF	15.5	12.7	4.76	5.16	0.8							○																	○	★		
	DNMG150604-SF	15.5	12.7	6.35	5.16	0.4							○																	○	★		
	DNMG150608-SF	15.5	12.7	6.35	5.16	0.8							○																	○	★		
 EF For finishing	DNMG110404-EF	11.6	9.525	4.76	3.81	0.4								● ★					★ ★														
	DNMG110408-EF	11.6	9.525	4.76	3.81	0.8								○ ★					★ ○														
	DNMG110412-EF	11.6	9.525	4.76	3.81	1.2								○ ★					★ ○														
	DNMG150404-EF	15.5	12.7	4.76	5.16	0.4								● ★					★ ○														
	DNMG150408-EF	15.5	12.7	4.76	5.16	0.8								● ★					★ ○														
	DNMG150412-EF	15.5	12.7	4.76	5.16	1.2								○ ★					★ ○														
	DNMG150604-EF	15.5	12.7	6.35	5.16	0.4								● ★					★ ★														
	DNMG150608-EF	15.5	12.7	6.35	5.16	0.8								● ★					★ ★														
	DNMG150612-EF	15.5	12.7	6.35	5.16	1.2								○ ★					★ ★														
 NF For finishing	DNEG150404-NF	15.5	12.7	4.76	5.16	0.4							○ ★																			○	
	DNEG150408-NF	15.5	12.7	4.76	5.16	0.8							○ ★																			○	
	DNEG150604-NF	15.5	12.7	6.35	5.16	0.4								● ★																		○	
	DNEG150608-NF	15.5	12.7	6.35	5.16	0.8								● ★																		○	
 NGF For finishing	DNEG150408-NGF	15.5	12.7	4.76	5.16	0.8							○ ●			○																	
	DNEG150412-NGF	15.5	12.7	4.76	5.16	1.2							○ ●			○																	
	DNEG150608-NGF	15.5	12.7	6.35	5.16	0.8							○ ●			○																	
	DNEG150612-NGF	15.5	12.7	6.35	5.16	1.2							○ ●			○																	

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

Applicable tool

DDJNR/L
Kr:93°

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PDJNR/L
Kr:93°



A174

PDPNN
Kr:62°30'



A175

PDPNR/L
Kr:62°30'



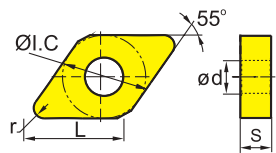
A213

PDUNR/L
Kr:93°



A214


DN (Negative inserts)

 Good working condition
  Normal working condition
  Bad working condition


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

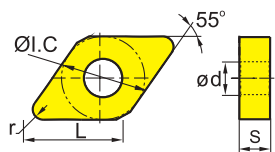
																																																																																																																																																															
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TURNING / General Turning Inserts

- **Cemented carbide and cermet inserts**

DN ☐ ☐ (Negative 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

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																		Cermet	Coated cermet	Cemented carbide							
		L	ØI.C	S	ød	r	YBC151	YBC152	YBC251	YBC252	YBC351	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBM151	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YBD252	YNG151	YNG151C	YD101	YD201		
 DM For semi-finishing	DNMG110404-DM	11.6	9.525	4.76	3.81	0.4		●	●	○												○												
	DNMG110408-DM	11.6	9.525	4.76	3.81	0.8		★	●	★	○											●												
	DNMG110412-DM	11.6	9.525	4.76	3.81	1.2		○		○																								
	DNMG150404-DM	15.5	12.7	4.76	5.16	0.4		○	●	★																			○					
	DNMG150408-DM	15.5	12.7	4.76	5.16	0.8		★	●	★																			●					
	DNMG150412-DM	15.5	12.7	4.76	5.16	1.2		★	○	★																								
	DNMG150416-DM	15.5	12.7	4.76	5.16	1.6					○																							
	DNMG150604-DM	15.5	12.7	6.35	5.16	0.4		★	●	★	○											●								●				
	DNMG150608-DM	15.5	12.7	6.35	5.16	0.8		★	●	★	●											●												
	DNMG150612-DM	15.5	12.7	6.35	5.16	1.2		●	●	★	○																							
	DNMG150616-DM	15.5	12.7	6.35	5.16	1.6		○	○	○																								
 EM For semi-finishing	DNMG110404-EM	11.6	9.525	4.76	3.81	0.4								○	★					○	★													
	DNMG110408-EM	11.6	9.525	4.76	3.81	0.8								○	★					○	★													
	DNMG110412-EM	11.6	9.525	4.76	3.81	1.2								○	★					○	★													
	DNMG150404-EM	15.5	12.7	4.76	5.16	0.4								●	★					★	★													
	DNMG150408-EM	15.5	12.7	4.76	5.16	0.8								●	★					★	★													
	DNMG150412-EM	15.5	12.7	4.76	5.16	1.2								○	★					★	★													
	DNMG150604-EM	15.5	12.7	6.35	5.16	0.4						○		●	★					○	★													
	DNMG150608-EM	15.5	12.7	6.35	5.16	0.8								●	★					○	★													
	DNMG150612-EM	15.5	12.7	6.35	5.16	1.2								○	★					○	★													
	 NM For semi-finishing	DNMG150412-NM	15.5	12.7	4.76	5.16	1.2						○	★									○									○		
DNMG150612-NM		15.5	12.7	6.35	5.16	1.2						●	★										○								○			

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

Applicable tool



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A175



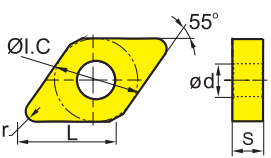
A213



A214


DN (Negative inserts)

Good working condition
 Normal working condition
 Bad working condition

							P Steel																															
							M Stainless steel																															
							K Cast iron																															
							N Non-ferrous metal																															
							S Heat resistant alloy, Ti alloy																															
Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																	Cermet YNG151	Coated cermet YNG151C	Cemented carbide YD101	Cemented carbide YD201											
		L	ØI.C	S	ød	r	YBC151	YBC152	YBC251	YBC252	YBC351	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBM151	YBM153	YBM215	YBM251	YBM253					YBS103	YBD052	YBD102	YBD152	YBD252						
 Light-load roughing	DNMM150608-LR	15.5	12.7	6.35	5.16	0.8			★																													
	DNMM150612-LR	15.5	12.7	6.35	5.16	1.2			★																													
	DNMM150616-LR	15.5	12.7	6.35	5.16	1.6			★																													
 For light roughing	DNMG150408-DR	15.5	12.7	4.76	5.16	0.8			○																													
	DNMG150412-DR	15.5	12.7	4.76	5.16	1.2			○																													
	DNMG150416-DR	15.5	12.7	4.76	5.16	1.6				○	○																											
	DNMG150608-DR	15.5	12.7	6.35	5.16	0.8	★	○	○	○																●	●											
	DNMG150612-DR	15.5	12.7	6.35	5.16	1.2	○	●	★	○																○	●											
	DNMG150616-DR	15.5	12.7	6.35	5.16	1.6					○																	○										
 For roughing	DNMM150608-DR	15.5	12.7	6.35	5.16	0.8	○	○																														
	DNMM150612-DR	15.5	12.7	6.35	5.16	1.2	○	●																														
	DNMM150616-DR	15.5	12.7	6.35	5.16	1.6					○																											
 For roughing	DNMG150608-ER	15.5	12.7	6.35	5.16	0.8																		★														
	DNMG150612-ER	15.5	12.7	6.35	5.16	1.2																		★														
 For roughing	DNMM150608-ER	15.5	12.7	6.35	5.16	0.8																		★														
	DNMM150612-ER	15.5	12.7	6.35	5.16	1.2																		★														
 For roughing	DNMG150608-SNR	15.5	12.7	6.35	5.16	0.8							○	●		○								●														
	DNMG150612-SNR	15.5	12.7	6.35	5.16	1.2							○	●		○								●														

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

Applicable tool



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A175

A213

A214

Insert code key

A50-A51

Grade selection reference

A19/A36-A48

Chipbreaker selection reference

A22-A35

Recommended cutting parameters

A241-A244

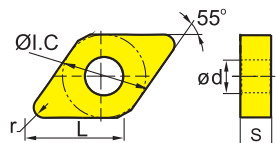
General turning

Cemented carbide and cermet inserts

TURNING / General Turning Inserts

- **Cemented carbide and cermet inserts**

DN ☐ ☐ (Negative inserts)



😊 Good working condition 😐 Normal working condition 😞 Bad working condition

Workpiece material	Tool material
P Steel	High speed steel
M Stainless steel	Coated high speed steel
K Cast iron	Coated high speed steel
N Non-ferrous metal	Aluminum nitride
S Heat resistant alloy, Ti alloy	Aluminum nitride

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																	Cermel	Coated cermel	Cemented carbide						
		L	ØI.C	S	ød	r	YBC151	YBC152	YBC251	YBC252	YBC351	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBM151	YBM153	YBM215	YBM251	YBM253			YBS103	YBD052	YBD102	YBD152	YBD252	YNG151	YNG151C
 For heavy machining	DNMM150608-HDR	15.5	12.7	6.35	5.16	0.8		○		○	○																					
	DNMM150612-HDR	15.5	12.7	6.35	5.16	1.2					○	○																				
	DNMM150616-HDR	15.5	12.7	6.35	5.16	1.6						○	○																			
 All round	DNMG150604	15.5	12.7	6.35	5.16	0.4			○																							
	DNMG150608	15.5	12.7	6.35	5.16	0.8			○																							
	DNMG150612	15.5	12.7	6.35	5.16	1.2			○																							
	DNMG150616	15.5	12.7	6.35	5.16	1.6			○																							
	DNMG190608	19.3	15.875	6.35	7.94	0.8			○																							
	DNMG190612	19.3	15.875	6.35	7.94	1.2			○		○																					
 Without chipbreaker	DNMA110416	11.6	9.525	4.76	3.81	1.6																						○				
	DNMA110424	11.6	9.525	4.76	3.81	2.4																						○				
	DNMA150404	15.5	12.7	4.76	5.16	0.4																						○				
	DNMA150408	15.5	12.7	4.76	5.16	0.8																				★ ★	○					
	DNMA150604	15.5	12.7	6.35	5.16	0.4																				○ ○	○					
	DNMA150608	15.5	12.7	6.35	5.16	0.8																				○ ★ ★						
	DNMA150612	15.5	12.7	6.35	5.16	1.2																				○ ○	○					
	DNMA150616	15.5	12.7	6.35	5.16	1.6																					○ ○					

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

Applicable tool



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A174



A175

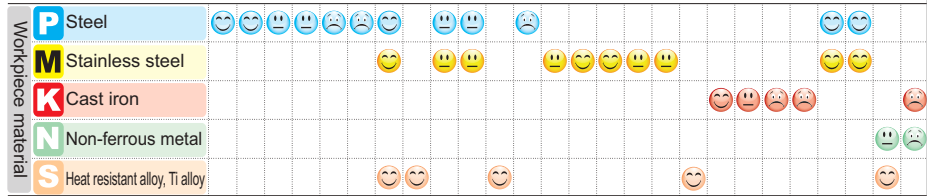


A213



A214

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

[illegible]

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

DSBNR/L Kr:75° Page A168	PSBNR/L Kr:75° A176	PSDNN Kr:45° A177	PSKNR/L Kr:75° A178	PSSNR/L Kr:45° A179	PSKNR/L Kr:75° A215
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A215

Recommended cutting parameters

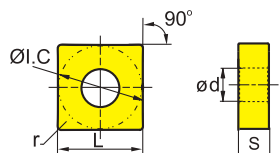
A241–A244

TURNING / General Turning Inserts

- **Cemented carbide and cermet inserts**

SN ☐ ☐ (Negative inserts)

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

[illegible][illegible]

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

Applicable tool

DSBNR/L
Kr:75°



Page A168

PSBNR/L
Kr:75°



A176

PSDNN
Kr:45°



A177

PSKNR/L
Kr:75°

A178

PSSNR/L
Kr:45°



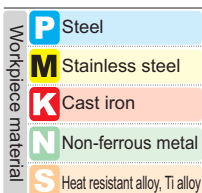
A179

PSKNR/L
Kr:75°



A215

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

[illegible]

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

DSBNR/L
Kr:75°



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A176



A177



A178



A179



A215

Insert code key

A50–A51

Grade selection reference

A19/A36–A48

Chipbreaker selection reference

A22–A35

Recommended cutting parameters

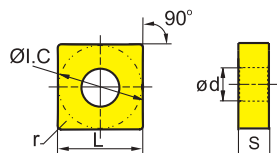
A241–A244

TURNING / General Turning Inserts

- **Cemented carbide and cermet inserts**

SN ☐ ☐ (Negative inserts)

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

[illegible]

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																	Cermetal	Coated cermet	Cemented carbide									
		L	ØI.C	S	ød	r	YBC151	YBC152	YBC251	YBC252	YBC351	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBM151	YBM153	YBM215	YBM251	YBM253			YBS103	YBD052	YBD102	YBD152	YBD252	YNG151	YNG151C	YD101	YD201	
 For light roughing	SNMG120408-DR	12.7	12.7	4.76	5.16	0.8		○	●	★	○																○	○							
	SNMG120412-DR	12.7	12.7	4.76	5.16	1.2			●	○	●																○								
	SNMG120416-DR	12.7	12.7	4.76	5.16	1.6		○	○	○																									
	SNMG150608-DR	15.875	15.875	6.35	6.35	0.8				○																									
	SNMG150612-DR	15.875	15.875	6.35	6.35	1.2			●	★	●																○	○							
	SNMG150616-DR	15.875	15.875	6.35	6.35	1.6			●	★																	○	○							
	SNMG150624-DR	15.875	15.875	6.35	6.35	2.4				○																									
	SNMG190612-DR	19.05	19.05	6.35	7.94	1.2			●	○	○																								
	SNMG190616-DR	19.05	19.05	6.35	7.94	1.6			●	★	●																	○	○						
	SNMG190624-DR	19.05	19.05	6.35	7.94	2.4			●	○	○																								
 For roughing	SNMM120408-DR	12.7	12.7	4.76	5.16	0.8					○																								
	SNMM120412-DR	12.7	12.7	4.76	5.16	1.2					○																								
	SNMM120416-DR	12.7	12.7	4.76	5.16	1.6					○																								
	SNMM150608-DR	15.875	15.875	6.35	6.35	0.8					○																								
	SNMM150612-DR	15.875	15.875	6.35	6.35	1.2					○																								
	SNMM150616-DR	15.875	15.875	6.35	6.35	1.6			●		○																								
	SNMM190608-DR	19.05	19.05	6.35	7.94	0.8						○																							

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

Applicable tool



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A176



A177



A178

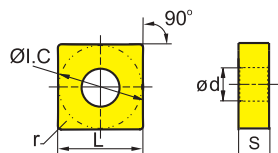


A179



A215

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

[illegible][illegible]

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

DSBNR/L
Kr:75°



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A176



A177



A178



A179



A215

Insert code key

A50–A51

Grade selection reference

A19/A36–A48

Chipbreaker selection reference

A22–A35

Recommended cutting parameters

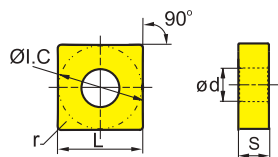
A241–A244

TURNING / General Turning Inserts

- **Cemented carbide and cermet inserts**

SN ☐ ☐ (Negative 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

General turning

Cemented carbide and cermet inserts

[illegible]

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

Applicable tool

DSBNR/L
Kr:75°



Page A168

PSBNR/L
Kr:75°



A176

PSDNN
Kr:45°



A177

PSKNR/L
Kr:75°



A178

PSSNR/L
Kr:45°



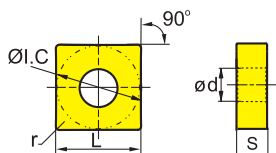
A179

PSKNR/L
Kr:75°



A215

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

[illegible][illegible]

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

DSBNR/L
Kr:75°



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A176



A177



A178



A179



A215

Insert code key

A50–A51

Grade selection reference

A19/A36–A48

Chipbreaker selection reference

A22–A35

Recommended cutting parameters

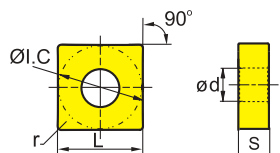
A241–A244

TURNING / General Turning Inserts

- **Cemented carbide and cermet inserts**

SN ☐ ☐ (Negative inserts)

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

[illegible]

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermet	Coated cermet	Cemented carbide						
		L	ØI.C	S	ød	r	YBC151	YBC152	YBC251	YBC252	YBC351	YBC352	YBG102	YBG105	YBG202	YBG212	YBG302	YBM151	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YBD252	YNG151	YNG151C	YD101	YD201
All round 	SNMM190608	19.05	19.05	6.35	7.94	0.8		○																							
	SNMM190612	19.05	19.05	6.35	7.94	1.2		○																							
	SNMM190616	19.05	19.05	6.35	7.94	1.6		○																							
	SNMM250724	25.4	25.4	7.94	9.12	2.4		●		●																					
	SNMM250924	25.4	25.4	9.525	9.12	2.4					○																				
Without chipbreaker 	SNMA090304	9.525	9.525	3.18	3.81	0.4																					○				
	SNMA090308	9.525	9.525	3.18	3.81	0.8																			○	○					
	SNMA120404	12.7	12.7	4.76	5.16	0.4																			○						
	SNMA120408	12.7	12.7	4.76	5.16	0.8																			○	★	★				●
	SNMA120416	12.7	12.7	4.76	5.16	1.6																			○	○	★				
	SNMA150608	15.875	15.875	6.35	6.35	0.8																					○				
	SNMA150612	15.875	15.875	6.35	6.35	1.2																					★				
	SNMA190612	19.05	19.05	6.35	7.94	1.2																			○	○	★				
	SNMA190616	19.05	19.05	6.35	7.94	1.6																					★	★			

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

Applicable tool

DSBNR/L
Kr:75°



Page A168

PSBNR/L
Kr:75°



A176

PSDNN
Kr:45°



A177

PSKNR/L
Kr:75°



A178

PSSNR/L
Kr:45°



A179

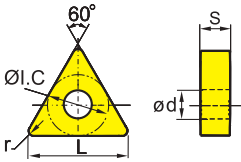
PSKNR/L
Kr:75°



A215


TN (Negative 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	</
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★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool



Page A169

A180

A181

A182

A216

Insert code key

A50-A51

Grade selection reference

A19/A36-A48

Chipbreaker selection reference

A22-A35

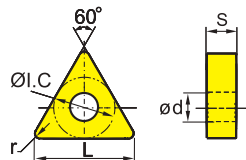
Recommended cutting parameters

A241-A244

TURNING / General Turning Inserts

- **Cemented carbide and cermet inserts**

TN ☐ ☐ (Negative inserts)



😊 Good working condition 😐 Normal working condition 😞 Bad working condition

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

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																	Cermet	Coated cermet	Cemented carbide							
		L	ØI.C	S	ød	r	YBC151	YBC152	YBC251	YBC252	YBC351	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBM151	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YBD252	YNG151	YNG151C	YD101	YD201	
 EF For finishing	TNMG110304-EF	11	6.35	3.18	2.26	0.4									○ ★				★ ○														
	TNMG110308-EF	11	6.35	3.18	2.26	0.8									○ ★				★ ○														
	TNMG160404-EF	16.5	9.525	4.76	3.81	0.4									● ★				★ ★														
	TNMG160408-EF	16.5	9.525	4.76	3.81	0.8									● ★				★ ★														
	TNMG160412-EF	16.5	9.525	4.76	3.81	1.2									○ ★				★ ★														
	TNMG220404-EF	22	12.7	4.76	5.16	0.4									○ ★				★ ○														
	TNMG220408-EF	22	12.7	4.76	5.16	0.8									○ ★				★ ○														
	TNMG220412-EF	22	12.7	4.76	5.16	1.2									○ ★				★ ○														
 WGM For semi-finishing Wiper	TNMX160408-WGM	16.5	9.525	4.76	3.81	0.8			★					★													★						
	TNMX160412-WGM	16.5	9.525	4.76	3.81	1.2			★					★													★						
 PM For semi-finishing	TNMG110304-PM	11	6.35	3.18	2.26	0.4	★	●	○																								
	TNMG110308-PM	11	6.35	3.18	2.26	0.8	★	○	○																								
	TNMG160404-PM	16.5	9.525	4.76	3.81	0.4	★	●	★																	★	★						
	TNMG160408-PM	16.5	9.525	4.76	3.81	0.8	★	●	★	●	○															★	★	★					
	TNMG160412-PM	16.5	9.525	4.76	3.81	1.2	★	●	○	○																★	★	○					
	TNMG220408-PM	22	12.7	4.76	5.16	0.8	★	●	○	●																★	○	○					
	TNMG220412-PM	22	12.7	4.76	5.16	1.2	●	★	●	○	○															○	○						
	TNMG220416-PM	22	12.7	4.76	5.16	1.6		○	○																		○						

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

Applicable tool



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A181

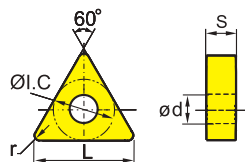


A182



A216

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

[illegible][illegible]

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

DTGNR/L Kr:91°	PTFNR/L Kr:90°	PTTNR/L Kr:60°	PTGNR/L Kr:90°	PTFNR/L Kr:90°
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A181

A182

A216

Insert code key

A50–A51

Grade selection reference

A19/A36–A48

Chipbreaker selection reference

A22–A35

Recommended cutting parameters

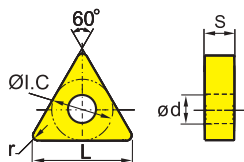
A241–A244

TURNING / General Turning Inserts

- **Cemented carbide and cermet inserts**

TN ☐ ☐ (Negative inserts)

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

[illegible]

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																		Cernmet	Coated cernmet	Cemented carbide				
		L	ØI.C	S	ød	r	YBC151	YBC152	YBC251	YBC252	YBC351	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBM151	YBM153	YBM215	YBM251	YBM253	YBS103				YBD052	YBD102	YBD152	YBD252
 For light roughing	TNMG160408-DR	16.5	9.525	4.76	3.81	0.8	○		○	○																○	○				
	TNMG160412-DR	16.5	9.525	4.76	3.81	1.2	○	○	○	○																●	●				
	TNMG220408-DR	22	12.7	4.76	5.16	0.8				○	●															○					
	TNMG220412-DR	22	12.7	4.76	5.16	1.2			○	○	○																○				
	TNMG220416-DR	22	12.7	4.76	5.16	1.6					○															○					
	TNMG270608-DR	27.5	15.875	6.35	6.35	0.8					○																				
	TNMG270612-DR	27.5	15.875	6.35	6.35	1.2					○																				
	TNMG270616-DR	27.5	15.875	6.35	6.35	1.6					○																				
 For roughing	TNMM160408-DR	16.5	9.525	4.76	3.81	0.8		○		○																					
	TNMM160412-DR	16.5	9.525	4.76	3.81	1.2		○		○																					
	TNMM220408-DR	22	12.7	4.76	5.16	0.8			●		●																				
	TNMM220412-DR	22	12.7	4.76	5.16	1.2			●		○																				
	TNMM220416-DR	22	12.7	4.76	5.16	1.6			○		○																				
	TNMM270612-DR	27.5	15.875	6.35	5.16	1.2					○																				
	TNMM270616-DR	27.5	15.875	6.35	5.16	1.6					○																				
 For roughing	TNMG160408-ER	16.5	9.525	4.76	3.81	0.8																			★						
	TNMG160412-ER	16.5	9.525	4.76	3.81	1.2																			★						
	TNMG220408-ER	22	12.7	4.76	5.16	0.8																			★						
	TNMG220412-ER	22	12.7	4.76	5.16	1.2																			★						
 For roughing	TNMG160408-SNR	16.5	9.525	4.76	3.81	0.8						○	●			○									●						

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

Applicable tool



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A180



A181

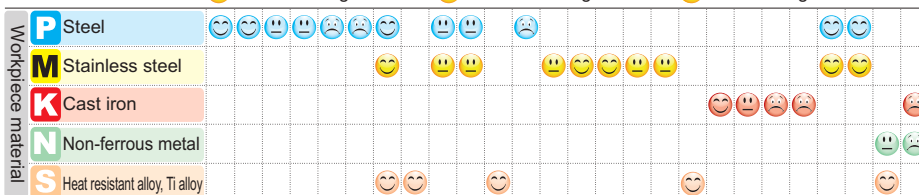


A182



A216

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

[illegible]

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

DTGNR/L Kr:91°	PTFNR/L Kr:90°	PTTNR/L Kr:60°	PTGNR/L Kr:90°	PTFNR/L Kr:90°
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A216

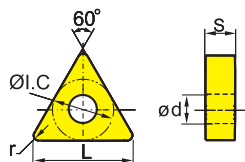
Recommended cutting parameters

A241–A244

TURNING / General Turning Inserts

- **Cemented carbide and cermet inserts**

TN ☐ ☐ (Negative inserts)



😊 Good working condition 😐 Normal working condition 😞 Bad working condition

[illegible]

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																	Cermat	Coated cermat	Cemented carbide							
		L	ØI.C	S	ød	r	YBC151	YBC152	YBC251	YBC252	YBC351	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBM151	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YBD252	YNG151	YNG151C	YD101	YD201	
	TNMM160404	16.5	9.525	4.76	3.81	0.4		○																									
	TNMM160408	16.5	9.525	4.76	3.81	0.8				○																							
	TNMM160412	16.5	9.525	4.76	3.81	1.2	○	○																									
	TNMM220408	22	12.7	4.76	5.16	0.8		○																									
	TNMM220412	22	12.7	4.76	5.16	1.2		●	○												○												
	TNMM220416	22	12.7	4.76	5.16	1.6				○																							
	TNMM270616	27.5	15.875	6.35	6.35	1.6		●	○																								
	TNMA160404	16.5	9.525	4.76	3.81	0.4																			○ ★ ★								
	TNMA160408	16.5	9.525	4.76	3.81	0.8	○																		★ ★ ★							○	
	TNMA160412	16.5	9.525	4.76	3.81	1.2																			★ ○ ○								
	TNMA160416	16.5	9.525	4.76	3.81	1.6																			○ ○ ○								
	TNMA220404	22	12.7	4.76	5.16	0.4																			○ ○ ○								
	TNMA220408	22	12.7	4.76	5.16	0.8																			○ ○ ○								
	TNMA270616	27.5	15.875	6.35	6.35	1.6																					○						

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

Applicable tool



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A180



A181



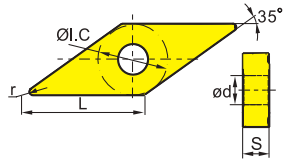
A182



A216



VN (Negative inserts)



😊 Good working condition 😐 Normal working condition 😞 Bad working condition

							P Steel																										
Inserts shape		Type	Dimensions(mm)					Coated cemented carbide																Cermet	Coated cermet	Cemented carbide							
			L	ØI.C	S	ød	r	YBC151	YBC152	YBC251	YBC252	YBC351	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBM151	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YBD252	YNG151	YNG151C	YD101	YD201
 For finishing	DF	VNMG160404-DF	16.6	9.525	4.76	3.81	0.4	★	●	★													●										
		VNMG160408-DF	16.6	9.525	4.76	3.81	0.8	★	○	○																							
 For finishing	EF	VNMG160404-EF	16.6	9.525	4.76	3.81	0.4								○	★				★	★												
		VNMG160408-EF	16.6	9.525	4.76	3.81	0.8								○	★				★	★												
		VNMG160412-EF	16.6	9.525	4.76	3.81	1.2								○	★				★	○												
 For finishing	NF	VNEG160404-NF	16.6	9.525	4.76	3.81	0.4						○	★																			○
		VNEG160408-NF	16.6	9.525	4.76	3.81	0.8						○	★																			○
 For finishing	NGF	VNEG160408-NGF	16.6	9.525	4.76	3.81	0.8						○	●			○																
		VNEG160412-NGF	16.6	9.525	4.76	3.81	1.2						○	●			○																
 For finishing	SF	VNMG160404-SF	16.6	9.525	4.76	3.81	0.4						○																	○	★		
		VNMG160408-SF	16.6	9.525	4.76	3.81	0.8						○																	○			

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

Applicable tool

DVVNN
Kr:72°30'



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DVJNR/L
Kr:93°



A170

Insert code key

A50-A51

Grade selection reference

A19/A36-A48

Chipbreaker selection reference

A22-A35

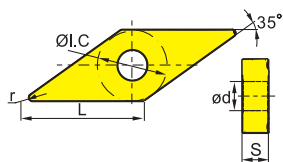
Recommended cutting parameters

A241-A244

TURNING / General Turning Inserts

- **Cemented carbide and cermet inserts**

VN ☐ ☐ (Negative inserts)



😊 Good working condition 😐 Normal working condition 😞 Bad working condition

[illegible]

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																		Cermet	Coated cermet	Cemented carbide						
		L	ØI.C	S	ød	r	YBC151	YBC152	YBC251	YBC252	YBC351	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBM151	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YBD252	YNG151	YNG151C	YD101	YD201	
 PM For semi-finishing	VNMG160404-PM	16.6	9.525	4.76	3.81	0.4	★	●	○	○																	○	○					
	VNMG160408-PM	16.6	9.525	4.76	3.81	0.8	★	●	○																	★	★	○					
	VNMG160412-PM	16.6	9.525	4.76	3.81	1.2			○	○																	○	○					
 DM For semi-finishing	VNMG160408-DM	16.6	9.525	4.76	3.81	0.8	★	●	★	○												○											
	VNMG160412-DM	16.6	9.525	4.76	3.81	1.2	○	○	○													○											
 EM For semi-finishing	VNMG160404-EM	16.6	9.525	4.76	3.81	0.4								●	★						★		★										
	VNMG160408-EM	16.6	9.525	4.76	3.81	0.8								●	★						★		★										
 NM For semi-finishing	VNMG160412-NM	16.6	9.525	4.76	3.81	1.2							○	★										○								○	
 SNR For roughing	VNMG160408-SNR	16.6	9.525	4.76	3.81	0.8							○	●		○								●									
	VNMG160412-SNR	16.6	9.525	4.76	3.81	1.2							○	●		○									●								
 All round	VNMG160404	16.6	9.525	4.76	3.81	0.4	○	○																									
	VNMG160408	16.6	9.525	4.76	3.81	0.8	●	●																									

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

Applicable tool

DVVNN
Kr:72°30'



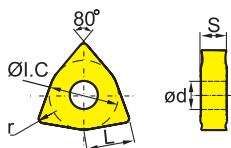
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DVJNR/L
Kr:93°



A170

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

[illegible]

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermet	Coated Cermet	Cemented carbide							
		L	ØI.C	S	ød	r	YBC151	YBC152	YBC251	YBC252	YBC351	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBM151	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YBD252	YNG151	YNG151C	YD101	YD201
 DF For finishing	WNMG06T304-DF	6.5	9.525	3.97	3.81	0.4	★																									
	WNMG06T308-DF	6.5	9.525	3.97	3.81	0.8	★		★																							
	WNMG06T312-DF	6.5	9.525	3.97	3.81	1.2	★		★																							
	WNMG060404-DF	6.5	9.525	4.76	3.81	0.4	★	●	★													○										
	WNMG060408-DF	6.5	9.525	4.76	3.81	0.8	★	●	★													●										
	WNMG060412-DF	6.5	9.525	4.76	3.81	1.2	★	●	○													○										
	WNMG080404-DF	8.7	12.7	4.76	5.16	0.4	★	●	○													○										
	WNMG080408-DF	8.7	12.7	4.76	5.16	0.8	★	●	★													●										
	WNMG080412-DF	8.7	12.7	4.76	5.16	1.2	○	○	○																							
 WGF For finishing Wiper	WNMG060404-WGF	6.5	9.525	4.76	3.81	0.4	★													★					★							
	WNMG060408-WGF	6.5	9.525	4.76	3.81	0.8	★														★					★						
	WNMG080404-WGF	8.7	12.7	4.76	5.16	0.4	★														★					★						
	WNMG080408-WGF	8.7	12.7	4.76	5.16	0.8	★														★					★						
 SF For finishing	WNMG06T304-SF	6.5	9.525	3.97	3.81	0.4							○															○	★			
	WNMG06T308-SF	6.5	9.525	3.97	3.81	0.8							○															○				
	WNMG06T312-SF	6.5	9.525	3.97	3.81	1.2							○															○				
	WNMG060404-SF	6.5	9.525	4.76	3.81	0.4							○															○	★			
	WNMG060408-SF	6.5	9.525	4.76	3.81	0.8							○															○	★			
	WNMG080404-SF	8.7	12.7	4.76	5.16	0.4							○															○	★			
	WNMG080408-SF	8.7	12.7	4.76	5.16	0.8							○															○	★			
	WNMG080412-SF	8.7	12.7	4.76	5.16	1.2							○															○				

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

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A183

A217

Insert code key

A50–A51

Grade selection reference

A19/A36–A48

Chipbreaker selection reference

A22–A35

Recommended cutting parameters

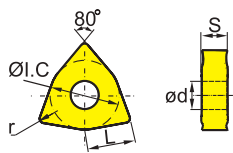
A241–A244

TURNING / General Turning Inserts

- **Cemented carbide and cermet inserts**

WN ☐ ☐ (Negative 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

General turning

Cemented carbide and cermet inserts

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																	Cermet	Coated cermet	Cemented carbide						
		L	ØI.C	S	ød	r	YBC151	YBC152	YBC251	YBC252	YBC351	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBM151	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YBD252	YNG151	YNG151C	YD101	YD201
 For finishing	WNMG06T304-EF	6.5	9.525	3.97	3.81	0.4								○ ★					★	○												
	WNMG06T308-EF	6.5	9.525	3.97	3.81	0.8								○ ★					★	○												
	WNMG06T312-EF	6.5	9.525	3.97	3.81	1.2								○ ★					★	○												
	WNMG060404-EF	6.5	9.525	4.76	3.81	0.4								● ★					★	○												
	WNMG060408-EF	6.5	9.525	4.76	3.81	0.8								● ★					★	○												
	WNMG080404-EF	8.7	12.7	4.76	5.16	0.4							○	● ★					★ ★													
	WNMG080408-EF	8.7	12.7	4.76	5.16	0.8							○	● ★					★ ★													
 For finishing	WNEG080404-NF	8.7	12.7	4.76	5.16	0.4						○ ★																			○	
	WNEG080408-NF	8.7	12.7	4.76	5.16	0.8						○ ★																			○	
 For semi-finishing Wiper	WNMG060408-WGM	6.5	9.525	4.76	3.81	0.8			★					★													★					
	WNMG060412-WGM	6.5	9.525	4.76	3.81	1.2			★					★													★					
	WNMG080408-WGM	8.7	12.7	4.76	5.16	0.8			★					★													★					
	WNMG080412-WGM	8.7	12.7	4.76	5.16	1.2			★					★													★					

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

Applicable tool

DWLNR/L
Kr:95°



Page A171

PWLNR/L
Kr:95°

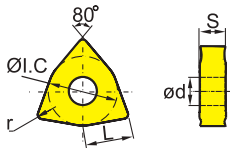


A183

PWLNR/L
Kr:95°



A217

WN (Negative inserts)
 Good working condition
  Normal working condition
  Bad working condition


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

																																																																																																																																																														
---	---	---	---	---	---	---	---	--	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	--

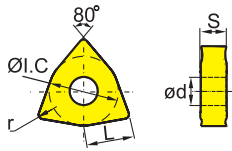
TURNING General Turning Inserts

Cemented carbide and cermet inserts

General turning

Cemented carbide and cermet inserts

WN (Negative inserts)



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

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

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermert	Coated Carbide	Cemented carbide								
		L	ØI.C	S	ød	r	YBC151	YBC152	YBC251	YBC252	YBC351	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBM151	YBM153	YBM215	YBM251			YBM253	YBS103	YBD052	YBD102	YBD152	YBD252	YNG151	YNG151C	YD101
 For semi-finishing	WNMG080408-NM	8.7	12.7	4.76	5.16	0.8							○	★											○							○	
	WNMG080412-NM	8.7	12.7	4.76	5.16	1.2							○	★											○							○	
 For roughing	WNMG060408-DR	6.5	9.525	4.76	3.81	0.8		○	○	○																○							
	WNMG060412-DR	6.5	9.525	4.76	3.81	1.2			○	○	○																○	○					
	WNMG080408-DR	8.7	12.7	4.76	5.16	0.8		○	○	★	○																●	●					
	WNMG080412-DR	8.7	12.7	4.76	5.16	1.2		○	○	★	○																	●	●				
	WNMG080416-DR	8.7	12.7	4.76	5.16	1.6				○																		○	○				
 For roughing	WNMG080408-SNR	8.7	12.7	4.76	5.16	0.8							○	●			○								●								
	WNMG080412-SNR	8.7	12.7	4.76	5.16	1.2							○	●			○								●								
 Without chipbreaker	WNMA06T308	6.5	9.525	3.97	3.81	0.8																				○							
	WNMA060404	6.5	9.525	4.76	3.81	0.4																						○					
	WNMA060408	6.5	9.525	4.76	3.81	0.8																				★	○	○					
	WNMA060412	6.5	9.525	4.76	3.81	1.2																						○					
	WNMA080404	8.7	12.7	4.76	5.16	0.4																						○					
	WNMA080408	8.7	12.7	4.76	5.16	0.8																							○				
	WNMA080412	8.7	12.7	4.76	5.16	1.2																							○				
	WNMA080416	8.7	12.7	4.76	5.16	1.6																								○			

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

Applicable tool

DWLN/L
Kr:95°



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PWLN/L
Kr:95°



A183

PWLN/L
Kr:95°



A217

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

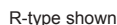


Figure 10 is a heatmap illustrating the distribution of emotion categories across five material types and three working conditions. The materials are Steel, Stainless steel, Cast iron, Non-ferrous metal, and Heat resistant alloy, Ti alloy. The working conditions are Good working condition, Normal working condition, and Bad working condition. The emotions are represented by icons: 😊 (Happy), 😐 (Neutral), 😞 (Sad), 😡 (Angry), 😬 (Disgust), 😓 (Annoyed), 😫 (Stressed), 😩 (Tired), 😭 (Crying), 😏 (Smug), 😇 (Grateful), 😊 (Happy), 😐 (Neutral), 😞 (Sad), 😡 (Angry), 😬 (Disgust), 😓 (Annoyed), 😫 (Stressed), 😩 (Tired), 😭 (Crying), 😏 (Smug), 😇 (Grateful).

[illegible]

Chipbreaker code: 11→Declining chipbreaker 12→Straight chipbreaker

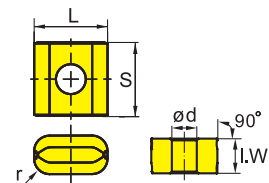


TURNING / General Turning Inserts

- **Cemented carbide and cermet inserts**

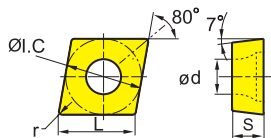
Heavy turning(Negative inserts)

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

[illegible][illegible]

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

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

[illegible]

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

SCACR/L Kr:90° Page A184	SCLCR/L Kr:95° A185	SCLCR/L Kr:95° A218	SCFCR/L Kr:90° A232	SCLCR/L Kr:95° A233
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Page A184

A185

A218

A232

A233

Insert code key

A50–A51

Grade selection reference

A19/A36–A48

Chipbreaker selection reference

A22–A35

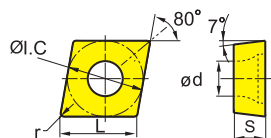
Recommended cutting parameters

A241–A244

- **Cemented carbide and cermet inserts**

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

Cemented carbide and cermet inserts



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

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																	Cermet	Coated cermet	Cemented carbide							
		L	ØI.C	S	ød	r	YBC151	YBC152	YBC251	YBC252	YBC351	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBM151	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YBD252	YNG151	YNG151C	YD101	YD201	
 For finishing	CCMT060202-EF	6.4	6.35	2.38	2.8	0.2						○		● ★					★ ○														
	CCMT060204-EF	6.4	6.35	2.38	2.8	0.4						○		● ★					★ ○														
	CCMT09T302-EF	9.7	9.525	3.97	4.4	0.2						○		● ★					★ ○														
	CCMT09T304-EF	9.7	9.525	3.97	4.4	0.4						○		● ★					★ ★														
	CCMT09T308-EF	9.7	9.525	3.97	4.4	0.8						○		● ★					○ ★														
	CCMT120404-EF	12.9	12.7	4.76	5.56	0.4						○		● ★					★ ○														
	CCMT120408-EF	12.9	12.7	4.76	5.56	0.8						○		● ★					○ ○														
 For semi-finishing	CCMT060204-HM	6.4	6.35	2.38	2.8	0.4	★ ● ★ ○							●						●						● ●							●
	CCMT060208-HM	6.4	6.35	2.38	2.8	0.8	★ ● ○ ○							●							○					○ ●							
	CCMT09T304-HM	9.7	9.525	3.97	4.4	0.4	● ★ ● ★ ●							●							●					● ●							
	CCMT09T308-HM	9.7	9.525	3.97	4.4	0.8	★ ● ★ ●							●							●					● ●							
	CCMT120404-HM	12.9	12.7	4.76	5.56	0.4	★ ● ○ ○														○					○ ○							
	CCMT120408-HM	12.9	12.7	4.76	5.56	0.8	★ ● ★ ●							○							●					● ●							
	CCMT120412-HM	12.9	12.7	4.76	5.56	1.2	○ ○																			○							
 For semi-finishing	CCMT060204-EM	6.4	6.35	2.38	2.8	0.4								● ★						○	★												
	CCMT060208-EM	6.4	6.35	2.38	2.8	0.8								● ★						○	★												
	CCMT09T304-EM	9.7	9.525	3.97	4.4	0.4								● ★						★	★												
	CCMT09T308-EM	9.7	9.525	3.97	4.4	0.8								● ★						★	★												
	CCMT120404-EM	12.9	12.7	4.76	5.56	0.4								● ★						○	★												
	CCMT120408-EM	12.9	12.7	4.76	5.56	0.8								● ★						○	★												
	CCMT120412-EM	12.9	12.7	4.76	5.56	1.2								● ★						○	★												

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

SCACR/L
Kr:90°



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SCLCR/L
Kr:95°



A185

SCLCR/L
Kr:95°



A218

SCFCR/L
Kr:90°



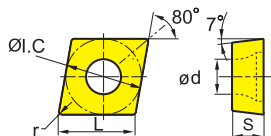
A232

SCLCR/L
Kr:95°



A233

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

[illegible]

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

SCACR/L
Kr:90°



Page A184

A184

SCLCR/L
Kr:95°



A185

A185

SCLCR/L
Kr:95°



A218

A218

SCFCR/L
Kr:90°



A232

A232

SCLCR/L
Kr:95°



A233

A233

Insert code key

A50–A51

Grade selection reference

A19/A36–A48

Chipbreaker selection reference

A22–A35

Recommended cutting parameters

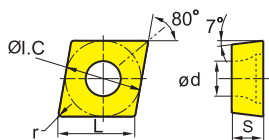
A241–A244

TURNING / General Turning Inserts

- **Cemented carbide and cermet inserts**

CC (Positive inserts)

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

[illegible][illegible]

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

Applicable tool



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A218

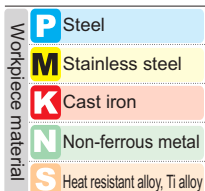


A232



A233

😊 Good working condition 😐 Normal working condition 😞 Bad working condition



Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																	Cermet	Coated cermet	Cemented carbide							
		L	ØI.C	S	ød	r	YBC151	YBC152	YBC251	YBC252	YBC351	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBM151	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YBD252	YNG151	YNG151C	YD101	YD201	
 USF For extra finishing	DCGT0702005R-USF	7.8	6.35	2.38	2.8	0.05								●	○																		
	DCGT070201R-USF	7.8	6.35	2.38	2.8	0.1								●	○																		
	DCGT070202R-USF	7.8	6.35	2.38	2.8	0.2								●	○																		
	DCGT11T301R-USF	11.6	9.525	3.97	4.4	0.1								○	○																		
	DCGT11T302R-USF	11.6	9.525	3.97	4.4	0.2								●	○																		
 USF For extra finishing	DCGT0702005L-USF	7.8	6.35	2.38	2.8	0.05								○	○																		
	DCGT070201L-USF	7.8	6.35	2.38	2.8	0.1								○	○																		
	DCGT070202L-USF	7.8	6.35	2.38	2.8	0.2								●	○																		
	DCGT11T301L-USF	11.6	9.525	3.97	4.4	0.1								○	○																		
	DCGT11T302L-USF	11.6	9.525	3.97	4.4	0.2								●	○																		
 SF For extra finishing	DCGT070202-SF	7.8	6.35	2.38	2.8	0.2						○																		○			
	DCGT070204-SF	7.8	6.35	2.38	2.8	0.4						○																		○			
	DCGT070208-SF	7.8	6.35	2.38	2.8	0.8						○																					
	DCGT11T302-SF	11.6	9.525	3.97	4.4	0.2						○																		○	○		
	DCGT11T304-SF	11.6	9.525	3.97	4.4	0.4						○																			★		
	DCGT11T308-SF	11.6	9.525	3.97	4.4	0.8						○																		○	○		
 HF For finishing	DCMT070202-HF	7.8	6.35	2.38	2.8	0.2	★	●	○					○																○			
	DCMT070204-HF	7.8	6.35	2.38	2.8	0.4	★	●	★	○				●													○			○		●	
	DCMT070208-HF	7.8	6.35	2.38	2.8	0.8		○	○		○																						
	DCMT11T302-HF	11.6	9.525	3.97	4.4	0.2	★	●	○					●																○			○
	DCMT11T304-HF	11.6	9.525	3.97	4.4	0.4	★	●	★	○				●													○	○		●			○
	DCMT11T308-HF	11.6	9.525	3.97	4.4	0.8	★	●	○					○																○			

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

SDACR/L
Kr:90°

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A188



A219



A220



A221

A50–A51

A19/A36–A48

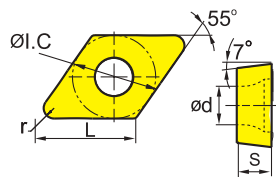
A22–A35

A241–A244

TURNING / General Turning Inserts

- **Cemented carbide and cermet inserts**

DC ☐ ☐ (Positive inserts)



😊 Good working condition 😐 Normal working condition 😞 Bad working condition

[illegible][illegible]

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

Applicable tool

SDACR/L
Kr:90°

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SDJCR/L
Kr:93°

A187

SDNCN
Kr:62°30'

A188

SDQCR/L
Kr:107°30'

A219

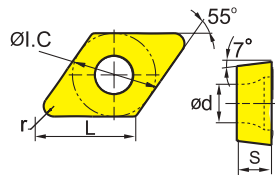
SDUCR/L
Kr:93°



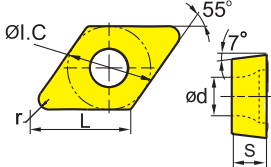
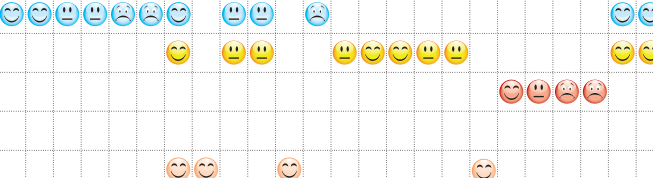
A220

SDZCR/L
Kr:95°

A221


DC (Positive inserts)


😊 Good working condition 😐 Normal working condition 😞 Bad working condition

							P Steel																									
Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermet	Coated cermet	Cemented carbide							
		L	ØI.C	S	ød	r	YBC151	YBC152	YBC251	YBC252	YBC351	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBM151	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YBD252	YNG151	YNG151C	YD101	YD201
 For roughing	DCMT11T304-HR	11.6	9.525	3.97	4.4	0.4	○	●	○	○												○				○	●					
	DCMT11T308-HR	11.6	9.525	3.97	4.4	0.8	●	●	★	○												○			○	●	●					
	DCMT11T312-HR	11.6	9.525	3.97	4.4	1.2	○	●																								
 For Al machining	DCGX070201-LC	7.8	6.35	2.38	2.8	0.1																									★	
	DCGX070202-LC	7.8	6.35	2.38	2.8	0.2																									★	
	DCGX070204-LC	7.8	6.35	2.38	2.8	0.4																									★	
	DCGX11T304-LC	11.6	9.525	3.97	4.4	0.4																									★	
	DCGX11T308-LC	11.6	9.525	3.97	4.4	0.8																									★	
 For Al machining	DCGX070202-LH	7.8	6.35	2.38	2.8	0.2																									★	
	DCGX070204-LH	7.8	6.35	2.38	2.8	0.4																									★	○
	DCGX11T302-LH	11.6	9.525	3.97	4.4	0.2																									★	○
	DCGX11T304-LH	11.6	9.525	3.97	4.4	0.4																									★	●
	DCGX11T308-LH	11.6	9.525	3.97	4.4	0.8																									★	
Without chipbreaker 	DCMW070204	7.8	6.35	2.38	2.8	0.4																				○						
	DCMW11T304	11.6	9.525	3.97	4.4	0.4																									●	
	DCMW11T308	11.6	9.525	3.97	4.4	0.8																									●	

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

Applicable tool

SDACR/L
Kr:90°


Page A186

SDJCR/L
Kr:93°


A187

SDNCN
Kr:62°30'


A188

SDQCR/L
Kr:107°30'


A219

SDUCR/L
Kr:93°


A220

SDZCR/L
Kr:95°


A221

Insert code key

A50-A51

Grade selection reference

A19/A36-A48

Chipbreaker selection reference

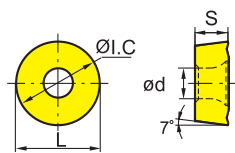
A22-A35

Recommended cutting parameters

A241-A244

TURNING / General Turning Inserts

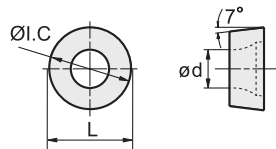
- **Cemented carbide and cermet inserts**

RC ☐ ☐ (Positive inserts)

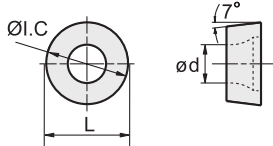
😊 Good working condition 😐 Normal working condition 😞 Bad working condition

[illegible]

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



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

		Workpiece material		<table><tr><td>P</td><td>Steel</td><td>😊😊</td></tr></table>																												P	Steel	😊😊
P	Steel	😊😊																																

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

Applicable tool

SRDCN

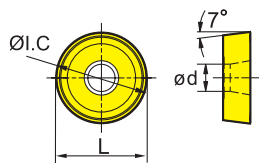
Page A202

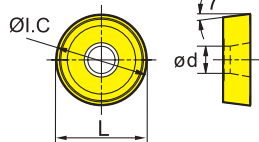
SRGCR/L

A203

General turning

😊 Good working condition 😐 Normal working condition 😞 Bad working condition



		Workpiece material				Material compatibility icons																										
		P Steel	M Stainless steel	K Cast iron	N Non-ferrous metal	S Heat resistant alloy, Ti alloy																										
Inserts shape	Type	Dimensions(mm)				Coated cemented carbide																Coated cement carbide	Cemented carbide									
		L	ØI.C	S	ød	YBC151	YBC152	YBC251	YBC252	YBC351	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBM151	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YBD252	YNG151	YNG151C	YD101	YD201	
	RCMX0803MO	8.0	8.0	3.18	3.36		●		○															○							○	
	RCMX1003MO	10	10	3.18	3.6	●	●	●																							○	
	RCMX1204MO	12	12	4.76	4.4	○	●																								○	●
	RCMX1606MO	16	16	6.35	5.5	●	●		○																						○	
	RCMX2006MO	20	20	6.35	6.5	○	★	●	○	○																		★			○	●
	RCMX2507MO	25	25	7.94	7.2		★	●	○	○																○						
	RCMX3209MO	32	32	9.52	9.5	○	○	●	○	○															●							

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

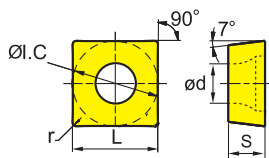
Cemented carbide and cermet inserts

TURNING / General Turning Inserts

- **Cemented carbide and cermet inserts**

SC ☐ ☐ (Positive inserts)

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

[illegible][illegible]

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

Applicable tool



Page A194



A195



A196



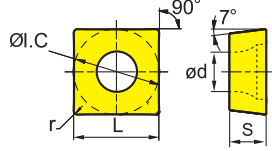
A197



A222



SC (Positive inserts)



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

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																	Cermat	Coated cermet	Cemented carbide						
		L	ØI.C	S	ød	r	YBC151	YBC152	YBC251	YBC252	YBC351	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBM151	YBM153	YBM215	YBM251	YBM253				YBS103	YBD052	YBD102	YBD152	YBD252	YNG151
 For Al machining	LC	SCGX09T304-LC	9.525	9.525	3.97	4.4	0.4																									★
		SCGX09T308-LC	9.525	9.525	3.97	4.4	0.8																								★	
		SCGX120408-LC	12.7	12.7	4.76	5.5	0.8																								★	
 For Al machining	LH	SCGX09T302-LH	9.525	9.525	3.97	4.4	0.2																								○	
		SCGX09T304-LH	9.525	9.525	3.97	4.4	0.4																								○	
		SCGX09T308-LH	9.525	9.525	3.97	4.4	0.8																								★	
		SCGX120404-LH	12.7	12.7	4.76	5.56	0.4																								○	
		SCGX120408-LH	12.7	12.7	4.76	5.56	0.8																								★	
 For roughing	HR	SCMT09T304-HR	9.525	9.525	3.97	4.4	0.4	★	●		●				●													○				
		SCMT09T308-HR	9.525	9.525	3.97	4.4	0.8	★	○		●																●	●				
		SCMT09T312-HR	9.525	9.525	3.97	4.4	1.2	★																								
		SCMT120404-HR	12.7	12.7	4.76	5.56	0.4		○	●		○																				
		SCMT120408-HR	12.7	12.7	4.76	5.56	0.8	★	●	○	●				○											○	●	●				
		SCMT120412-HR	12.7	12.7	4.76	5.56	1.2		○	○		●															○	○				
	All round	SCMT09T304	9.525	9.525	3.97	4.4	0.4	○	●																							
		SCMT120404	12.7	12.7	4.76	5.56	0.4			○	○																					
		SCMT120408	12.7	12.7	4.76	5.56	0.8	○	●																			○				
	Without chipbreaker	SCMW060204	6.35	6.35	2.38	2.8	0.4																							○		
		SCMW09T304	9.525	9.525	3.97	4.4	0.4																						○			
		SCMW09T308	9.525	9.525	3.97	4.4	0.8	○																								
		SCMW120408	12.7	12.7	4.76	5.56	0.8	●																								

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

Applicable tool

SSBCR/L
Kr:75°

Page A194

SSDCN
Kr:45°

A195

SSKCR/L
Kr:75°

A196

SSSCR/L
Kr:45°

A197

SSKCR/L
Kr:75°

A222

Insert code key

A50-A51

Grade selection reference

A19/A36-A48

Chipbreaker selection reference

A22-A35

Recommended cutting parameters

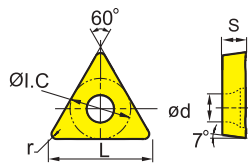
A241-A244

TURNING / General Turning Inserts

- **Cemented carbide and cermet inserts**

TC ☐ ☐ (Positive inserts)

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

[illegible][illegible]

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

Applicable tool

STACR/L
Kr:90°



Page A198

STFCR/L
Kr:90°



A198

STGCR/L
Kr:91°



A199

STECR/L
Kr:60°



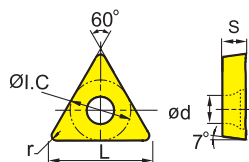
A200

STFCR/L
Kr:90°



A223

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

[illegible]

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

STACR/L
Kr:90°



Page A198

STFCR/L
Kr:90°



A198

STGCR/L
Kr:91°



A199

STECR/L
Kr:60°



A200

STFCR/L
Kr:90°



A223

Insert code key

A50–A51

Grade selection reference

A19/A36–A48

Chipbreaker selection reference

A22–A35

Recommended cutting parameters

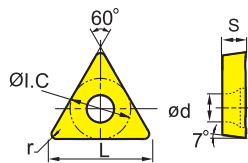
A241–A244

TURNING / General Turning Inserts

- **Cemented carbide and cermet inserts**

TC ☐ ☐ (Positive inserts)

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

[illegible][illegible]

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

Applicable tool



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A198



A199

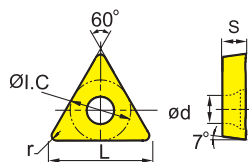


A200



A223

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

[illegible]

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

STACR/L Kr:90°	STFCR/L Kr:90°	STGCR/L Kr:91°	STECR/L Kr:60°	STFCR/L Kr:90°
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A223

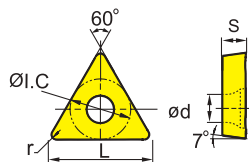
Recommended cutting parameters **A241-A244**

TURNING / General Turning Inserts

- **Cemented carbide and cermet inserts**

TC ☐ ☐ (Positive inserts)

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

[illegible]

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermel	Coated cermet	Cemented carbide							
		L	ØI.C	S	ød	r	YBC151	YBC152	YBC251	YBC252	YBC351	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBM151	YBM153	YBM215	YBM251			YBM253	YBS103	YBD052	YBD102	YBD152	YBD252	YNG151	YNG151C
 LH For AI machining	TCGX090202-LH	9.6	5.56	2.38	2.5	0.2																									★	
	TCGX090204-LH	9.6	5.56	2.38	2.5	0.4																									★	
	TCGX110202-LH	11	6.35	2.38	2.8	0.2																									★	
	TCGX110204-LH	11	6.35	2.38	2.8	0.4																									★	
	TCGX110208-LH	11	6.35	2.38	2.8	0.8																									★	
	TCGX16T302-LH	16.5	9.525	3.97	4.4	0.2																									○	
	TCGX16T304-LH	16.5	9.525	3.97	4.4	0.4																									★	
	TCGX16T308-LH	16.5	9.525	3.97	4.4	0.8																									★	
 All round	TCMT220408	22	12.7	4.76	5.5	0.8	○	●																							○	
 Without chipbreaker	TCMW110204	11	6.35	2.38	2.8	0.4																								●	○	
	TCMW16T304	16.5	9.525	3.97	4.4	0.4	○																								○	
	TCMW16T308	16.5	9.525	3.97	4.4	0.8										○										○	○					
	TCMW16T312	16.5	9.525	3.97	4.4	1.2	○									○																
	TCMW220408	22	12.7	4.76	5.5	0.8	○																					○				

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

Applicable tool



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A198



A199

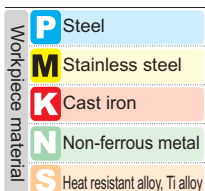


A200



A223

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

[illegible]

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

A193

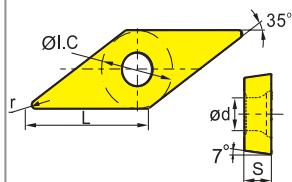
Recommended cutting parameters

A241–A244

TURNING / General Turning Inserts

- **Cemented carbide and cermet inserts**

VC ☐ ☐ (Positive inserts)



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

[illegible][illegible]

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

Applicable tool

SVQCR/L
Kr:107°30'

Page A224

SVUCR/L
Kr:93°

A225

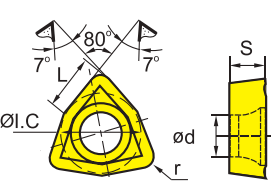
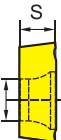
SVVCN
Kr:72°30'

A192

SVJCR/L
Kr:93°

A193

WC (Positive inserts)
 Good working condition
  Normal working condition
  Bad working condition

				Workpiece material		P	Steel	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️	☹️
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★ Recommended grade (always stock available) ● Available grade (always stock available) ○ Make-to-order

General turning

Cemented carbide and cermet inserts

Applicable tool

SWACR/L
Kr:90°

Page A201

Insert code key

A50-A51

Grade selection reference

A19/A36-A48

Chipbreaker selection reference

A22-A35

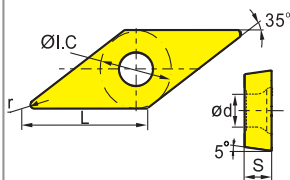
Recommended cutting parameters

A241-A244

A107

TURNING / General Turning Inserts

- **Cemented carbide and cermet inserts**

VB ☐ ☐ (Positive inserts)

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

[illegible][illegible]

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

Applicable tool



Page A189



A190



A191



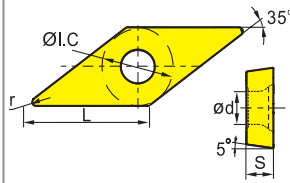
A226



A227



VB (Positive 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																										
Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																		Cermet	Coated cermet	Cemented carbide						
		L	ØI.C	S	ød	r	YBC151	YBC152	YBC251	YBC252	YBC351	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBM151	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YBD252	YNG151	YNG151C	YD101	YD201	
 For semi-finishing	EM VBMT110304-EM	11	6.35	3.18	2.8	0.4									●	★					○	★											
	VBMT110308-EM	11	6.35	3.18	2.8	0.8									●	★					○	★											
 For semi-finishing	HM VBMT160404-HM	16.5	9.525	4.76	4.4	0.4	★	●	★	●				●							●					●							○
	VBMT160408-HM	16.5	9.525	4.76	4.4	0.8	★	●	★	●				●							●					●	●						
	VBMT160412-HM	16.5	9.525	4.76	4.4	1.2			●						○						○						○						○
 For roughing	HR VBMT160404-HR	16.5	9.525	4.76	4.4	0.4	★	●	○	●																							
	VBMT160408-HR	16.5	9.525	4.76	4.4	0.8	○	●	○	●																	○						
	VBMT160412-HR	16.5	9.525	4.76	4.4	1.2					○																						
	VBGT160408-HR	16.5	9.525	4.76	4.4	0.8			○																								
 For roughing	SNR VBMT160408-SNR	16.5	9.525	4.76	4.4	0.8							○	●			○						●										
	VBMT160412-SNR	16.5	9.525	4.76	4.4	1.2							○	●			○							○									

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

Applicable tool

SVJBR/L
Kr:93°

Page A189

SVABR/L
Kr:90°

A190

SVVBN
Kr:72°30'

A191

SVQBR/L
Kr:107°30'

A226

SVUBR/L
Kr:93°

A227

Insert code key

A50-A51

Grade selection reference

A19/A36-A48

Chipbreaker selection reference

A22-A35

Recommended cutting parameters

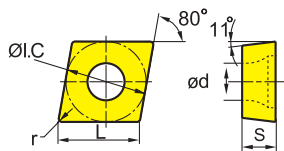
A241-A244

General Turning Inserts

- **Cemented carbide and cermet inserts**

CP ☐ ☐ (Positive inserts)

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

[illegible]

Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																		Cermat	Coated cermet	Cemented carbide				
		L	ØI.C	S	ød	r	YBC151	YBC152	YBC251	YBC252	YBC351	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBM151	YBM153	YBM215	YBM251	YBM253	YBS103				YBD052	YBD102	YBD152	YBD252
SF  For extra finishing	CPGT060202-SF	6.4	6.35	2.38	2.8	0.2						○																	○		
	CPGT060204-SF	6.4	6.35	2.38	2.8	0.4						○																	○		
	CPGT09T304-SF	9.7	9.525	3.97	4.4	0.4						○																	○	○	

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

Applicable tool

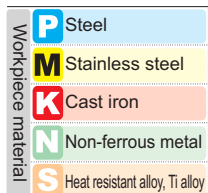
SCLPR/L
Kr:95°



Page A228

General turning

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

[illegible]

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

SDQPR/L
Kr: 107°30'

SDUPR/L
Kr:93°

A230

A50–A51

A19/A36–A48

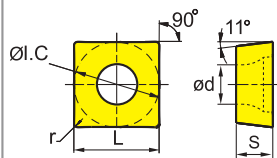
A22–A35

A241–A244

TURNING / General Turning Inserts

- **Cemented carbide and cermet inserts**

SP ☐ ☐ (Positive inserts)

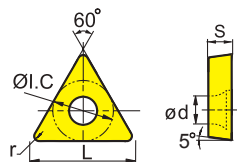


😊 Good working condition 😐 Normal working condition 😞 Bad working condition

[illegible]

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

TB ☐ ☐ (Positive inserts)



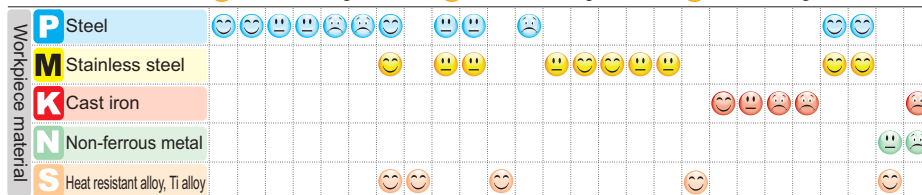
😊 Good working condition 😐 Normal working condition 😞 Bad working condition

[illegible]

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

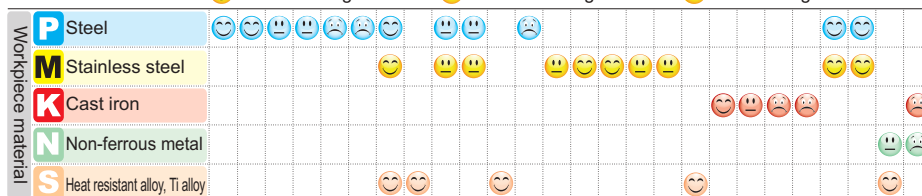
General turning

😊 Good working condition 😐 Normal working condition 😞 Bad working condition



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

😊 Good working condition 😐 Normal working condition 😞 Bad working condition



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

STUPR/L
Kr:93°

Insert code key

Grade selection reference

Chipbreaker selection reference

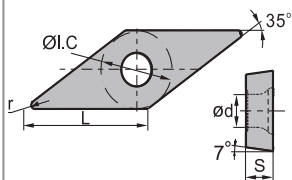
Recommended cutting parameters

A241–A244

TURNING / General Turning Inserts

■ Cemented carbide and cermet inserts

VP ☐ ☐ (Positive inserts)



😊 Good working condition 😐 Normal working condition 😞 Bad working condition

[illegible][illegible]

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





PCBN&PCD Insert



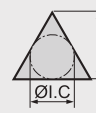
TURNING General Turning Inserts

PCBN&PCD inserts code key

General
turning

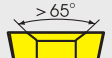
PCBN&PCD inserts code key

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

Tolerance class			
  			
Code	Nose height M Tolerance(mm)	Inscribed circle 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
Code	Nose height M Tolerance(mm)	Inscribed circle Tolerance(mm)	Thickness S Tolerance(mm)
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

C N G A 12

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

Chipbreaker and clamping system		
Code	With/ Without hole	Section plane of insert
N	Without	
B	With	 >65°
C	With	 >65°
A	With	
W	With	 ≤65°
Q	With	 ≤65°
X	---	Special

Length of cutting edge							
Diameter of IC (mm)	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				



Insert thickness			
Thickness is defined as height from bottom of insert to the highest part of cutting edge.			
Code	Insert thickness(mm)	Code	Insert thickness(mm)
02	2.38	06	6.35
T2	2.58	T6	6.75
03	3.18	07	7.94
T3	3.97	09	9.52
04	4.76	T9	9.72
T4	4.96	11	11.11
05	5.56	12	12.70
T5	5.95		

Nose radius code	
Code	Nose radius(mm)
00	No radius
02	0.2
04	0.4
08	0.8
12	1.2
16	1.6
20	2.0
24	2.4
32	3.2
X	Others
Diameter of insert (Metric)	
Round insert	

Type of cutting edge		
Code	Type of cutting edge	Picture
E	Honing	
T	Chamfering	
S	Chamfering + honing	
F	Sharp edges	

04 04 A T 010 20 - 2 S

Insert Structure		
Code	Type of cutting edge	Diagram
A	Single-sided insert	
B	Intact insert	
C	penetration insert	
D	Double-sided insert	

Chamfer width	
Code	Dimensions (mm)
000	--
008	0.08
012	0.12
017	0.17
022	0.22

Chamfer angle	
Code	Angle (°)
00	--
10	10
15	15
20	20
25	25

Cutting edge number	
Code	number
/	number1
2	number2
3	number3
4	number4
6	number6

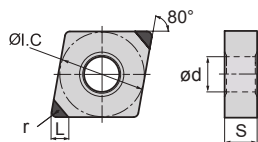
The length of cutting edge			
	Standard	Elongate	Overlength
Code	Omission	S	SS
Length	Standard	+1mm	+2mm



General Turning Inserts

PCBN&PCD inserts

CN (Negative angle)



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

Workpiece material	K Cast iron	S Heat resistant alloy, Ti alloy	H Super hard material	N Non ferrous metal
	😊😊😊😊	😊😊😊😊	😊😊😊😊	😊😊😊😊

Type	Shape of insert	Model	Specifi- cation	Dimension(mm)					Cast iron				Hardened steel					Powder alloy& Superalloy		
				Ø1.C	S	ød	r	L	BK1011	BK1021	BK2511	BK2541	BH0121	BH1020	BH2011	BH2511	BH3511	BS1011	BS2011	BS3011
Single-sided insert		CNGA120404AE-2	AE	12.7	4.76	5.156	0.4	2.5	○	○								○	○	○
		CNGA120408AE-2		12.7	4.76	5.156	0.8	2.4	○	○								○	○	○
		CNGA120412AE-2		12.7	4.76	5.156	1.2	2.3	○	○								○	○	○
		CNGA120404AS01225-2	S01225	12.7	4.76	5.156	0.4	2.5	○	○			○	○	○	○	○	○	○	○
		CNGA120408AS01225-2		12.7	4.76	5.156	0.8	2.4	○	○			○	○	○	○	○	○	○	○
		CNGA120412AS01225-2		12.7	4.76	5.156	1.2	2.3	○	○			○	○	○	○	○	○	○	○
		CNGA120404AS00815-2	S00815	12.7	4.76	5.156	0.4	2.5					○	○	○					
		CNGA120408AS00815-2		12.7	4.76	5.156	0.8	2.4					○	○	○					
		CNGA120412AS00815-2		12.7	4.76	5.156	1.2	2.3					○	○	○					
		CNGA 120404AS01735-2	S01735	12.7	4.76	5.156	0.4	2.5						○	○	○				
		CNGA120408AS01735-2		12.7	4.76	5.156	0.8	2.4						○	○	○				
		CNGA120412AS01735-2		12.7	4.76	5.156	1.2	2.3						○	○	○				
		CNGA120404AT01215-2	T01215	12.7	4.76	5.156	0.4	2.5	○	○								○	○	○
		CNGA120408AT01215-2		12.7	4.76	5.156	0.8	2.4	○	○								○	○	○
		CNGA120412AT01215-2		12.7	4.76	5.156	1.2	2.3	○	○								○	○	○
Double-sided insert		CNGA120404DE-4	DE	12.7	4.76	5.156	0.4	2.5	○	○								○	○	○
		CNGA120408DE-4		12.7	4.76	5.156	0.8	2.4	○	○								○	○	○
		CNGA120412DE-4		12.7	4.76	5.156	1.2	2.3	○	○								○	○	○
		CNGA120404DT01215-4	T01215	12.7	4.76	5.156	0.4	2.5	★	★								★	★	★
		CNGA120408DT01215-4		12.7	4.76	5.156	0.8	2.4	★	★								★	★	★
		CNGA120412DT01215-4		12.7	4.76	5.156	1.2	2.3	★	★								★	★	★

According to processing requirements, the size and number of non-standard tool nose arcs can be provided.

When using PCBN blades, please try to keep the cutting depth below 0.5mm.

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

Applicable tool

DCLNR/L
Kr:95°



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PCLNR/L
Kr:95°

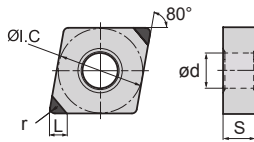


A173

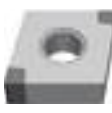
PCLNR/L
Kr:95°



A212


CN  (Negative angle)

 Good working condition
  Normal working condition
  Bad working condition

Workpiece material	K Cast iron																		
	S Heat resistant alloy, Ti alloy																		
	H Super hard material																		
	N Non ferrous metal																		

Type	Shape of insert	Model	Specifi- cation	Dimension(mm)					Cast iron				Hardened steel					Powder alloy& Superalloy		
				Øl.C	S	ød	r	L	BK1011	BK1021	BK2511	BK2541	BH0121	BH1020	BH2011	BH2511	BH3511	BS1011	BS2011	BS3011
Double-sided insert		CNGA120404DS01225-4	S01225	12.7	4.76	5.156	0.4	2.5	○	○										
		CNGA120408DS01225-4		12.7	4.76	5.156	0.8	2.4	○	○										
		CNGA120412DS01225-4		12.7	4.76	5.156	1.2	2.3	○	○										
		CNGA120404DS00815-4	S00815	12.7	4.76	5.156	0.4	2.5					★	★	○					
		CNGA120408DS00815-4		12.7	4.76	5.156	0.8	2.4					★	★	○					
		CNGA120412DS00815-4		12.7	4.76	5.156	1.2	2.3					★	★	○					
		CNGA120404DS01225-4	S01225	12.7	4.76	5.156	0.4	2.5					★	★	★	★	★	○	○	○
		CNGA120408DS01225-4		12.7	4.76	5.156	0.8	2.4					★	★	★	★	★	○	○	○
		CNGA120412DS01225-4		12.7	4.76	5.156	1.2	2.3					★	★	★	★	★	○	○	○
		CNGA120404DS01735-4	S01735	12.7	4.76	5.156	0.4	2.5							○	★	○			
		CNGA120408DS01735-4		12.7	4.76	5.156	0.8	2.4							○	★	○			
		CNGA120412DS01735-4		12.7	4.76	5.156	1.2	2.3							○	★	○			
Penetration insert		CNGA120404CE-2	CE	12.7	4.76	5.156	0.4	2.5		○										
		CNGA120408CE-2		12.7	4.76	5.156	0.8	2.4		○										
		CNGA120412CE-2		12.7	4.76	5.156	1.2	2.3		○										
		CNGA120404CT01215-2	T01215	12.7	4.76	5.156	0.4	2.5		★										
		CNGA120408CT01215-2		12.7	4.76	5.156	0.8	2.4		★										
		CNGA120412CT01215-2		12.7	4.76	5.156	1.2	2.3		★										
		CNGA120404CS01225-2	S01225	12.7	4.76	5.156	0.4	2.5		○										
		CNGA120408CS01225-2		12.7	4.76	5.156	0.8	2.4		○										
		CNGA120412CS01225-2		12.7	4.76	5.156	1.2	2.3		○										

According to processing requirements, the size and number of non-standard tool nose arcs can be provided.

When using PCBN blades, please try to keep the cutting depth below 0.5mm.

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

Applicable tool

DCLNR/L
Kr:95°


Page A166

PCLNR/L
Kr:95°


A173

PCLNR/L
Kr:95°


A212

General
turning

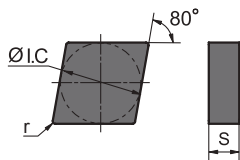
PCBN&PCD inserts



General Turning Inserts

PCBN&PCD inserts

CN (Negative angle)



😊 Good working condition 😐 Normal working condition 😞 Bad working condition

Workpiece material	K Cast iron	S Heat resistant alloy, Ti alloy	H Super hard material	N Non ferrous metal
	😊😊😊😊	😊😊😊😊	😊😊😊😊	😊😊😊😊
		😊😊😊😊	😊😊😊😊	😊😊😊😊
			😊😊😊😊	😊😊😊😊
				😊😊😊😊

Type	Shape of insert	Model	Specifi- cation	Dimension(mm)			Cast iron				Hardened steel					Powder alloy& Superalloy		
				ØI.C	S	r	BK1011	BK1021	BK2511	BK2541	BH0121	BH1020	BH2011	BH2511	BH3511	BS1011	BS2011	BS3011
Intact insert		CNGN120404BE	BE	12.7	4.76	0.4		○										
		CNGN120408BE		12.7	4.76	0.8		○										
		CNGN120412BE		12.7	4.76	1.2		○										
		CNGN120404BT01215	T01215	12.7	4.76	0.4		★										
		CNGN120408BT01215		12.7	4.76	0.8		★										
		CNGN120412BT01215		12.7	4.76	1.2		★										
		CNGN120404BS01225	S01225	12.7	4.76	0.4		○										
		CNGN120408BS01225		12.7	4.76	0.8		○										
		CNGN120412BS01225		12.7	4.76	1.2		○										

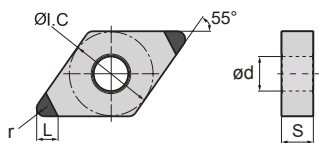
According to processing requirements, the size and number of non-standard tool nose arcs can be provided.

When using PCBN blades, please try to keep the cutting depth below. 0.5mm.

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

General turning

PCBN&PCD inserts


DN  (Negative angle)

 Good working condition
  Normal working condition
  Bad working condition

Workpiece material	K Cast iron											
	S Heat resistant alloy, Ti alloy											
	H Super hard material											
	N Non ferrous metal											

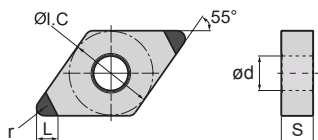
Type	Shape of insert	Model	Specifi- cation	Dimension(mm)					Cast iron				Hardened steel					Powder alloy& Superalloy			
				ØI.C	S	ød	r	L	BK1011	BK1021	BK2511	BK2541	BH0121	BH1020	BH2011	BH2511	BH3511	BS1011	BS2011	BS3011	
Single-sided insert		DNGA150404AE-2	AE	12.7	4.76	5.156	0.4	2.5	○	○								○	○	○	
		DNGA150408AE-2		12.7	4.76	5.156	0.8	2.1	○	○								○	○	○	
		DNGA150412AE-2		12.7	4.76	5.156	1.2	2.0	○	○									○	○	○
		DNGA150604AE-2		12.7	6.35	5.156	0.4	2.5	○	○									○	○	○
		DNGA150608AE-2		12.7	6.35	5.156	0.8	2.1	○	○									○	○	○
		DNGA150612AE-2		12.7	6.35	5.156	1.2	2.0	○	○									○	○	○
		DNGA150404AT01215-2	T01215	12.7	4.76	5.156	0.4	2.5	○	○									○	○	○
		DNGA150408AT01215-2		12.7	4.76	5.156	0.8	2.1	○	○									○	○	○
		DNGA150412AT01215-2		12.7	4.76	5.156	1.2	2.0	○	○									○	○	○
		DNGA150604AT01215-2		12.7	6.35	5.156	0.4	2.5	○	○									○	○	○
		DNGA150608AT01215-2		12.7	6.35	5.156	0.8	2.1	○	○									○	○	○
		DNGA150612AT01215-2		12.7	6.35	5.156	1.2	2.0	○	○									○	○	○
		DNGA150404AS01225-2	S01225	12.7	4.76	5.156	0.4	2.5	○	○			○	○	○	○	○		○	○	○
		DNGA150408AS01225-2		12.7	4.76	5.156	0.8	2.1	○	○			○	○	○	○	○		○	○	○
		DNGA150412AS01225-2		12.7	4.76	5.156	1.2	2.0	○	○			○	○	○	○	○		○	○	○
		DNGA150604AS01225-2		12.7	6.35	5.156	0.4	2.5	○	○			○	○	○	○	○		○	○	○
		DNGA150608AS01225-2		12.7	6.35	5.156	0.8	2.1	○	○			○	○	○	○	○		○	○	○
		DNGA150612AS01225-2		12.7	6.35	5.156	1.2	2.0	○	○			○	○	○	○	○		○	○	○
		DNGA150404AS00815-2	S00815	12.7	4.76	5.156	0.4	2.5					○	○	○						
		DNGA150408AS00815-2		12.7	4.76	5.156	0.8	2.1					○	○	○						
		DNGA150412AS00815-2		12.7	4.76	5.156	1.2	2.0					○	○	○						
		DNGA150604AS00815-2		12.7	6.35	5.156	0.4	2.5					○	○	○						
		DNGA150608AS00815-2		12.7	6.35	5.156	0.8	2.1					○	○	○						
DNGA150612AS00815-2	12.7	6.35	5.156	1.2	2.0					○	○	○									



General Turning Inserts

PCBN&PCD inserts

DN (Negative angle)



😊 Good working condition 😐 Normal working condition 😞 Bad working condition

Workpiece material	K Cast iron	😊	😊	😊	😊															
	S Heat resistant alloy, Ti alloy																	😊	😊	😊
	H Super hard material										😊	😊	😊	😊	😊					
	N Non ferrous metal																			

Type	Shape of insert	Model	Specifi- cation	Dimension(mm)					Cast iron				Hardened steel					Powder alloy& Superalloy		
				ØI.C	S	ød	r	L	BK1011	BK1021	BK2511	BK2541	BH0121	BH1020	BH2011	BH2511	BH3511	BS1011	BS2011	BS3011
Single-sided insert		DNGA150404AS01735-2	S01735	12.7	4.76	5.156	0.4	2.5							○	○	○			
		DNGA150408AS01735-2		12.7	4.76	5.156	0.8	2.1							○	○	○			
		DNGA150412AS01735-2		12.7	4.76	5.156	1.2	2.0							○	○	○			
		DNGA150604AS01735-2		12.7	6.35	5.156	0.4	2.5							○	○	○			
		DNGA150608AS01735-2		12.7	6.35	5.156	0.8	2.1							○	○	○			
		DNGA150612AS01735-2		12.7	6.35	5.156	1.2	2.0							○	○	○			
Double-sided insert		DNGA150404DE-4	DE	12.7	4.76	5.156	0.4	2.5	○	○								○	○	○
		DNGA150408DE-4		12.7	4.76	5.156	0.8	2.1	○	○								○	○	○
		DNGA150412DE-4		12.7	4.76	5.156	1.2	2.0	○	○								○	○	○
		DNGA150604DE-4		12.7	6.35	5.156	0.4	2.5	○	○								○	○	○
		DNGA150608DE-4		12.7	6.35	5.156	0.8	2.1	○	○								○	○	○
		DNGA150612DE-4		12.7	6.35	5.156	1.2	2.0	○	○								○	○	○
		DNGA150404DT01215-4	T01215	12.7	4.76	5.156	0.4	2.5	★	★								★	★	★
		DNGA150408DT01215-4		12.7	4.76	5.156	0.8	2.1	★	★								★	★	★
		DNGA150412DT01215-4		12.7	4.76	5.156	1.2	2.0	★	★								★	★	★
		DNGA150604DT01215-4		12.7	6.35	5.156	0.4	2.5	★	★								★	★	★
		DNGA150608DT01215-4		12.7	6.35	5.156	0.8	2.1	★	★								★	★	★
		DNGA150612DT01215-4		12.7	6.35	5.156	1.2	2.0	★	★								★	★	★

According to processing requirements, the size and number of non-standard tool nose arcs can be provided.

When using PCBN blades, please try to keep the cutting depth below 0.5mm.

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

Applicable tool

DDJNR/L
Kr:93°



Page A167

PDJNR/L
Kr:93°



A174

PDPNN
Kr:62°30'



A175

PDPNR/L
Kr:62°30'

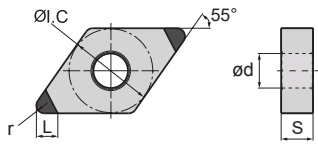


A213

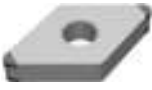
PDUNR/L
Kr:93°



A214

DN  (Negative angle)
 Good working condition
  Normal working condition
  Bad working condition

Workpiece material	K Cast iron											
	S Heat resistant alloy, Ti alloy											
	H Super hard material											
	N Non ferrous metal											

Type	Shape of insert	Model	Specifi- cation	Dimension(mm)					Cast iron				Hardened steel					Powder alloy & Superalloy		
				ØI.C	S	ød	r	L	BK1011	BK1021	BK2511	BK2541	BH0121	BH1020	BH2011	BH2511	BH3511	BS1011	BS2011	BS3011
Double-sided insert		DNGA150404DS01225-4	S01225	12.7	4.76	5.156	0.4	2.5	○	○			★	★	★	★	★	○	○	○
		DNGA150408DS01225-4		12.7	4.76	5.156	0.8	2.1	○	○			★	★	★	★	★	○	○	○
		DNGA150412DS01225-4		12.7	4.76	5.156	1.2	2.0	○	○			★	★	★	★	★	○	○	○
		DNGA150602DS01225-4		12.7	6.35	5.156	0.2	2.7					★	★	★	★	★			
		DNGA150604DS01225-4		12.7	6.35	5.156	0.4	2.5	○	○			★	★	★	★	★	○	○	○
		DNGA150608DS01225-4		12.7	6.35	5.156	0.8	2.1	○	○			★	★	★	★	★	○	○	○
		DNGA150612DS01225-4		12.7	6.35	5.156	1.2	2.0	○	○			★	★	★	★	★	○	○	○
		DNGA150404DS00815-4	S00815	12.7	4.76	5.156	0.4	2.5					★	★	○					
		DNGA150408DS00815-4		12.7	4.76	5.156	0.8	2.1					★	★	○					
		DNGA150412DS00815-4		12.7	4.76	5.156	1.2	2.0					★	★	○					
		DNGA150602DS00815-4		12.7	6.35	5.156	0.2	2.7					★	★	○					
		DNGA150604DS00815-4		12.7	6.35	5.156	0.4	2.5					★	★	○					
		DNGA150608DS00815-4		12.7	6.35	5.156	0.8	2.1					★	★	○					
		DNGA150612DS00815-4		12.7	6.35	5.156	1.2	2.0					★	★	○					
		DNGA150404DS01735-4	S01735	12.7	4.76	5.156	0.4	2.5						○	★	○				
		DNGA150408DS01735-4		12.7	4.76	5.156	0.8	2.1						○	★	○				
		DNGA150412DS01735-4		12.7	4.76	5.156	1.2	2.0						○	★	○				
		DNGA150602DS01735-4		12.7	6.35	5.156	0.2	2.7						○	★	○				
		DNGA150604DS01735-4		12.7	6.35	5.156	0.4	2.5						○	★	○				
		DNGA150608DS01735-4		12.7	6.35	5.156	0.8	2.1						○	★	○				
		DNGA150612DS01735-4		12.7	6.35	5.156	1.2	2.0						○	★	○				

According to processing requirements, the size and number of non-standard tool nose arcs can be provided.

When using PCBN blades, please try to keep the cutting depth below 0.5mm.

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

Applicable tool

DDJNR/L
Kr:93°

Page A167

PDJNR/L
Kr:93°

A174

PDPNN
Kr:62°30'

A175

PDPNR/L
Kr:62°30'

A213

PDUNR/L
Kr:93°

A214

General
turning

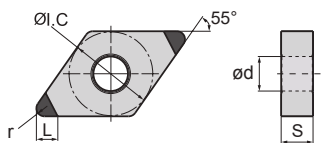
PCBN&PCD inserts



General Turning Inserts

PCBN&PCD inserts

DN (Negative angle)



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

Workpiece material	Cast iron	Heat resistant alloy, Ti alloy	Super hard material	Non ferrous metal
K	😊😊😊😊	😊😊😊😊	😊😊😊😊	😊😊😊😊
S	😊😊😊😊	😊😊😊😊	😊😊😊😊	😊😊😊😊
H	😊😊😊😊	😊😊😊😊	😊😊😊😊	😊😊😊😊
N	😊😊😊😊	😊😊😊😊	😊😊😊😊	😊😊😊😊

Type	Shape of insert	Model	Specifi- cation	Dimension(mm)					Cast iron				Hardened steel					Powder alloy& Superalloy		
				ØI.C	S	ød	r	L	BK1011	BK1021	BK2511	BK2541	BH0121	BH1020	BH2011	BH2511	BH3511	BS1011	BS2011	BS3011
Penetration insert		DNGA150404CE-2	CE	12.7	4.76	5.156	0.4	2.5			○									
		DNGA150408CE-2		12.7	4.76	5.156	0.8	2.1			○									
		DNGA150412CE-2		12.7	4.76	5.156	1.2	2.0			○									
		DNGA150604CE-2		12.7	6.35	5.156	0.4	2.5			○									
		DNGA150608CE-2		12.7	6.35	5.156	0.8	2.1			○									
		DNGA150612CE-2		12.7	6.35	5.156	1.2	2.0			○									
		DNGA150404CT01215-2	T01215	12.7	4.76	5.156	0.4	2.5			★									
		DNGA150408CT01215-2		12.7	4.76	5.156	0.8	2.1			★									
		DNGA150412CT01215-2		12.7	4.76	5.156	1.2	2.0			★									
		DNGA150604CT01215-2		12.7	6.35	5.156	0.4	2.5			★									
		DNGA150608CT01215-2		12.7	6.35	5.156	0.8	2.1			★									
		DNGA150612CT01215-2		12.7	6.35	5.156	1.2	2.0			★									
		DNGA150404CS01225-2	S01225	12.7	4.76	5.156	0.4	2.5			○									
		DNGA150408CS01225-2		12.7	4.76	5.156	0.8	2.1			○									
		DNGA150412CS01225-2		12.7	4.76	5.156	1.2	2.0			○									
		DNGA150604CS01225-2		12.7	6.35	5.156	0.4	2.5			○									
		DNGA150608CS01225-2		12.7	6.35	5.156	0.8	2.1			○									
		DNGA150612CS01225-2		12.7	6.35	5.156	1.2	2.0			○									

According to processing requirements, the size and number of non-standard tool nose arcs can be provided.

When using PCBN blades, please try to keep the cutting depth below. 0.5mm.

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

Applicable tool

DDJNR/L
Kr:93°



Page A167

PDJNR/L
Kr:93°



A174

PDPNN
Kr:62°30'



A175

PDPNR/L
Kr:62°30'



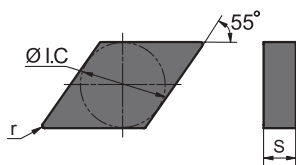
A213

PDUNR/L
Kr:93°



A214

😊 Good working condition 😐 Normal working condition 😞 Bad working condition



Workpiece material	Cast iron	Heat resistant alloy, Ti alloy	Super hard material	Non ferrous metal
	☹️☹️☹️☹️			
			😊😊☹️☹️☹️	😊☹️☹️

Type	Shape of insert	Model	Specifi- cation	Dimension(mm)			Cast iron		Hardened steel				Powder alloy& Superalloy					
				ØI.C	S	r	BK1011	BK1021	BK2511	BK2541	BH0121	BH1020	BH2011	BH2511	BH3511	BS1011	BS2011	BS3011
Intact insert		DNGN150404BE	BE	12.7	4.76	0.4		○										
		DNGN150408BE		12.7	4.76	0.8		○										
		DNGN150412BE		12.7	4.76	1.2		○										
		DNGN150604BE		12.7	6.35	0.4		○										
		DNGN150608BE		12.7	6.35	0.8		○										
		DNGN150612BE		12.7	6.35	1.2		○										
		DNGN150404BT01215	T01215	12.7	4.76	0.4		★										
		DNGN150408BT01215		12.7	4.76	0.8		★										
		DNGN150412BT01215		12.7	4.76	1.2		★										
		DNGN150604BT01215		12.7	6.35	0.4		★										
		DNGN150608BT01215		12.7	6.35	0.8		★										
		DNGN150612BT01215		12.7	6.35	1.2		★										
		DNGN150404BS01225	S01225	12.7	4.76	0.4		○										
		DNGN150408BS01225		12.7	4.76	0.8		○										
		DNGN150412BS01225		12.7	4.76	1.2		○										
		DNGN150604BS01225		12.7	6.35	0.4		○										
		DNGN150608BS01225		12.7	6.35	0.8		○										
		DNGN150612BS01225		12.7	6.35	1.2		○										

When using PCBN blades, please try to keep the cutting depth below 0.5mm.

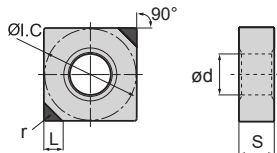
★ Recommended grade (always stock available) ○ Make-to-order



General Turning Inserts

PCBN&PCD inserts

SN (Negative angle)



😊 Good working condition 😐 Normal working condition 😞 Bad working condition

Workpiece material	K Cast iron	S Heat resistant alloy, Ti alloy	H Super hard material	N Non ferrous metal
	😊😊😊😊	😊😊😊😊	😊😊😊😊	😊😊😊😊

Type	Shape of insert	Model	Specifi- cation	Dimension(mm)					Cast iron				Hardened steel					Powder alloy& Superalloy			
				ØI.C	S	ød	r	L	BK1011	BK1021	BK2511	BK2541	BH0121	BH1020	BH2011	BH2511	BH3511	BS1011	BS2011	BS3011	
Single-sided insert		SNGA120404AE-2	AE	12.7	4.76	5.156	0.4	2.5	○	○								○	○	○	
		SNGA120408AE-2		12.7	4.76	5.156	0.8	2.2	○	○								○	○	○	
		SNGA120412AE-2		12.7	4.76	5.156	1.2	2.0	○	○									○	○	○
		SNGA120404AE-4		12.7	4.76	5.156	0.4	2.5											○	○	○
		SNGA120408AE-4		12.7	4.76	5.156	0.8	2.2											○	○	○
		SNGA120412AE-4		12.7	4.76	5.156	1.2	2.0											○	○	○
		SNGA120404AT01215-2	T01215	12.7	4.76	5.156	0.4	2.5	○	○									○	○	○
		SNGA120408AT01215-2		12.7	4.76	5.156	0.8	2.2	○	○									○	○	○
		SNGA120412AT01215-2		12.7	4.76	5.156	1.2	2.0	○	○									○	○	○
		SNGA120404AT01215-4		12.7	4.76	5.156	0.4	2.5											○	○	○
		SNGA120408AT01215-4		12.7	4.76	5.156	0.8	2.2											○	○	○
		SNGA120412AT01215-4		12.7	4.76	5.156	1.2	2.0											○	○	○
		SNGA120404AS01225-2	S01225	12.7	4.76	5.156	0.4	2.5	○	○									○	○	○
		SNGA120408AS01225-2		12.7	4.76	5.156	0.8	2.2	○	○									○	○	○
		SNGA120412AS01225-2		12.7	4.76	5.156	1.2	2.0	○	○									○	○	○
		SNGA120404AS01225-4		12.7	4.76	5.156	0.4	2.5					○	○	○	○	○	○	○	○	○
		SNGA120408AS01225-4		12.7	4.76	5.156	0.8	2.2					○	○	○	○	○	○	○	○	○
		SNGA120412AS01225-4		12.7	4.76	5.156	1.2	2.0					○	○	○	○	○	○	○	○	○
		SNGA120404AS00815-4	S00815	12.7	4.76	5.156	0.4	2.5					○	○	○						
		SNGA120408AS00815-4		12.7	4.76	5.156	0.8	2.2					○	○	○						
		SNGA120412AS00815-4		12.7	4.76	5.156	1.2	2.0					○	○	○						
		SNGA120404AS01735-4	S01735	12.7	4.76	5.156	0.4	2.5							○	○	○				
		SNGA120408AS01735-4		12.7	4.76	5.156	0.8	2.2							○	○	○				
		SNGA120412AS01735-4		12.7	4.76	5.156	1.2	2.0							○	○	○				

According to processing requirements, the size and number of non-standard tool nose arcs can be provided.

When using PCBN blades, please try to keep the cutting depth below 0.5mm.

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

Applicable tool

DSBNR/L
Kr:75°



Page A168

PSBNR/L
Kr:75°



A176

PSDNN
Kr:45°



A177

PSKNR/L
Kr:75°



A178

PSSNR/L
Kr:45°

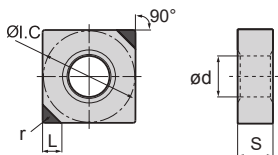


A179

PSKNR/L
Kr:75°



A215

SN 

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

	Cast iron	Heat resistant alloy, Ti alloy	Super hard material	Non ferrous metal
Workpiece material				

General turning

PCBN&PCD inserts

Type	Shape of insert	Model	Specifi- cation	Dimension(mm)					Cast iron				Hardened steel					Powder alloy& Superalloy		
				ØI.C	S	ød	r	L	BK1011	BK1021	BK2511	BK2541	BH0121	BH1020	BH2011	BH2511	BH3511	BS1011	BS2011	BS3011
Double-sided insert		SNGA120404DE-4	DE	12.7	4.76	5.156	0.4	2.5	○	○										
		SNGA120408DE-4		12.7	4.76	5.156	0.8	2.2	○	○										
		SNGA120412DE-4		12.7	4.76	5.156	1.2	2.0	○	○										
		SNGA120404DT01215-4	T01215	12.7	4.76	5.156	0.4	2.5	★	★										
		SNGA120408DT01215-4		12.7	4.76	5.156	0.8	2.2	★	★										
		SNGA120412DT01215-4		12.7	4.76	5.156	1.2	2.0	★	★										
		SNGA120404DS01225-4	S01225	12.7	4.76	5.156	0.4	2.5	○	○										
		SNGA120408DS01225-4		12.7	4.76	5.156	0.8	2.2	○	○										
		SNGA120412DS01225-4		12.7	4.76	5.156	1.2	2.0	○	○										
		SNGA120404DS01225-8		12.7	4.76	5.156	0.4	2.5				○	○	○	○	○				
		SNGA120408DS01225-8		12.7	4.76	5.156	0.8	2.2				○	○	○	○	○				
		SNGA120412DS01225-8		12.7	4.76	5.156	1.2	2.0				○	○	○	○	○				
		SNGA120404DS00815-8	S00815	12.7	4.76	5.156	0.4	2.5				○	○	○						
		SNGA120408DS00815-8		12.7	4.76	5.156	0.8	2.2				○	○	○						
		SNGA120412DS00815-8		12.7	4.76	5.156	1.2	2.0				○	○	○						
		SNGA120404DS01735-8	S01735	12.7	4.76	5.156	0.4	2.5						○	○	○				
		SNGA120408DS01735-8		12.7	4.76	5.156	0.8	2.2						○	○	○				
		SNGA120412DS01735-8		12.7	4.76	5.156	1.2	2.0						○	○	○				

According to processing requirements, the size and number of non-standard tool nose arcs can be provided.

When using PCBN blades, please try to keep the cutting depth below 0.5mm.

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

Applicable tool

DSBNR/L
Kr:75°



Page A168

PSBNR/L
Kr:75°



A176

PSDNN
Kr:45°



A177

PSKNR/L
Kr:75°



A178

PSSNR/L
Kr:45°



A179

PSKNR/L
Kr:75°



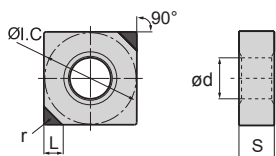
A215



General Turning Inserts

PCBN&PCD inserts

SN (Negative angle)



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

Workpiece material	K Cast iron	S Heat resistant alloy, Ti alloy	H Super hard material	N Non ferrous metal
	😊😊😊😊	😊😊😊😊	😊😊😊😊	😊😊😊😊

Type	Shape of insert	Model	Specifi- cation	Dimension(mm)					Cast iron				Hardened steel					Powder alloy& Superalloy		
				ØI.C	S	ød	r	L	BK1011	BK1021	BK2511	BK2541	BH0121	BH1020	BH2011	BH2511	BH3511	BS1011	BS2011	BS3011
Penetration insert		SNGA120404CE-2	CE	12.7	4.76	5.156	0.4	2.5			○									
		SNGA120408CE-2		12.7	4.76	5.156	0.8	2.2			○									
		SNGA120412CE-2		12.7	4.76	5.156	1.2	2.0			○									
		SNGA120404CE-4		12.7	4.76	5.156	0.4	2.5			○									
		SNGA120408CE-4		12.7	4.76	5.156	0.8	2.2			○									
		SNGA120412CE-4		12.7	4.76	5.156	1.2	2.0			○									
		SNGA120404CT01215-4	T01215	12.7	4.76	5.156	0.4	2.5			★									
		SNGA120408CT01215-4		12.7	4.76	5.156	0.8	2.2			★									
		SNGA120412CT01215-4		12.7	4.76	5.156	1.2	2.0			★									
		SNGA120404CT01215-2		12.7	4.76	5.156	0.4	2.5			★									
		SNGA120408CT01215-2		12.7	4.76	5.156	0.8	2.2			★									
		SNGA120412CT01215-2		12.7	4.76	5.156	1.2	2.0			★									
		SNGA120404CS01225-4	S01225	12.7	4.76	5.156	0.4	2.5			○									
		SNGA120408CS01225-4		12.7	4.76	5.156	0.8	2.2			○									
		SNGA120412CS01225-4		12.7	4.76	5.156	1.2	2.0			○									
		SNGA120404CS01225-2		12.7	4.76	5.156	0.4	2.5			○									
		SNGA120408CS01225-2		12.7	4.76	5.156	0.8	2.2			○									
		SNGA120412CS01225-2		12.7	4.76	5.156	1.2	2.0			○									

According to processing requirements, the size and number of non-standard tool nose arcs can be provided.

When using PCBN blades, please try to keep the cutting depth below. 0.5mm.

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

Applicable tool

DSBNR/L
Kr:75°



Page A168

PSBNR/L
Kr:75°



A176

PSDNN
Kr:45°



A177

PSKNR/L
Kr:75°



A178

PSSNR/L
Kr:45°

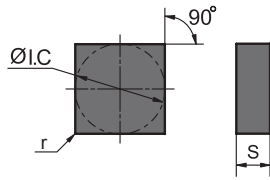


A179

PSKNR/L
Kr:75°



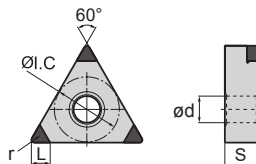
A215

SN   (Negative angle)

Good working condition Normal working condition Bad working condition

Workpiece material	K	Cast iron										😊	😊	😊	😊																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					</
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TN (Negative angle)



😊 Good working condition 😐 Normal working condition 😞 Bad working condition

	Cast iron	Heat resistant alloy, Ti alloy	Super hard material	Non ferrous metal
Workpiece material				

[illegible]

According to processing requirements, the size and number of non-standard tool nose arcs can be provided.

When using PCBN blades, please try to keep the cutting depth below 0.5mm.

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

Applicable tool

DTG NR/L
Kr: 90°

Page A169

PTFNR/L
Kr:90°



A180

PTTNR/L
Kr:60°



A181

PTG NR/L
Kr:90°



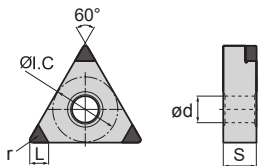
A182

PTFNR/L
Kr:90°



A216

TN□□



😊 Good working condition 😐 Normal working condition 😞 Bad working condition

	Cast iron	Heat resistant alloy, Ti alloy	Super hard material	Non ferrous metal
Workpiece material				

PCBN&PCD inserts

Type	Shape of insert	Model	Specifi- cation	Dimension(mm)					Cast iron				Hardened steel					Powder alloy& Superalloy		
				ØI.C	S	ød	r	L	BK1011	BK1021	BK2511	BK2541	BH0121	BH1020	BH2011	BH2511	BH3511	BS1011	BS2011	BS3011
Double-sided insert		TNGA160404DS01225-6	S01225	9.525	4.76	3.81	0.4	2.5	○	○			★	★	★	★	★	○	○	○
		TNGA160408DS01225-6		9.525	4.76	3.81	0.8	2.2	○	○			★	★	★	★	★	○	○	○
		TNGA160412DS01225-6		9.525	4.76	3.81	1.2	2.0	○	○			★	★	★	★	★	○	○	○
		TNGA160404DS00815-6	S00815	9.525	4.76	3.81	0.4	2.5					★	★	○					
		TNGA160408DS00815-6		9.525	4.76	3.81	0.8	2.2					★	★	○					
		TNGA160412DS00815-6		9.525	4.76	3.81	1.2	2.0					★	★	○					
		TNGA160404DS01735-6	S01735	9.525	4.76	3.81	0.4	2.5							○	★	○			
		TNGA160408DS01735-6		9.525	4.76	3.81	0.8	2.2						○	★	○				
		TNGA160412DS01735-6		9.525	4.76	3.81	1.2	2.0						○	★	○				
Penetration insert		TNGA160404CE-3	CE	9.525	4.76	3.81	0.4	2.5			○									
		TNGA160408CE-3		9.525	4.76	3.81	0.8	2.2			○									
		TNGA160412CE-3		9.525	4.76	3.81	1.2	2.0			○									
		TNGA160404CT01215-3	T01215	9.525	4.76	3.81	0.4	2.5			★									
		TNGA160408CT01215-3		9.525	4.76	3.81	0.8	2.2			★									
		TNGA160412CT01215-3		9.525	4.76	3.81	1.2	2.0			★									
		TNGA160404CS01225-3	S01225	9.525	4.76	3.81	0.4	2.5			○									
		TNGA160408CS01225-3		9.525	4.76	3.81	0.8	2.2			○									
		TNGA160412CS01225-3		9.525	4.76	3.81	1.2	2.0			○									

According to processing requirements, the size and number of non-standard tool nose arcs can be provided.

When using PCBN blades, please try to keep the cutting depth below 0.5mm.

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

Applicable tool

DTG NR/L
Kr: 90°

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PTFNR/L
Kr:90°



A180

PTTNR/L
Kr:60°



A181

PTG NR/L
Kr:90°



A182

PTFNR/L
Kr:90°



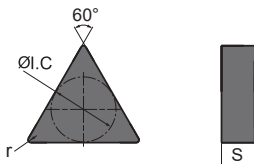
A216



General Turning Inserts

PCBN&PCD inserts

TN (Negative angle)



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

Workpiece material	K Cast iron	😊	😊	😊	😊													
	S Heat resistant alloy, Ti alloy																😊	😊
	H Super hard material									😊	😊	😊	😊	😊				
	N Non ferrous metal																	

Type	Shape of insert	Model	Specifi- cation	Dimension(mm)			Cast iron				Hardened steel					Powder alloy& Superalloy		
				Ø1.C	S	r	BK1011	BK1021	BK2511	BK2541	BH0121	BH1020	BH2011	BH2511	BH3511	BS1011	BS2011	BS3011
Intact insert		TNGN160404BE	BE	9.525	4.76	0.4			○									
		TNGN160408BE		9.525	4.76	0.8			○									
		TNGN160412BE		9.525	4.76	1.2			○									
		TNGN160404BT01215	T01215	9.525	4.76	0.4			★									
		TNGN160408BT01215		9.525	4.76	0.8			★									
		TNGN160412BT01215		9.525	4.76	1.2			★									
		TNGN160404BS01225	S01225	9.525	4.76	0.4			○									
		TNGN160408BS01225		9.525	4.76	0.8			○									
		TNGN160412BS01225		9.525	4.76	1.2			○									

According to processing requirements, the size and number of non-standard tool nose arcs can be provided.

When using PCBN blades, please try to keep the cutting depth below 0.5mm.

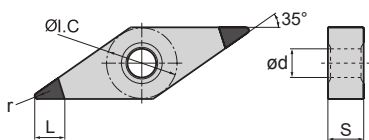
★ Recommended grade (always stock available) ○ Make-to-order

General turning

PCBN&PCD inserts



VN (Negative angle)



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

Workpiece material	K Cast iron	S Heat resistant alloy, Ti alloy	H Super hard material	N Non ferrous metal
	😊😊😊😊	😊😊😊😊	😊😊😊😊	😊😊😊😊

Type	Shape of insert	Model	Specifi- cation	Dimension(mm)					Cast iron				Hardened steel					Powder alloy& Superalloy		
				Øl.C	S	ød	r	L	BK1011	BK1021	BK2511	BK2541	BH0121	BH1020	BH2011	BH2511	BH3511	BS1011	BS2011	BS3011
Single-sided insert		VNGA160404AE-2	AE	9.525	4.76	3.81	0.4	2.8										○	○	○
		VNGA160408AE-2		9.525	4.76	3.81	0.8	2.5										○	○	○
		VNGA160412AE-2		9.525	4.76	3.81	1.2	2.0										○	○	○
		VNGA160404AT01215-2	T01215	9.525	4.76	3.81	0.4	2.8										○	○	○
		VNGA160408AT01215-2		9.525	4.76	3.81	0.8	2.5										○	○	○
		VNGA160412AT01215-2		9.525	4.76	3.81	1.2	2.0										○	○	○
		VNGA160404AS01225-2	S01225	9.525	4.76	3.81	0.4	2.8					○	○	○	○	○	○	○	○
		VNGA160408AS01225-2		9.525	4.76	3.81	0.8	2.5					○	○	○	○	○	○	○	○
		VNGA160412AS01225-2		9.525	4.76	3.81	1.2	2.0					○	○	○	○	○	○	○	○
		VNGA160404AS00815-2	S00815	9.525	4.76	3.81	0.4	2.8					○	○	○					
		VNGA160408AS00815-2		9.525	4.76	3.81	0.8	2.5					○	○	○					
		VNGA160412AS00815-2		9.525	4.76	3.81	1.2	2.0					○	○	○					
		VNGA160404AS01735-2	S01735	9.525	4.76	3.81	0.4	2.8							○	○	○			
		VNGA160408AS01735-2		9.525	4.76	3.81	0.8	2.5							○	○	○			
		VNGA160412AS01735-2		9.525	4.76	3.81	1.2	2.0							○	○	○			
Double-sided insert		VNGA160404DE-4	DE	9.525	4.76	3.81	0.4	2.8										○	○	○
		VNGA160408DE-4		9.525	4.76	3.81	0.8	2.5										○	○	○
		VNGA160412DE-4		9.525	4.76	3.81	1.2	2.0										○	○	○
		VNGA160404DT01215-4	T01215	9.525	4.76	3.81	0.4	2.8										★	★	★
		VNGA160408DT01215-4		9.525	4.76	3.81	0.8	2.5										★	★	★
		VNGA160412DT01215-4		9.525	4.76	3.81	1.2	2.0										★	★	★

According to processing requirements, the size and number of non-standard tool nose arcs can be provided.

When using PCBN blades, please try to keep the cutting depth below 0.5mm.

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

Applicable tool

DVNN
Kr:72°30'



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DVJNR/L
Kr:93°



A170

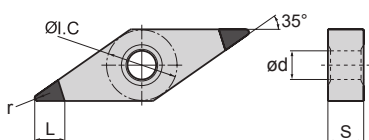
General
turning

PCBN&PCD inserts

TURNING / General Turning Inserts

PCBN&PCD inserts

VN ☐ ☐ (Negative angle)



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

	Cast iron	Heat resistant alloy, Ti alloy	Super hard material	Non ferrous metal
Workpiece material	😊😊😐😞		😊😊😐😞😞	

Type	Shape of insert	Model	Specifi- cation	Dimension(mm)					Cast iron				Hardened steel					Powder alloy& Superalloy		
				ØI.C	S	ød	r	L	BK1011	BK1021	BK2511	BK2541	BH0121	BH1020	BH2011	BH2511	BH3511	BS1011	BS2011	BS3011
Double-sided insert		VNGA160404DS01225-4	S01225	9.525	4.76	3.81	0.4	2.8					★	★	★	★	★	○	○	○
		VNGA160408DS01225-4		9.525	4.76	3.81	0.8	2.5					★	★	★	★	★	○	○	○
		VNGA160412DS01225-4		9.525	4.76	3.81	1.2	2.0					★	★	★	★	★	○	○	○
		VNGA160404DS00815-4	S00815	9.525	4.76	3.81	0.4	2.8					★	★	○					
		VNGA160408DS00815-4		9.525	4.76	3.81	0.8	2.5					★	★	○					
		VNGA160412DS00815-4		9.525	4.76	3.81	1.2	2.0					★	★	○					
		VNGA160404DS01735-4	S01735	9.525	4.76	3.81	0.4	2.8							○	★	○			
		VNGA160408DS01735-4		9.525	4.76	3.81	0.8	2.5						○	★	○				
		VNGA160412DS01735-4		9.525	4.76	3.81	1.2	2.0						○	★	○				
Penetration insert		VNGA160402CE-2	CE	9.525	4.76	3.81	0.2	3.3			○									
		VNGN160404CE-2		9.525	4.76	3.81	0.4	2.8			○									
		VNGN160408CE-2		9.525	4.76	3.81	0.8	2.5												
		VNGN160412CE-2		9.525	4.76	3.81	1.2	2.0			○									
		VNGA160402CT01215-2	T01215	9.525	4.76	3.81	0.2	3.3			★									
		VNGN160404CT01215-2		9.525	4.76	3.81	0.4	2.8			★									
		VNGN160408CT01215-2		9.525	4.76	3.81	0.8	2.5			★									
		VNGN160412CT01215-2		9.525	4.76	3.81	1.2	2.0			★									
		VNGA160402CS01225-2	S01225	9.525	4.76	3.81	0.2	3.3			○									
		VNGN160404CS01225-2		9.525	4.76	3.81	0.4	2.8			○									
		VNGN160408CS01225-2		9.525	4.76	3.81	0.8	2.5												
		VNGN160412CS01225-2		9.525	4.76	3.81	1.2	2.0			○									

According to processing requirements, the size and number of non-standard tool nose arcs can be provided.

When using PCBN blades, please try to keep the cutting depth below 0.5mm.

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

Applicable tool

DVVNN
Kr:72°30'

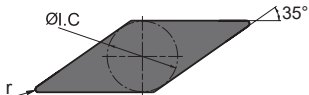


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DVJNR/L
Kr:93°



A170

VN 

😊 Good working condition

😐 Normal working cond

🙄 Bad working condition

Workpiece material	K	Cast iron
	S	Heat resistant alloy, Ti alloy
	H	Super hard material
	N	Non ferrous metal

General turning

PCBN&PCD inserts

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According to processing requirements, the size and number of non-standard tool nose arcs can be provided.

When using PCBN blades, please try to keep the cutting depth below 0.5mm.

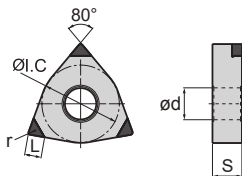
★ Recommended grade (always stock available) ○ Make-to-order



General Turning Inserts

PCBN&PCD inserts

WN (Negative angle)



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

Workpiece material	Cast iron	Heat resistant alloy, Ti alloy	Super hard material	Non ferrous metal
K	😊😊😊😊	😊😊😊😊	😊😊😊😊	😊😊😊😊
S	😊😊😊😊	😊😊😊😊	😊😊😊😊	😊😊😊😊
H	😊😊😊😊	😊😊😊😊	😊😊😊😊	😊😊😊😊
N	😊😊😊😊	😊😊😊😊	😊😊😊😊	😊😊😊😊

Type	Shape of insert	Model	Specifi- cation	Dimension(mm)					Cast iron				Hardened steel					Powder alloy& Superalloy		
				ØI.C	S	ød	r	L	BK1011	BK1021	BK2511	BK2541	BH0121	BH1020	BH2011	BH2511	BH3511	BS1011	BS2011	BS3011
Single-sided insert		WNGA080404AE-3	AE	12.7	4.76	5.16	0.4	2.5										○	○	○
		WNGA080408AE-3		12.7	4.76	5.16	0.8	2.4										○	○	○
		WNGA080412AE-3		12.7	4.76	5.16	1.2	2.3										○	○	○
		WNGA080404AT01215-3	T01215	12.7	4.76	5.16	0.4	2.5										○	○	○
		WNGA080408AT01215-3		12.7	4.76	5.16	0.8	2.4										○	○	○
		WNGA080412AT01215-3		12.7	4.76	5.16	1.2	2.3										○	○	○
		WNGA080404AS01225-3	S01225	12.7	4.76	5.16	0.4	2.5					○	○	○	○	○	○	○	○
		WNGA080408AS01225-3		12.7	4.76	5.16	0.8	2.4					○	○	○	○	○	○	○	○
		WNGA080412AS01225-3		12.7	4.76	5.16	1.2	2.3					○	○	○	○	○	○	○	○
		WNGA080404AS00815-3	S00815	12.7	4.76	5.16	0.4	2.5					○	○	○					
		WNGA080408AS00815-3		12.7	4.76	5.16	0.8	2.4					○	○	○					
		WNGA080412AS00815-3		12.7	4.76	5.16	1.2	2.3					○	○	○					
		WNGA080404AS01735-3	S01735	12.7	4.76	5.16	0.4	2.5							○	○	○			
		WNGA080408AS01735-3		12.7	4.76	5.16	0.8	2.4							○	○	○			
		WNGA080412AS01735-3		12.7	4.76	5.16	1.2	2.3							○	○	○			
Double-sided insert		WNGA080404DE-6	DE	12.7	4.76	5.16	0.4	2.5	○	○										
		WNGA080408DE-6		12.7	4.76	5.16	0.8	2.4	○	○										
		WNGA080412DE-6		12.7	4.76	5.16	1.2	2.3	○	○										
		WNGA080404DT01215-6	T01215	12.7	4.76	5.16	0.4	2.5	★	★										
		WNGA080408DT01215-6		12.7	4.76	5.16	0.8	2.4	★	★										
		WNGA080412DT01215-6		12.7	4.76	5.16	1.2	2.3	★	★										

According to processing requirements, the size and number of non-standard tool nose arcs can be provided.

When using PCBN blades, please try to keep the cutting depth below. 0.5mm.

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

Applicable tool

DWLN/L
Kr:95°



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PWLN/L
Kr:95°

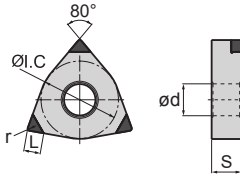


A183

PWLN/L
Kr:95°



A217


WN  (Negative angle)

 Good working condition
  Normal working condition
  Bad working condition

Workpiece material	K Cast iron											
	S Heat resistant alloy, Ti alloy											
	H Super hard material											
	N Non ferrous metal											

Type	Shape of insert	Model	Specifi- cation	Dimension(mm)					Cast iron				Hardened steel					Powder alloy& Superalloy		
				ØL.C	S	ød	r	L	BK1011	BK1021	BK2511	BK2541	BH0121	BH1020	BH2011	BH2511	BH3511	BS1011	BS2011	BS3011
Double-sided insert		WNGA080404DS01225-6	S01225	12.7	4.76	5.16	0.4	2.5	○	○										
		WNGA080408DS01225-6		12.7	4.76	5.16	0.8	2.4	○	○										
		WNGA080412DS01225-6		12.7	4.76	5.16	1.2	2.3	○	○										
		WNGA080404DS00815-6	S00815	12.7	4.76	3.81	0.4	2.5					★	★	○					
		WNGA080408DS00815-6		12.7	4.76	3.81	0.8	2.2					★	★	○					
		WNGA080412DS00815-6		12.7	4.76	3.81	1.2	2.0					★	★	○					
		WNGA080404DS01225-6	S01225	12.7	4.76	3.81	0.4	2.5					★	★	★	★	★			
		WNGA080408DS01225-6		12.7	4.76	3.81	0.8	2.2					★	★	★	★	★			
		WNGA080412DS01225-6		12.7	4.76	3.81	1.2	2.0					★	★	★	★	★			
		WNGA080404DS01735-6	S01735	12.7	4.76	3.81	0.4	2.5							○	★	○			
		WNGA080408DS01735-6		12.7	4.76	3.81	0.8	2.2							○	★	○			
		WNGA080412DS01735-6		12.7	4.76	3.81	1.2	2.0							○	★	○			
Penetration insert		WNGA080404CE-3	CE	12.7	4.76	5.16	0.4	2.5		○										
		WNGN080408CE-3		12.7	4.76	5.16	0.8	2.4		○										
		WNGN080412CE-3		12.7	4.76	5.16	1.2	2.3		○										
		WNGA080404CT01215-3	T01215	12.7	4.76	5.16	0.4	2.5		★										
		WNGN080408CT01215-3		12.7	4.76	5.16	0.8	2.4		★										
		WNGN080412CT01215-3		12.7	4.76	5.16	1.2	2.3		★										
		WNGA080404CS01225-3	S01225	12.7	4.76	5.16	0.4	2.5		○										
		WNGN080408CS01225-3		12.7	4.76	5.16	0.8	2.4		○										
		WNGN080412CS01225-3		12.7	4.76	5.16	1.2	2.3		○										

According to processing requirements, the size and number of non-standard tool nose arcs can be provided.

When using PCBN blades, please try to keep the cutting depth below 0.5mm.

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

Applicable tool

DWLNR/L
Kr:95°


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PWLNR/L
Kr:95°


A183

PWLNR/L
Kr:95°


A217

General turning

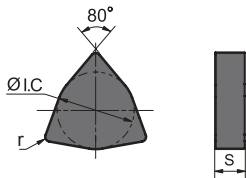
PCBN&PCD inserts



General Turning Inserts

PCBN&PCD inserts

WN (Negative angle)



😊 Good working condition 😐 Normal working condition 😞 Bad working condition

Workpiece material	K Cast iron	S Heat resistant alloy, Ti alloy	H Super hard material	N Non ferrous metal
	😊😊😊😊	😊😊😊😊	😊😊😊😊	😊😊😊😊

Type	Shape of insert	Model	Specifi- cation	Dimension(mm)			Cast iron				Hardened steel					Powder alloy& Superalloy		
				ØI.C	S	r	BK1011	BK1021	BK2511	BK2541	BH0121	BH1020	BH2011	BH2511	BH3511	BS1011	BS2011	BS3011
Intact insert		WNGN080404BE	BE	12.7	4.76	0.4			○									
		WNGN080408BE		12.7	4.76	0.8			○									
		WNGN080412BE		12.7	4.76	1.2			○									
		WNGN080404BT01215	T01215	12.7	4.76	0.4			★									
		WNGN080408BT01215		12.7	4.76	0.8			★									
		WNGN080412BT01215		12.7	4.76	1.2			★									
		WNGN080404BS01225	S01225	12.7	4.76	0.4			○									
		WNGN080408BS01225		12.7	4.76	0.8			○									
		WNGN080412BS01225		12.7	4.76	1.2			○									

According to processing requirements, the size and number of non-standard tool nose arcs can be provided.

When using PCBN blades, please try to keep the cutting depth below. 0.5mm.

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

General turning

PCBN&PCD inserts

	Cast iron	Heat resistant alloy, Ti alloy	Super hard material	Non ferrous metal
Workpiece material	😊😊😐😞		😊😊😐😞😞	
		😊😐😞		

[illegible]

When using PCBN blades, please try to keep the cutting depth below 0.5mm.

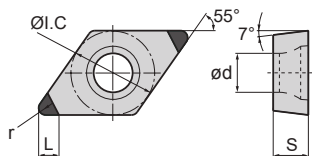
★ Recommended grade (always stock available) ○ Make-to-order

A233

General Turning Inserts

PCBN&PCD inserts

DC ☐ ☐ (Positive angle)



😊 Good working condition 😐 Normal working condition 😞 Bad working condition

	Cast iron	Heat resistant alloy, Ti alloy	Super hard material	Non ferrous metal
Workpiece material				

General turning

PCBN&PCD inserts

[illegible]

According to processing requirements, the size and number of non-standard tool nose arcs can be provided.

When using PCBN blades, please try to keep the cutting depth below 0.5mm.

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

Applicable tool

SDACR/L
Kr:90°

Page A186

SDJCR/L
Kr:93°

A187

SDNCN
Kr:62°30'



A188

SDQCR/L
Kr:107°30'



A219

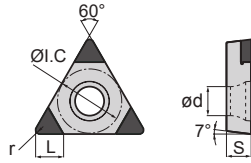
SDUCR/L
Kr:93°

A220

SDZCR/L
Kr:95°

A221

TC (Positive angle)



😊 Good working condition 😐 Normal working condition 😞 Bad working condition

	Cast iron	Heat resistant alloy, Ti alloy	Super hard material	Non ferrous metal
Workpiece material	😊😊😐😞		😊😊😐😞😞	

[illegible]

According to processing requirements, the size and number of non-standard tool nose arcs can be provided.

When using PCBN blades, please try to keep the cutting depth below 0.5mm.

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

Applicable tool

STACR/L
Kr:90°



Page A198

STFCR/L
Kr:90°



A198

STGCR/L
Kr:91°



A199

STECR/L
Kr:60°



A200

STFCR/L
Kr:90°



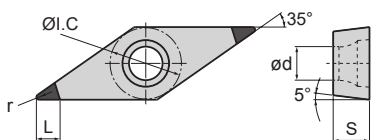
A223



General Turning Inserts

PCBN&PCD inserts

VB (Positive angle)



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

Workpiece material	K	S	H	N	Cast iron	Heat resistant alloy, Ti alloy	Super hard material	Non ferrous metal
	😊	😊	😊	😊				
		😊	😊	😊				
			😊	😊				
				😊				

Insert shape	Sepcification	Dimension(mm)					Cast iron				Hardened steel					Powder alloy& Superalloy		
		ØI.C	S	ød	r	L	BK1011	BK1021	BK2511	BK2541	BH0121	BH1020	BH2011	BH2511	BH3511	BS1011	BS2011	BS3011
	VBGW160402AE-2	9.525	4.76	4.4	0.2	3.3	○	○								○	○	○
	VBGW160404AE-2	9.525	4.76	4.4	0.4	2.8	○	○								○	○	○
	VBGW160408AE-2	9.525	4.76	4.4	0.8	2.5	○	○								○	○	○
	VBGW160402AS01225-2	9.525	4.76	4.4	0.2	3.3					○	○	○	○		○	○	○
	VBGW160404AS01225-2	9.525	4.76	4.4	0.4	2.8					○	○	○	○		○	○	○
	VBGW160408AS01225-2	9.525	4.76	4.4	0.8	2.5					○	○	○	○		○	○	○
	VBGW160402AT01225-2	9.525	4.76	4.4	0.2	3.3	○	○								○	○	○
	VBGW160404AT01225-2	9.525	4.76	4.4	0.4	2.8	○	○								○	○	○
	VBGW160408AT01225-2	9.525	4.76	4.4	0.8	2.5	○	○								○	○	○

According to processing requirements, the size and number of non-standard tool nose arcs can be provided.

When using PCBN blades, please try to keep the cutting depth below. 0.5mm.

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

Applicable tool

SVJBR/L
Kr:93°



Page A189

SVABR/L
Kr:90°



A190

SVVBN
Kr:72°30'



A191

SVQBR/L
Kr:107°30'



A226

SVUBR/L
Kr:93°



A227

	Cast iron	Heat resistant alloy, Ti alloy	Super hard material	Non ferrous metal
Workpiece material				

[illegible]

When using PCBN blades, please try to keep the cutting depth below 0.5mm.

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

SVVCN
Kr:72°30'



Page A192

SVJCR/L
Kr:93°



A193

SVQCR/L
Kr:107°30'



A224

SVUCR/L
Kr:93°



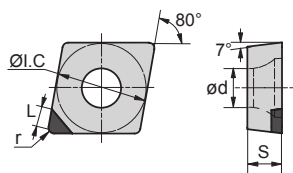
A225



General Turning Inserts

PCBN&PCD inserts

CC (Positive angle)



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

Workpiece material	K Cast iron				
	S Heat resistant alloy, Ti alloy				
	H Super hard material				
	N Non ferrous metal	😊	😊	😊	☹

Type	Shape	Specification	Dimension(mm)					Grade			
			ØI.C	S	ød	r	L	DN0121	DN0511	DN1021	DN3021
0° rake angle		CCGW060202AF	6.35	2.38	2.8	0.2	2.6	○	○	○	○
		CCGW060204AF	6.35	2.38	2.8	0.4	2.5	★	★	★	★
		CCGW060208AF	6.35	2.38	2.8	0.8	2.4	○	○	○	○
		CCGW09T302AF	9.525	3.97	4.4	0.2	2.6	○	○	○	○
		CCGW09T304AF	9.525	3.97	4.4	0.4	2.5	○	○	○	○
		CCGW09T308AF	9.525	3.97	4.4	0.8	2.4	★	★	★	★
		CCGW120402AF	12.7	4.76	5.5	0.2	2.6	○	○	○	○
		CCGW120404AF	12.7	4.76	5.5	0.4	2.5	○	○	○	○
		CCGW120408AF	12.7	4.76	5.5	0.8	2.4	★	★	★	★
7° rake angle		CCMX060202AF	6.35	2.38	2.8	0.2	2.6	○	○	○	○
		CCMX060204AF	6.35	2.38	2.8	0.4	2.5	○	○	○	○
		CCMX060208AF	6.35	2.38	2.8	0.8	2.4	○	○	○	○
		CCMX09T302AF	9.525	3.97	4.4	0.2	2.6	○	○	○	○
		CCMX09T304AF	9.525	3.97	4.4	0.4	2.5	○	○	○	○
		CCMX09T308AF	9.525	3.97	4.4	0.8	2.4	○	○	○	○
		CCMX120402AF	12.7	4.76	5.5	0.2	2.6	○	○	○	○
		CCMX120404AF	12.7	4.76	5.5	0.4	2.5	○	○	○	○
		CCMX120408AF	12.7	4.76	5.5	0.8	2.4	○	○	○	○

According to processing requirements, the size and number of non-standard tool nose arcs can be provided.

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

Applicable tool

SCACR/L
Kr:90°



Page A184

SCLCR/L
Kr:95°



A185

SCLCR/L
Kr:95°



A218

SCFCR/L
Kr:90°

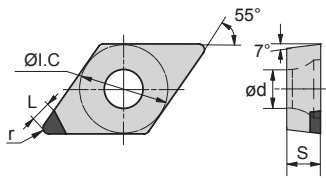


A232

SCLCR/L
Kr:95°



A233


DC (Positive angle)

 Good working condition
  Normal working condition
  Bad working condition

Workpiece material	K Cast iron				
	S Heat resistant alloy, Ti alloy				
	H Super hard material				
	N Non ferrous metal				

Type	Shape	Specification	Dimension(mm)					Grade			
			ØI.C	S	ød	r	L	DN0121	DN0511	DN1021	DN3021
0° rake angle		DCGW070202AF	6.35	2.38	2.8	0.2	2.7	○	○	○	○
		DCGW070204AF	6.35	2.38	2.8	0.4	2.5	○	○	○	○
		DCGW070208AF	6.35	2.38	2.8	0.8	2.1	★	★	★	★
		DCGW11T302AF	9.525	3.97	4.4	0.2	2.7	○	○	○	○
		DCGW11T304AF	9.525	3.97	4.4	0.4	2.5	○	○	○	○
		DCGW11T308AF	9.525	3.97	4.4	0.8	2.1	★	★	★	★
7° rake angle		DCMX070202AF	6.35	2.38	2.8	0.2	2.7	○	○	○	○
		DCMX070204AF	6.35	2.38	2.8	0.4	2.5	○	○	○	○
		DCMX070208AF	6.35	2.38	2.8	0.8	2.1	○	○	○	○
		DCMX11T302AF	9.525	3.97	4.4	0.2	2.7	○	○	○	○
		DCMX11T304AF	9.525	3.97	4.4	0.4	2.5	○	○	○	○
		DCMX11T308AF	9.525	3.97	4.4	0.8	2.1	○	○	○	○

According to processing requirements, the size and number of non-standard tool nose arcs can be provided.

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

Applicable tool

SDACR/L
Kr:90°


Page A186

SDJCR/L
Kr:93°


A187

SDNCN
Kr:62°30'


A188

SDQCR/L
Kr:107°30'


A219

SDUCR/L
Kr:93°


A220

SDZCR/L
Kr:95°


A221

 General
turning

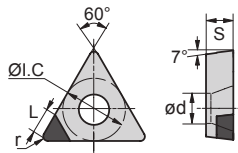
PCBN&PCD inserts



TURNING General Turning Inserts

PCBN&PCD inserts

TC (Positive inserts)



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

Workpiece material	K Cast iron				
	S Heat resistant alloy, Ti alloy				
	H Super hard material				
	N Non ferrous metal	😊	😊	😊	☹️

Type	Shape	Specification	Dimension(mm)					Grade			
			ØI.C	S	ød	r	L	DN0121	DN0511	DN1021	DN3021
0° rake angle		TCGW090202AF	5.56	2.38	2.5	0.2	2.5	○	○	○	○
		TCGW090204AF	5.56	2.38	2.5	0.4	2.5	○	○	○	○
		TCGW090208AF	5.56	2.38	2.5	0.8	2.2	★	★	★	★
		TCGW110202AF	6.35	2.38	2.8	0.2	2.5	○	○	○	○
		TCGW110204AF	6.35	2.38	2.8	0.4	2.5	○	○	○	○
		TCGW110208AF	6.35	2.38	2.8	0.8	2.2	★	★	★	★
7° rake angle		TCMX090202AF	5.56	2.38	2.5	0.2	2.5	○	○	○	○
		TCMX090204AF	5.56	2.38	2.5	0.4	2.5	○	○	○	○
		TCMX090208AF	5.56	2.38	2.5	0.8	2.2	○	○	○	○
		TCMX110202AF	6.35	2.38	2.8	0.2	2.5	○	○	○	○
		TCMX110204AF	6.35	2.38	2.8	0.4	2.5	○	○	○	○
		TCMX110208AF	6.35	2.38	2.8	0.8	2.2	○	○	○	○

According to processing requirements, the size and number of non-standard tool nose arcs can be provided.

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

Applicable tool

STACR/L
Kr:90°



Page A198

STFCR/L
Kr:90°



A198

STGCR/L
Kr:91°



A199

STECR/L
Kr:60°

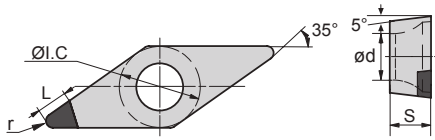


A200

STFCR/L
Kr:90°



A223


VB (Positive inserts)


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

Workpiece material	K Cast iron				
	S Heat resistant alloy, Ti alloy				
	H Super hard material				
	N Non ferrous metal	☺	☺	☹	☹

Type	Shape	Specification	Dimension(mm)					Grade			
			ØI.C	S	ød	r	L	DN0121	DN0511	DN1021	DN3021
0° rake angle		VBGW160402AF	9.525	4.76	4.4	0.2	3.3	○	○	○	○
		VBGW160404AF	9.525	4.76	4.4	0.4	2.8	○	○	○	○
		VBGW160408AF	9.525	4.76	4.4	0.8	2.5	★	★	★	★
5° rake angle		VBMX160402AF	9.525	4.76	4.4	0.2	3.3	○	○	○	○
		VBMX160404AF	9.525	4.76	4.4	0.4	2.8	○	○	○	○
		VBMX160408AF	9.525	4.76	4.4	0.8	2.5	○	○	○	○

According to processing requirements, the size and number of non-standard tool nose arcs can be provided.

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

General turning

PCBN&PCD inserts

Applicable tool

SVJBR/L
Kr:93°


Page A189

SVABR/L
Kr:90°


A190

SVVBN
Kr:72°30'


A191

SVQBR/L
Kr:107°30'


A226

SVUBR/L
Kr:93°

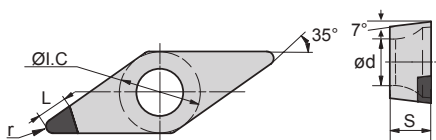

A227



General Turning Inserts

PCBN&PCD inserts

VC (Positive inserts)



😊 Good working condition 😐 Normal working condition 😞 Bad working condition

Workpiece material	K Cast iron				
	S Heat resistant alloy, Ti alloy				
	H Super hard material				
	N Non ferrous metal	😊	😊	😊	😊

Type	Shape	Specification	Dimension(mm)					Grade			
			ØI.C	S	ød	r	L	DN0121	DN0511	DN1021	DN3021
0° rake angle		VCGW160402AF	9.525	4.76	4.4	0.2	3.3	○	○	○	○
		VCGW160404AF	9.525	4.76	4.4	0.4	2.8	○	○	○	○
		VCGW160408AF	9.525	4.76	4.4	0.8	2.5	○	○	○	○
7° rake angl		VCMX160402AF	9.525	4.76	4.4	0.2	3.3	○	○	○	○
		VCMX160404AF	9.525	4.76	4.4	0.4	2.8	○	○	○	○
		VCMX160408AF	9.525	4.76	4.4	0.8	2.5	○	○	○	○

According to processing requirements, the size and number of non-standard tool nose arcs can be provided.

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

Applicable tool

SVVCN
Kr:72°30'



Page A192

SVJCR/L
Kr:93°



A193

SVQCR/L
Kr:107°30'



A224

SVUCR/L
Kr:93°



A225

**Abnormal failure and solutions for cast iron machining**

	Abnormal failure	Solution
Breakage	Breakage occurs on chamfer of rake face	Enlarge chamfered negative rake angle
	Edge crashing appears when finishing grey cast iron	
Abrasion	Abrasion occurs when machining nodular cast iron	Change to dry cutting
	Abrasion under dry cutting conditions	Reduce cutting speed
	Abrasion occurs when machining grey cast iron	Change to dry cutting, increase cutting speed
Surface quality	Bad surface finish	Increase cutting speed, increase nose radius, reduce feed rate
	Bad cylindricity and coaxiality	Reduce nose radius, improve stability, change to positive insert
	Burrs	Change to positive insert, reduce chamfer width

Abnormal failure and solutions for hardened steel

	Abnormal failure	Solution
Breakage	Cutting edge breakage	Enlarge chamfered negative rake angle; raise cutting speed and reduce feed
	Flaking and crater wear on rake face	Reduce cutting speed
	Thermal cracks	Change to dry cutting; reduce cutting speed
Abrasion	Wear occurs on chamfer of rake face	Reduce cutting speed
	Rapid wear when finishing grey cast iron	
Surface quality	Bad surface finish	Vibration Reduce chamfered negative rake angle; reduce nose radius; reduce feed rate; improve stability
		Tool mark Increase nose radius; reduce feed rate; change to dry cutting; increase cutting speed
	Bad cylindricity and coaxiality	Reduce nose radius; improve stability; change to positive insert



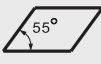
TURNING

General Turning Inserts

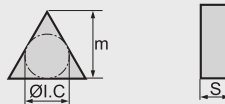
Ceramic inserts

Ceramic inserts code key

Insert shape

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

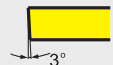
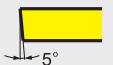
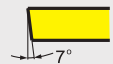
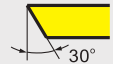
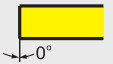
Tolerance class



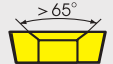
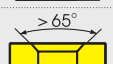
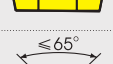
Code	Nose height M Tolerance(mm)	Inscribed circle Tolerance(mm)	Thickness S Tolerance(mm)	Code	Nose height M Tolerance(mm)	Inscribed circle Tolerance(mm)	Thickness S Tolerance(mm)
A	±0.005	±0.025	±0.025	J	±0.005	±0.05±0.13	±0.025
F	±0.005	±0.013	±0.025	K	±0.013	±0.05±0.13	±0.025
C	±0.013	±0.025	±0.025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

R P G N

Clearance angle of main cutting edge

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

Chipbreaker and clamping system

Code	With/Without hole	Section plane of insert
N	Without	
B	With	 > 65°
C	With	 > 65°
A	With	
W	With	 ≤ 65°
Q	With	 ≤ 65°
X	---	Special



Length of cutting edge						
Diameter of IC (mm)	Insert shape					
	C	D	S	T	V	W
3.97				06		
5.0						
5.56				09		
6.0						
6.35	06	07		11	11	
8.0						
9.525	09	11	09	16	16	06
10.0						
12.0						
12.7	12	15	12	22	22	08
15.875	16		15	27		
16.0		19				
19.05	19		19	33		
20.0						
25.0	25	25				
25.4			25			
31.75						
32						

Insert thickness			
Code	Insert thickness(mm)	Code	Insert thickness(mm)
02	2.38	06	6.35
T2	2.58	T6	6.75
03	3.18	07	7.94
T3	3.97	09	9.52
04	4.76	T9	9.72
T4	4.96	11	11.11
05	5.56	12	12.70
T5	5.95		

Nose radius code	
Code	Nose radius(mm)
00	No radius
02	0.2
04	0.4
08	0.8
12	1.2
16	1.6
20	2.0
24	2.4
32	3.2
X	Others
Diameter of insert (Metric)	Round insert

General turning

Ceramic inserts code key

09 07 00 T 010 20 - V

Type of cutting edge		
Code	Type of cutting edge	Picture
E	Honing	
T	Chamfering	
S	Chamfering + honing	
F	Sharp edges	

Chamfer width (mm)			
010	0.10	040	0.40
015	0.15	045	0.45
020	0.20	050	0.50
025	0.25	100	1.00
030	0.30	200	2.00
035	0.35		

Chamfer angle	
05	5°
10	10°
15	15°
20	20°
25	25°
30	30°

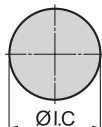
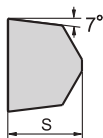
V-type positioning surface



General Turning Inserts

Ceramic inserts

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



Workpiece material	K Cast iron	☹️
	S Heat resistant alloy	😐
	H Super hard material	😊

Inserts shape	Type	Dimensions(mm)		Grade
		ØI.C	S	CN3100
	RCGN090700T01015-V	9.525	7.94	○
	RCGN090700T01520-V	9.525	7.94	○
	RCGN090700T01020-V	9.525	7.94	●
	RCGN120700T01015-V	12.7	7.94	○
	RCGN120700T01020-V	12.7	7.94	○
	RCGN120700T01520-V	12.7	7.94	○

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

Applicable tool

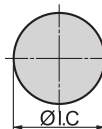
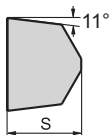
1 **CRDCR/L**



Page A205

2. Tailor-made nonstandard CRXCR

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



Workpiece material	K Cast iron	☹️
	S Heat resistant alloy	😐
	H Super hard material	😊

Inserts shape	Type	Dimensions(mm)		Grade
		ØI.C	S	CN3100
	RPGN090700T01015-V	9.525	7.94	○
	RPGN090700T01520-V	9.525	7.94	○
	RPGN090700T01020-V	9.525	7.94	●
	RPGN120700T01015-V	12.7	7.94	○
	RPGN120700T01020-V	12.7	7.94	○
	RPGN120700T01520-V	12.7	7.94	○

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

Applicable tool

1 **CRDPR/L**



Page A205

2. Tailor-made nonstandard CRXCR

***D*-type**
double-clamping tool holder





General Turning Tools

Applications sketch map of turning tools

External and internal turning

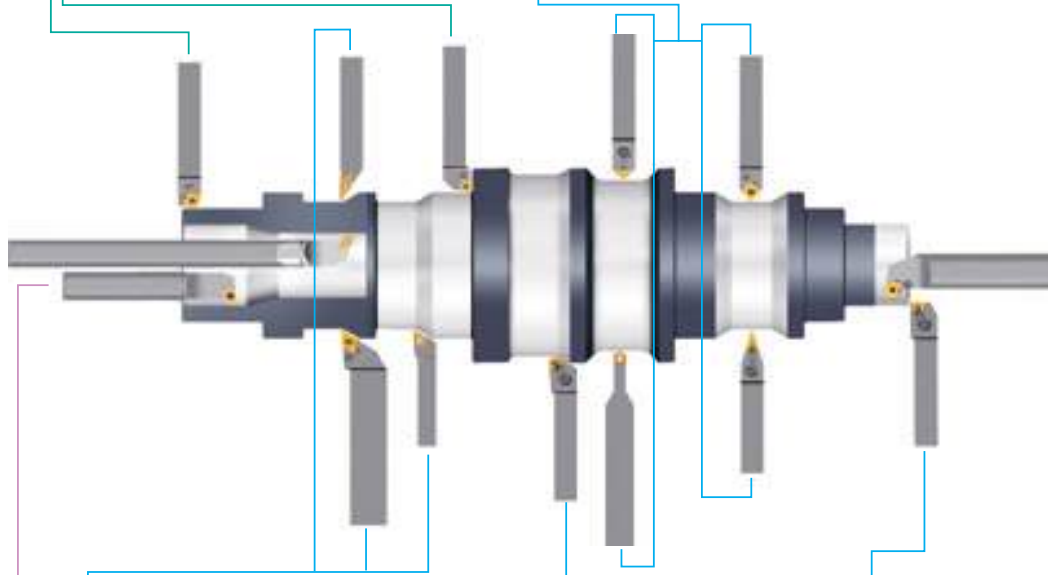
General turning

Applications sketch map of turning tools

External turning	Tool holder type						
	DTGNR/L□□	DSBNR/L□□	PCBNR/L□□	PSBNR/L□□	PSSNR/L□□	PTGNR/L□□	PTTNR/L□□
	SCACR/L□□	SSBCR/L□□	SSSCR/L□□	STACR/L□□	STGCR/L□□	STECR/L□□	SWACR/L□□

External and end surface turning	Tool holder type	
	DCLNR/L□□	DWLNRL/L□□
	PCLNR/L□□	PWLNRL/L□□
	SCLCR/L□□	

Profile turning	Tool holder type			
	DVNN□□	PDPNN□□	PSDNN□□	SDNCN□□
	SVVBN□□	SVVCN□□	SSDCN□□	SRDCN□□
	CKNNR/L□□			



Profile turning	Tool holder type					
	DDJNR/L□□	DVJNR/L□□	PDJNR/L□□			
	SDACR/L□□	SDJCR/L□□	SVABR/L□□			
	SVJBR/L□□	SVJCR/L□□	CKJNR/L□□			

Profile turning	Tool holder type
	SRGCR/L□□

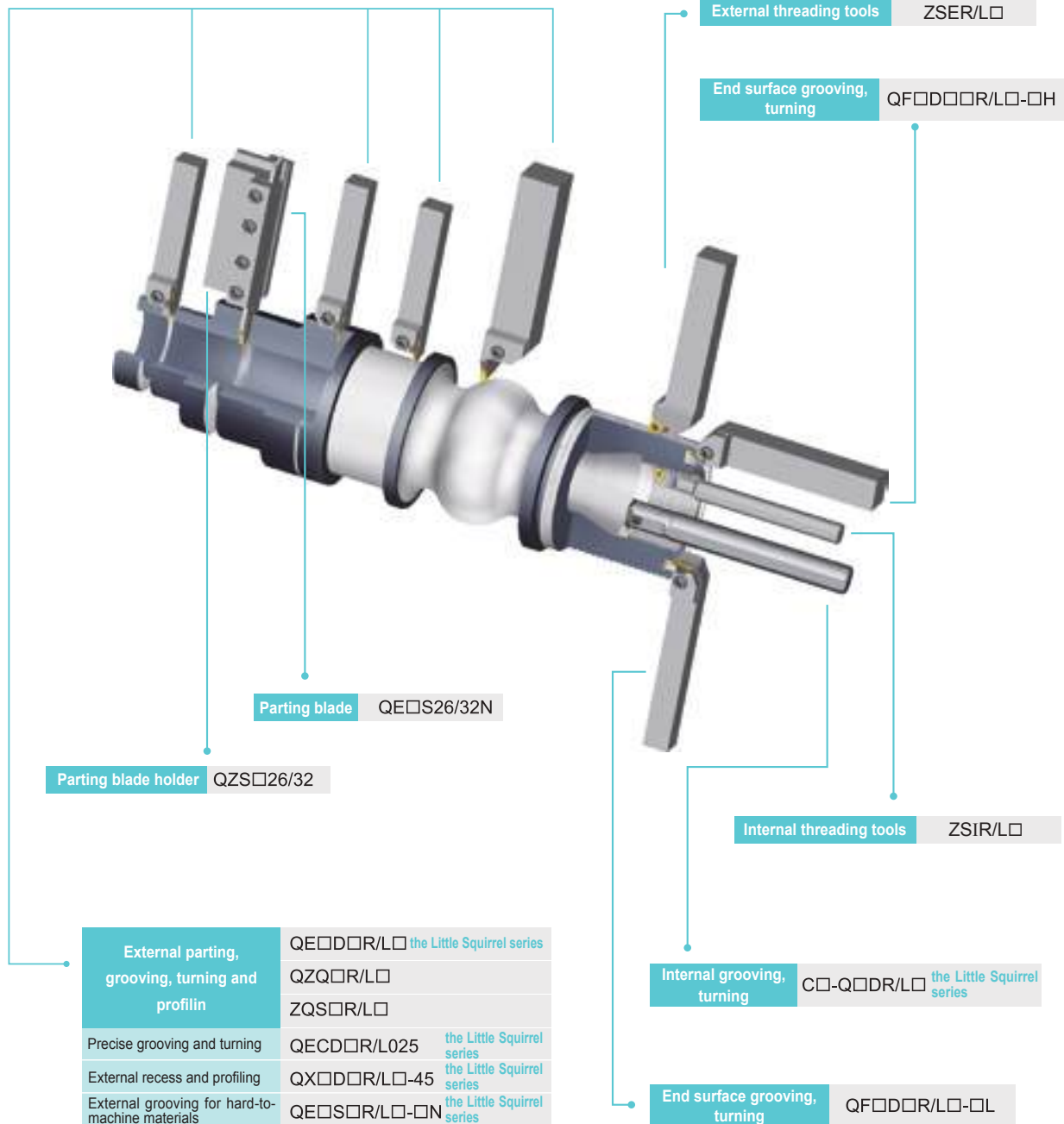
End surface turning	Tool holder type	
	PSKNR/L□□	PTFNR/L□□
	SSKCR/L□□	STFCR/L□□

Tool holders for internal turning (Steel tool shank)						
	S□-PSKNR/L□	S□-PCLNR/L□	S□-PDPNR/L□	S□-PDUNR/L□	S□-SDQCR/L□	S□-SDZCR/L□
	S□-PTFNR/L□	S□-PWLNRL/L□		S□-SDUCR/L□	S□-SDQPR/L□	
	S□-SCFCR/L□	S□-SCLCR/L□		S□-SDUPR/L□	S□-SVQBR/L□	
	S□-SSKCR/L□	S□-SCLPR/L□		S□-SVUBR/L□	S□-SVQCR/L□	
	S□-STFCR/L□			S□-SVUCR/L□		
	S□-STUPR/L□					

Tool holders for internal turning (Cemented carbide tool shank)				
	C□-STUPR/L□	C□-SCLPR/L□	C□-SDUPR/L□	C□-SDQPR/L□
			C□-SVUCR/L□	C□-SVQCR/L□



● Parting, grooving and threading tools



General turning

Applications sketch map of turning tools



General Turning Tools

How to select external turning tools

How to select external turning tools

Explanation of external turning tools detailed table

- Listed according to clamping types.

Approach angle of tools

Tools type

The first 4 letters in the type description stands for tool shape and application

Inserts type

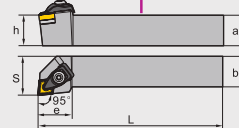
Specification chart

Application chart

The arrow shows suitable applications such as external turning, profiling and end turning, etc.

Corresponding tool holders of insert **CN** ☐ ☐ **D-type clamping**

DCLNR/L
Kr:95°



Type	Stock		Basic dimensions(mm)						Screw	Shim	Wrench	Clamp	Shim screw	Spring
	R	L	a	b	L	h	s	e						
DCLNR/L	▲	△	16	16	100	16	20	24						
	▲	△	20	20	125	20	25	24	CM5×22C	C09BM	WH30L	C1RA	SM5×8.65XA1	SPR6
	▲	△	25	25	150	25	32	24						
	▲	△	20	20	125	20	25	28						
	▲	△	25	25	150	25	32	28	CM6×25C	C12BM	WH40L	C2RA	SM6×10XA1	SPR4
	▲	△	32	25	170	32	32	28						

▲ Stock available △ Make-to-order

Applicable inserts							
Application		For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining	PCBN&PCD inserts
Inserts shape	DF Wiper A54	WGM Wiper A55	DR Double side A58	HDR A59	Without chipbreaker A59		A118
	WGF Wiper A54	PM A55	DR Single side A58	HPR A59			A118 -A119
	SF A54	DM A56	ER Double side A58				A119
	EF A54	EM A56	ER Single side A58				
	NF A55	NM A57	SNR Double side A58				
			LR Single side A57				
Tool holder type	DCLNR/L□□H/K/M09	CN□□0903□□	CN□□0903□□				
	DCLNR/L□□K/M/P12	CN□□1204□□	CN□□1204□□	CN□□1204□□	CN□□1204□□	CN□□1204□□	CN□□1204□□

Products specification

Including product description, stock (left and right hand), basic dimensions and applicable spare parts.

Applicable inserts

Including applications of inserts, reference page, insert shape and corresponding tool holders.



TURNING

External Turning >>> Tools

External turning tools overview • A158-A161

External turning tools code key • A162-A163

Detailed table of external turning tools • A166-A204

External turning tool holders by D type clamping • A166-A171

External turning tool holders by P type clamping • A172-A183

External turning tool holders by S type clamping • A184-A203

External turning tool holders by C type clamping • A204

**Detailed table of external turning tools
(ceramic)** • A205





TURNING

General Turning Tools

External turning tools overview

General
turning

External turning tools overview

Clamping system	Tool type	Approach angle(Kr°)	Turning type						Applicable workpiece shape		Page
			External turning	End surface turning	External and end surface turning	Profile turning	Profile turning	Profile turning	Short, Thick	Thin, Long	
D	DCLNR/L	95			☺				☺		A166
	DDJNR/L	93					☺		☺	☺	A167
	DSBNR/L	75	☺						☺		A168
	DTGNR/L	91	☺						☺	☺	A169
	DVVNN	72.5						☺	☺		A170
	DVJNR/L	93					☺		☺	☺	A170
	DWLNR/L	95			☺				☺		A171
P	PCBNR/L	75	☺						☺		A172
	PCLNR/L	95			☺				☺		A173
	PDJNR/L	93					☺		☺	☺	A174
	PDPNN	62.5						☺	☺		A175

☺ Recommended ☺ Available



Clamping system	Tool type	Approach angle(Kr°)	Turning type						Applicable workpiece shape		Page
			External turning	End surface turning	External and end surface turning	Profile turning	Profile turning	Profile turning	Short, Thick	Thin, Long	
											
P	 PSBNR/L	75	☺						☺		A176
	 PSDNN	45						☺	☺		A177
	 PSKNR/L	75		☺					☺		A178
	 PSSNR/L	45	☺						☺		A179
	 PTFNR/L	90		☺					☺	☺	A180
	 PTTNR/L	60	☺						☺		A181
	 PTGNR/L	90	☺						☺	☺	A182
	 PWLNR/L	95			☺				☺		A183
S	 SCACR/L	90	☺						☺	☺	A184
	 SCLCR/L	95			☺				☺	☺	A185
	 SDACR/L	90					☺		☺	☺	A186

☺ Recommended ☹ Available



TURNING

General Turning Tools

External turning tools overview

General
turning

External turning tools overview

Clamping system	Tool type	Approach angle (K°)	Turning type						Applicable workpiece shape		Page
			External turning	End surface turning	External and end surface turning	Profile turning	Profile turning	Profile turning	Short, Thick	Thin, Long	
S	SDJCR/L	93					☺		☺	☺	A187
	SDNCN	62.5						☺	☺	☺	A188
	SVJBR/L	93					☺		☺	☺	A189
	SVABR/L	90					☺		☺	☺	A190
	SVVBN	72.5						☺	☺	☺	A191
	SVVCN	72.5						☺	☺	☺	A192
	SVJCR/L	93					☺		☺	☺	A193
	SSBCR/L	75	☺						☺		A194
	SSDCN	45						☺	☺		A195
	SSKCR/L	75		☺					☺		A196
	SSSCR/L	45	☺						☺		A197

☺ Recommended ☹ Available



Clamping system	Tool type	Approach angle(K°)	Turning type						Applicable workpiece shape		Page
			External turning	End surface turning	External and end surface turning	Profile turning	Profile turning	Profile turning	Short, Thick	Thin, Long	
											
S	STACR/L 	90	☺						☺	☺	A198
	STFCR/L 	90		☺					☺		A198
	STGCR/L 	91	☺						☺	☺	A199
	STECR/L 	60	☺						☺		A200
	SWACR/L 	90	☺						☺	☺	A201
	SRDCN 	--						☺	☺		A202
	SRGCR/L 	--				☺			☺		A203
C	CKJNR/L 	93					☺		☺		A204
	CKNNR/L 	63						☺	☺		A204
	CRDCR/L CRDPR/L 	--					☺		☺		A205

☺ Recommended

☹ Available



TURNING

General Turning Tools

External turning tools code key

General turning

External turning tools code key

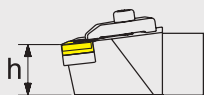
Clamping system	Insert shape		Clearance angle of insert	Cutting direction
D – double clamping	C	D	B	L – Left-hand
P – Hole clamping	R	S	C	R – Right-hand
S – Screw on	T	V	D	R – Right-hand
C – Top clamping	W		E	N – Right and left hand
			N	
			P	

P C L N L

Tool holder style and approach angle							
A	B	C	D	E	F	G	H
J	K	L	M	N	O	P	Q
R	S	T	U	V	W	X	



Nose height (mm)



Code	Height
------	--------

12	12
16	16
20	20
25	25
32	32
40	40
50	50

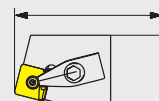
Width of tool holder (mm)



Code	Width
------	-------

12	12
16	16
20	20
25	25
32	32
40	40
50	50

Length of tool holder (mm)



Code	Length
------	--------

E	70
F	80
H	100
K	125
M	150
P	170
Q	180
R	200
S	250
T	300

General turning

External turning tools code key

25

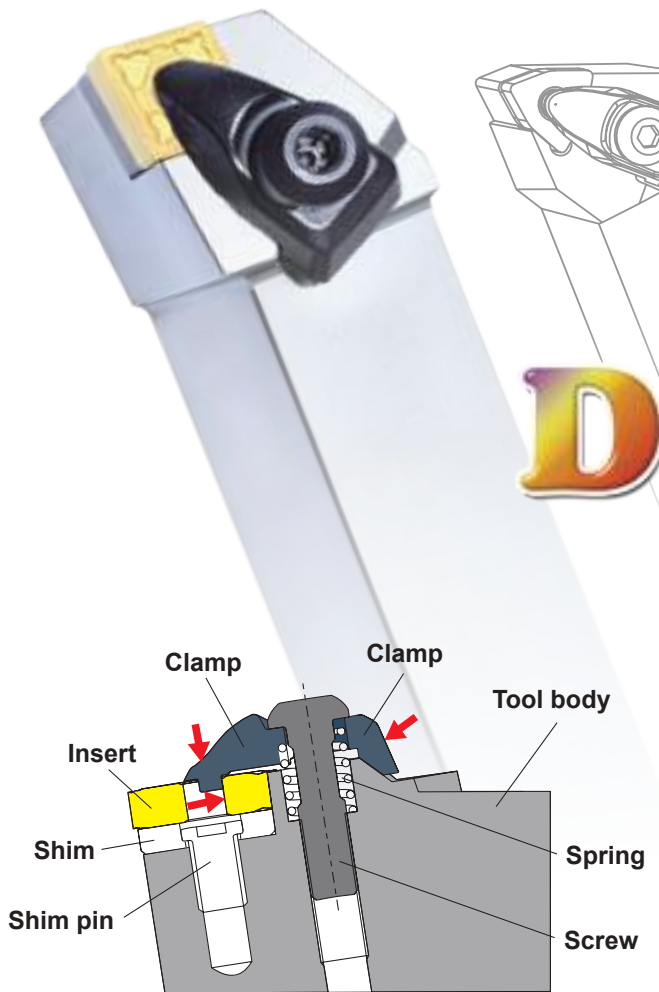
25

M

12

Length of cutting edge

Inserts shape	C	D	R	S	T	V	W
Inscribed circle (mm)	Length of cutting edge(mm)						
5.556	---	---	---	---	09	---	---
6.350	06	07	---	---	11	---	---
9.525	09	11	09	09	16	16	06
12.700	12	15	12	12	22	22	08
15.875	16	19	15	15	27	---	---
19.050	19	---	19	19	33	---	---
25.400	25	---	25	25	44	---	---
32.000	---	---	32	---	---	---	---



D

-type double-clamping tool holder

With newly developed double-clamping structure, D-type turning tools have high clamping rigidity and high positioning accuracy, achieving easy and secure clamping of inserts. It is the best choice for the clamping of straight hole negative inserts.

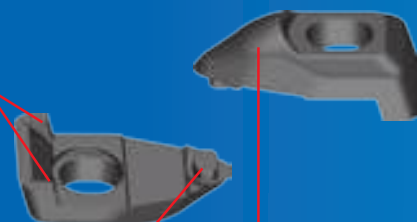
Convenient secure clamping device



Slots in the tool body match perfectly with the clamp, realizing simple and easy clamping.

Uniquely clamp

The clamp and the inner wall of insert hole make an arc contact. The stable and evenly distributed clamping force ensures more secure clamping.



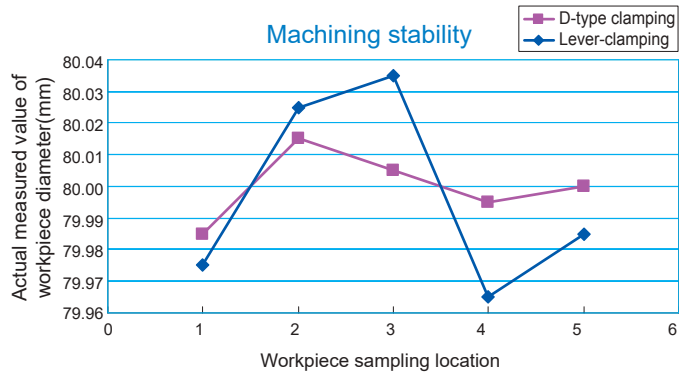
lug boss on both ends and double-locating make more insert clamp secure .

Arc locating surface makes large contact area and the force is evenly distributed.

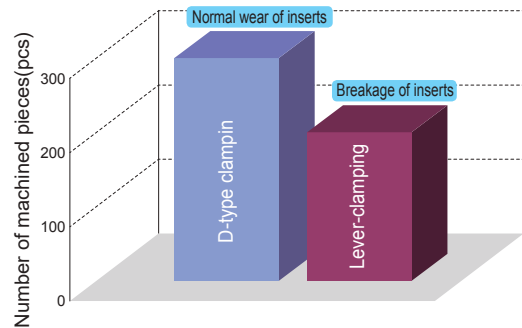
Simple and compact structure effectively prevents chip blocking while ensuring high clamping rigidity.

Compared with lever-clamping:

① Accurate locating ensures more stable machining accuracy.



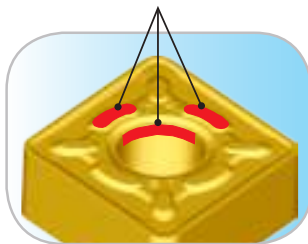
② High clamping rigidity effectively improves resistance to breakage of insert.



Compared with similar products of company A:

① Locating surface contact: (checking the contact location of clamp by dyeing)

Force evenly distributed, firm clamping, high locating accuracy.



ZCC-CT



Similar product of company A

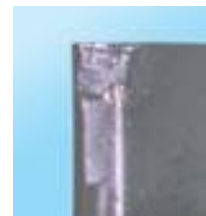
② Effect on tool life:

Tool holder: DCLNL3225P12
 Insert: YBC252/CNMG120408-DR
 Cutting material: 45# steel
 Cutting parameters: $V_c=250\text{m/min}$
 $a_p=2\text{mm}$
 $f=0.6\text{mm/r}$

After 60 minutes of cutting



ZCC-CT



Similar product of company A



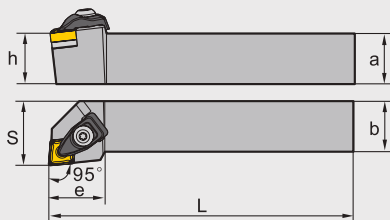
TURNING / General Turning Tools

External turning tools

Corresponding tool holders of insert **CN** ☐ ☐ D-type clamping

DCLNR/L

Kr:95°



Type		Stock		Basic dimensions(mm)					Screw	Shim	Wrench	Clamp	Shim screw	Spring
		R	L	a	b	L	h	s						
DCLNR/L	1616H09	▲	△	16	16	100	16	20	24					
	2020K09	▲	△	20	20	125	20	25	24	CM5×22C	C09BM	WH30L	C1RA	SM5×8.65XA1 SPR6
	2525M09	▲	△	25	25	150	25	32	24					
	2020K12	▲	▲	20	20	125	20	25	28					
	2525M12	▲	▲	25	25	150	25	32	28	CM6×25C	C12BM	WH40L	C2RA	SM6×10XA1 SPR4
	3225P12	▲	▲	32	25	170	32	32	28					

▲Stock available

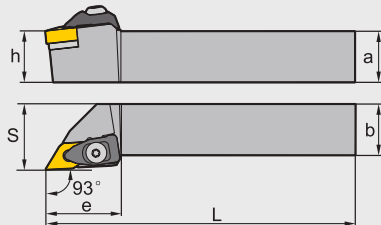
△Make-to-order

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining	PCBN&PCD inserts
Inserts shape	DF Wiper A54	WGM Wiper A55	DR Double-side A58	HDR A59	Without chipbreaker A59	A118
	WGF Wiper A54	PM A55	DR Single-side A58	HPR A59		A118 -A119
	SF A54	DM A56	ER Double-side A58			A119
	EF A54	EM A56	ER Single-side A58			
	NF A55	NM A57	SNR Double-side A58			
			LR Single-side A57			

Tool holder type

DCLNR/L □□H/K/M09	CN□□0903□□	CN□□0903□□				
DCLNR/L □□K/M/P12	CN□□1204□□	CN□□1204□□	CN□□1204□□	CN□□1204□□	CN□□1204□□	CN□□1204□□

Corresponding tool holders of insert **DN** ☐ ☐ D-type clamping**DDJNR/L****Kr:93°**

Type		Stock		Basic dimensions(mm)						Screw	Shim	Wrench	Clamp	Shim screw	Spring
		R	L	a	b	L	h	s	e						
DDJNR/L	1616H11	△	△	16	16	100	16	20	30	CM5×22C	D11BM	WH30L	C1RA	SM5×8.65XA1	SPR6
	2020K11	▲	△	20	20	125	20	25	30						
	2525M11	▲	△	25	25	150	25	32	30						
	3225P11	△	△	32	25	170	32	32	30						
	2020K15	▲	▲	20	20	125	20	25	35	CM6×25C	D15BM	WH40L	C2RA	SM6×10XA1	SPR4
	2525M15	▲	▲	25	25	150	25	32	35						
	3232P15	▲	▲	32	32	170	32	40	35						

▲Stock available

△Make-to-order

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining	PCBN&PCD inserts
Inserts shape	DF A61	WGM Wiper A63	DR Double-side A65	HDR A66	Without chipbreaker A66	A121 -A122
	WGF Wiper A61	PM A63	DR Single-side A65			A122 -A123
	SF A62	DM A64	ER Double-side A65			A124
	EF A62	EM A64	ER Single-side A65			
	NF A62	NM A64	SNR Double-side A65			
	NGF A62		LR Single-side A65			
Tool holder type	DDJNR/L□□H/K/M/P11	DN□□1104□□	DN□□1104□□		DN□□1104□□	
	DDJNR/L□□K/M/P15	DN□□1506□□	DN□□1506□□	DN□□1506□□	DN□□1506□□	DN□□1506□□

General turning

External turning tools



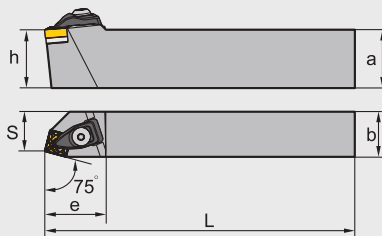
TURNING General Turning Tools

External turning tools

Corresponding tool holders of insert **SN** ☐ ☐ D-type clamping

DSBNR/L

Kr:75°



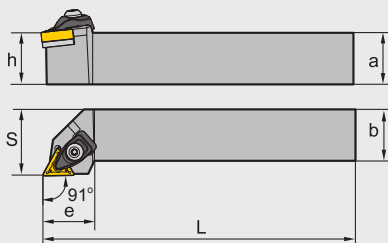
Type		Stock		Basic dimensions(mm)					Screw	Shim	Wrench	Clamp	Shim screw	Spring	
		R	L	a	b	L	h	s	e						
DSBNR/L	1616H09	▲	△	16	16	100	16	13	26	CM5×22C	S09BM	WH30L	C1RA	SM5×8.65XA1	SPR6
	2020K12	▲	▲	20	20	125	20	17	34						
	2525M12	▲	▲	25	25	150	25	22	34	CM6×25C	S12BM	WH40L	C2RA	SM6×10XA1	SPR4
	3225P12	▲	▲	32	25	170	32	22	34						
	3232P15	▲	▲	32	32	170	32	27	41	CM6×25C	S15BM	WH40L	C3RA	SM6×10XA2	SPR4

▲Stock available

△Make-to-order

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining	PCBN&PCD inserts
Inserts shape	DF  A67	PM  A68	DR Double-side  A70	HDR  A72	Without chipbreaker  A74	 A126
	EF  A67	DM  A68	DR Single-side  A70 -71	HPR  A72		 A127
	SF  A67	EM  A69	ER Double-side  A71			 A128
		NM  A69	ER Single-side  A71			
			SNR Double-side  A71			
			LR Single-side  A69			
Tool holder type	DSBNR/L□□H09	SN□□0903□□	SN□□0903□□		SN□□0903□□	
	DSBNR/L□□K/M/P12	SN□□1204□□	SN□□1204□□	SN□□1204□□	SN□□1204□□	SN□□1204□□
	DSBNR/L□□P15	SN□□1506□□	SN□□1506□□	SN□□1506□□	SN□□1506□□	

Corresponding tool holders of insert **TN** ☐ ☐ D-type clamping**DTGNR/L****Kr:91°**

Type		Stock		Basic dimensions(mm)						Screw	Shim	Wrench	Clamp	Shim screw	Spring
		R	L	a	b	L	h	s	e						
DTGNR/L	1616H16	△	△	16	16	100	16	20	25						
	2020K16	▲	▲	20	20	125	20	25	25	CM5×22C	T16BM	WH30L	C1RA	SM5×8.65XA1	SPR6
	2525M16	▲	▲	25	25	150	25	32	25						

▲Stock available

△Make-to-order

General turning

External turning tools

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining	PCBN&PCD inserts
Inserts shape	DF A75	WGM Wiper A76	DR Double-side A78	HDR A79	Without chipbreaker A80	A130
	WGF Wiper A75	PM A76	DR Single-side A78			A130 -A131
	SF A75	DM A77	ER Double-side A78			A131
	EF A76	EM A77	SNR Double-side A78			
			LR Single-side A77			
Tool holder type	DTGNR/L □□H/K/M16	TN□□1604□□	TN□□1604□□	TN□□1604□□	TN□□1604□□	TN□□1604□□



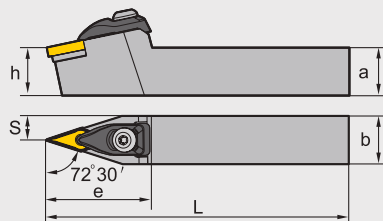
General Turning Tools

External turning tools

Corresponding tool holders of insert **VN** ☐ ☐ D-type clamping

DVVNN

Kr:72°30'

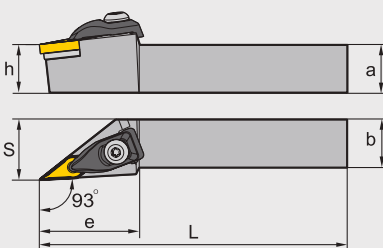


Type		Stock	Basic dimensions(mm)						Screw	Shim	Wrench	Clamp	Shim screw	Spring
			a	b	L	h	s	e						
DVVNN	2020K16	△	20	20	125	20	10	44	CM5×22C	V16BM	WH30L	C6RA	SM5×8.65XA1	SPR6
	2525M16	▲	25	25	150	25	12.5	44						

▲Stock available △Make-to-order

DVJNR/L

Kr:93°

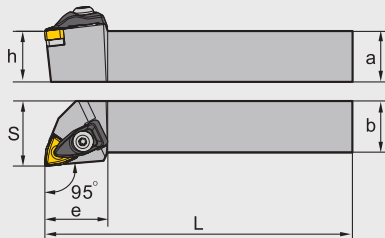


Type		Stock		Basic dimensions(mm)						Screw	Shim	Wrench	Clamp	Shim screw	Spring
		R	L	a	b	L	h	s	e						
DVJNR/L	2020K16	▲	▲	20	20	125	20	25	41	CM5×22C	V16BM	WH30L	C6RA	SM5×8.65XA1	SPR6
	2525M16	▲	▲	25	25	150	25	32	41						

▲Stock available △Make-to-order

Applicable inserts

Application	For finishing		For semi-finishing		For roughing		PCBN&PCD inserts	
Inserts shape	DF	 A81	PM	 A82	SNR	 A82	 A133	
	EF	 A81	DM	 A82			 A133-A134	
	SF	 A81	EM	 A82			 A134	
	NF	 A81	NM	 A82				
	NGF	 A81						
Tool holder type	DVVNN □□K/M16		VN□□1604□□		VN□□1604□□		VN□□1604□□	
	DVJNR/L □□K/M16		VN□□1604□□		VN□□1604□□		VN□□1604□□	

Corresponding tool holders of insert **WN** ☐ ☐ D-type clamping**DWLNRL****Kr:95°**

Type		Stock		Basic dimensions(mm)						Screw	Shim	Wrench	Clamp	Shim screw	Spring
		R	L	a	b	L	h	s	e						
DWLNRL	1616H06	▲	△	16	16	100	16	25	25						
	2020K06	▲	▲	20	20	125	20	25	24	CM5×22C	W06BM	WH30L	C1RA	SM5×8.65XA1	SPR6
	2525M06	▲	▲	25	25	150	25	32	24						
	2020K08	▲	▲	20	20	125	20	25	31						
	2525M08	▲	▲	25	25	150	25	32	31	CM6×25C	W08BM	WH40L	C2RA	SM6×10XA1	SPR4
	3225P08	△	△	32	25	170	32	32	31						

▲Stock available

△Make-to-order

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For cast iron machining	PCBN&PCD inserts
Inserts shape	DF  A83	WGM Wiper  A84	DR Double-side  A86	Without chipbreaker  A86	 A136
	WGF Wiper  A83	PM  A85	SNR Double-side  A86		 A136 -A137
	SF  A83	DM  A85			 A137
	EF  A84	EM  A85			
	NF  A84	NM  A86			
Tool holder type	DWLNRL □□H/K/M06	WN□□0604□□	WN□□0604□□	WN□□0604□□	WN□□0604□□
	DWLNRL □□K/M/P08	WN□□0804□□	WN□□0804□□	WN□□0804□□	WN□□0804□□

General turning

External turning tools



TURNING / General Turning Tools

External turning tools

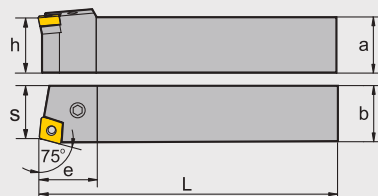
Corresponding tool holders of insert **CN** ☐ ☐ P-type clamping

PCBNR/L

Kr:75°



R-type shown



Type		Stock		Basic dimensions(mm)						Screw	Shim	Wrench	Lever	Shim pin
		R	L	a	b	L	h	s	e					
PCBNR/L	2020K12	▲	▲	20	20	125	20	17	27	LEM8×21	C12AP	WH30L	L4	SP4
	2525M12	▲	▲	25	25	150	25	22	27					
	3232P12	▲	▲	32	32	170	32	27	33					
	2525M16	▲	▲	25	25	150	25	22	33	LEM8×25	C16AP	WH30L	L5	SP5
	3232P16	▲	▲	32	32	170	32	27	33					
	4040R16	▲	▲	40	40	200	40	35	38					
	3232P19	▲	▲	32	32	170	32	27	38	LEM10×27	C19AP	WH40L	L6	SP6
	4040R19	▲	▲	40	40	200	40	35	40					
	4040S2507	▲	▲	40	40	250	40	35	50		C25AP-07	WH50L	L8	SP8
	4040S2509	▲	▲	40	40	250	40	35	50	LEM12×36A	C25AP			

▲Stock available

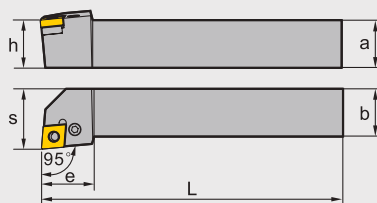
△Make-to-order

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining
Inserts shape	DF A54	WGM Wiper A55	DR Double-side A58	HDR A59	Without chipbreaker A59
	WGF Wiper A54	PM A55	DR Single-side A58	HPR A59	
	SF A54	DM A55	ER Double-side A58		
	EF A54	EM A56	ER Single-side A58		
	NF A55	NM A57	SNR Double-side A58		
			LR Single-side A57		
Tool holder type	PCBNR/L□□K/M/P12	CN□□1204□□	CN□□1204□□	CN□□1204□□	CN□□1204□□
	PCBNR/L□□M/P/R16	CN□□1606□□	CN□□1606□□	CN□□1606□□	CN□□1606□□
	PCBNR/L□□P/R19		CN□□1906□□	CN□□1906□□	CN□□1906□□
	PCBNR/L□□S2507		CN□□2507□□		
	PCBNR/L□□S2509		CN□□2509□□		

Corresponding tool holders of insert **CN** ☐ ☐ P-type clamping**PCLNR/L****Kr:95°**

R-type shown



Type		Stock		Basic dimensions(mm)						Screw	Shim	Wrench	Lever	Shim pin
		R	L	a	b	L	h	s	e					
PCLNR/L	2020K12	▲	▲	20	20	125	20	25	28	LEM8×21	C12AP	WH30L	L4	SP4
	2525M12	▲	▲	25	25	150	25	32	28					
	3225P12	△	△	32	25	170	32	32	33					
	3232P12	▲	▲	32	32	170	32	40	28					
	2525M16	▲	▲	25	25	150	25	32	33	LEM8×25	C16AP	WH30L	L5	SP5
	3225P16	△	△	32	25	170	32	32	33					
	3232P16	▲	▲	32	32	170	32	40	33					
	4040R16	△	△	40	40	200	40	50	42					
	3232P19	▲	▲	32	32	170	32	40	38	LEM10×27	C19AP	WH40L	L6	SP6
	4040R19	▲	▲	40	40	200	40	50	40					
	4040S2507	▲	▲	40	40	250	40	50	49	LEM12×36A	C25AP-07	WH50L	L8	SP8
	4040S2509	▲	▲	40	40	250	40	50	49		C25AP			

▲Stock available

△Make-to-order

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining	PCBN&PCD inserts
Inserts shape	DF Wiper A54	WGM Wiper A55	DR Double-side A58	HDR A59	Without chipbreaker A59	A118
	WGF Wiper A54	PM A55	DR Single-side A58	HPR A59		A118 -A119
	SF A54	DM A56	ER Double-side A58			A119
	EF A54	EM A56	ER Single-side A58			
	NF A55	NM A57	SNR Double-side A58			
			LR Single-side A57			

Tool holder type

PCLNR/L□□K/M/P12	CN□□1204□□	CN□□1204□□	CN□□1204□□	CN□□1204□□	CN□□1204□□	CN□□1204□□
PCLNR/L□□M/P/R16	CN□□1606□□	CN□□1606□□	CN□□1606□□	CN□□1606□□	CN□□1606□□	
PCLNR/L□□P/R19		CN□□1906□□	CN□□1906□□	CN□□1906□□	CN□□1906□□	
PCLNR/L□□S2507			CN□□2507□□			
PCLNR/L□□S2509			CN□□2509□□			

General turning

External turning tools



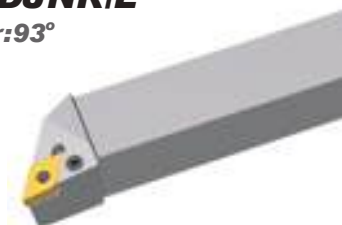
General Turning Tools

External turning tools

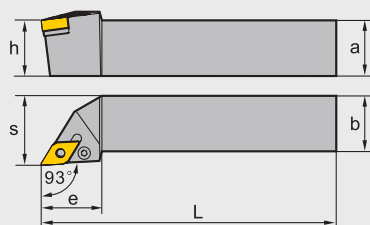
Corresponding tool holders of insert **DN** ☐ ☐ P-type clamping

PDJNR/L

Kr:93°



R-type shown



Type		Stock		Basic dimensions(mm)						Screw	Shim	Wrench	Lever	Shim pin
		R	L	a	b	L	h	s	e					
PDJNR/L	1616H11	▲	▲	16	16	100	16	20	25	LEM6 × 17	D11AP	WH25L	L3	SP3
	2020K11	▲	▲	20	20	125	20	25	25					
	2525M11	▲	▲	25	25	150	25	32	30					
	2020K15	▲	▲	20	20	125	20	25	35					
	2525M15	▲	▲	25	25	150	25	32	35	LEM8 × 21	D15AP	WH30L	L4B	SP4
	3232P15	▲	▲	32	32	170	32	40	35					
	2020K15-3	▲	△	20	20	125	20	25	35	LEM8 × 21	D15AP	WH30L	L4	SP4
	2525M15-3	▲	▲	25	25	150	25	32	35					
	3232P15-3	▲	△	32	32	170	32	40	35					

▲Stock available

△Make-to-order

Applicable inserts

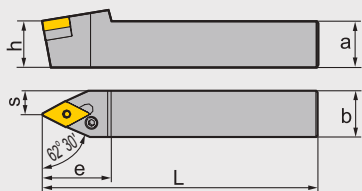
Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining	PCBN&PCD inserts
Inserts shape	DF A61	WGM Wiper A63	DR Double-side A65	HDR A66	Without chipbreaker A66	A121 -A122
	WGF Wiper A61	PM A63	DR Single-side A65			A122 -A123
	SF A62	DM A64	ER Double-side A65			A124
	EF A62	EM A64	ER Single-side A65			
	NF A62	NM A64	SNR Double-side A65			
	NGF A62		LR Single-side A65			
Tool holder type	PDJNR/L□□H/K/M11	DN□□1104□□	DN□□1104□□		DN□□1104□□	
	PDJNR/L□□K/M/P15	DN□□1506□□	DN□□1506□□	DN□□1506□□	DN□□1506□□	DN□□1506□□
	PDJNR/L□□K/M/P15-3	DN□□1504□□	DN□□1504□□		DN□□1504□□	DN□□1504□□

Corresponding tool holders of insert **DN** ☐ ☐ P-type clamping**PDPNN**

Kr:62°30'



R-type shown



Type		Stock	Basic dimensions(mm)						Screw	Shim	Wrench	Lever	Shim pin
			a	b	L	h	s	e					
PDPNN	2020K15	▲	20	20	125	20	8	38	LEM8×21	D15AP	WH30L	L4B	SP4
	2525M15	▲	25	25	150	25	12.5	38					
	3232P15	▲	32	32	170	32	16	38					
	2020K15-3	▲	20	20	125	20	8	38	LEM8×21	D15AP	WH30L	L4	SP4
	2525M15-3	▲	25	25	150	25	12.5	38					
	3232P15-3	▲	32	32	170	32	16	38					

▲Stock available

△Make-to-order

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining	PCBN&PCD inserts
Inserts shape	DF A61	WGM Wiper A63	DR Double-side A65	HDR A66	Without chipbreaker A66	A121 -A122
	WGF Wiper A61	PM A63	DR Single-side A65			A122 -A123
	SF A62	DM A64	ER Double-side A65			A124
	EF A62	EM A64	ER Single-side A65			
	NF A62	NM A64	SNR Double-side A65			
	NGF A62		LR Single-side A65			
Tool holder type	PDPNN□□K/M/P15	DN□□1506□□	DN□□1506□□	DN□□1506□□	DN□□1506□□	DN□□1506□□
	PDPNN□□K/M/P15-3	DN□□1504□□	DN□□1504□□		DN□□1504□□	DN□□1504□□

General turning

External turning tools



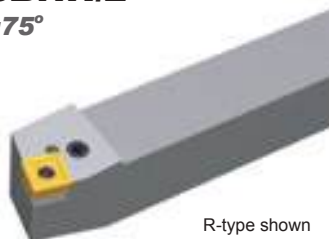
TURNING / General Turning Tools

External turning tools

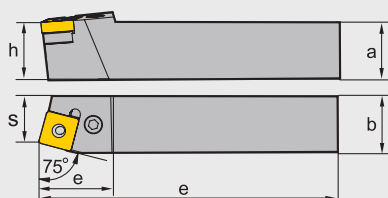
Corresponding tool holders of insert **SN** ☐ ☐ P-type clamping

PSBNR/L

Kr:75°



R-type shown



Type		Stock		Basic dimensions(mm)						Screw	Shim	Wrench	Lever	Shim pin
		R	L	a	b	L	h	s	e					
PSBNR/L	1616H09	▲	▲	16	16	100	16	13	21	LEM6×13.4A	S09AP	WH25L	L3	SP3
	2020K09	▲	▲	20	20	125	20	17	23					
	2020K12	▲	▲	20	20	125	20	17	28					
	2525M12	▲	▲	25	25	150	25	22	28	LEM8×21	S12AP	WH30L	L4	SP4
	3225P12	▲	△	32	25	170	32	22	28					
	3232P12	▲	▲	32	32	170	32	27	28					
	2525M15	▲	▲	25	25	150	25	22	35	LEM8×25	S15AP	WH30L	L5	SP5
	3232P15	▲	▲	32	32	170	32	27	35					
	3232P19	▲	▲	32	32	170	32	27	40	LEM10×27	S19AP	WH40L	L6	SP6
	4040R19	▲	▲	40	40	200	40	35	40					
	4040S2507	▲	▲	40	40	250	40	35	48	LEM12×36A	S25AP	WH50L	L8	SP8
	4040S2509	▲	▲	40	40	250	40	35	48		S25AP-09			

▲Stock available

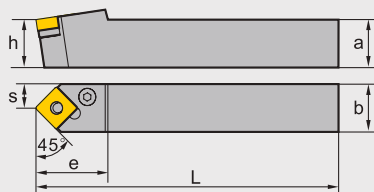
△Make-to-order

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining	PCBN&PCD inserts
Inserts shape	DF  A67	PM  A68	DR Double-side  A70	HDR  A72	Without chipbreaker  A74	 A126
	EF  A67	DM  A68	DR Single-side  A70 -71	HPR  A72		 A127
	SF  A67	EM  A69	ER Double-side  A71			 A128
		NM  A69	ER Single-side  A71			
			SNR Double-side  A71			
			LR Single-side  A69			
Tool holder type	PSBNR/L ☐ ☐ H/K09	SN ☐ ☐ ☐ 0903 ☐ ☐	SN ☐ ☐ ☐ 0903 ☐ ☐		SN ☐ ☐ ☐ 0903 ☐ ☐	
	PSBNR/L ☐ ☐ K/M/P12	SN ☐ ☐ ☐ 1204 ☐ ☐	SN ☐ ☐ ☐ 1204 ☐ ☐	SN ☐ ☐ ☐ 1204 ☐ ☐	SN ☐ ☐ ☐ 1204 ☐ ☐	SN ☐ ☐ ☐ 1204 ☐ ☐
	PSBNR/L ☐ ☐ M/P15	SN ☐ ☐ ☐ 1506 ☐ ☐	SN ☐ ☐ ☐ 1506 ☐ ☐	SN ☐ ☐ ☐ 1506 ☐ ☐	SN ☐ ☐ ☐ 1506 ☐ ☐	SN ☐ ☐ ☐ 1506 ☐ ☐
	PSBNR/L ☐ ☐ P/R19		SN ☐ ☐ ☐ 1906 ☐ ☐	SN ☐ ☐ ☐ 1906 ☐ ☐	SN ☐ ☐ ☐ 1906 ☐ ☐	SN ☐ ☐ ☐ 1906 ☐ ☐
	PSBNR/L ☐ ☐ S2507			SN ☐ ☐ ☐ 2507 ☐ ☐	SN ☐ ☐ ☐ 2507 ☐ ☐	
	PSBNR/L ☐ ☐ S2509			SN ☐ ☐ ☐ 2509 ☐ ☐	SN ☐ ☐ ☐ 2509 ☐ ☐	

Corresponding tool holders of insert **SN** ☐ ☐

P-type clamping

PSDNN**Kr:45°**

Type		Stock	Basic dimensions(mm)						Screw	Shim	Wrench	Lever	Shim pin
			a	b	L	h	s	e					
PSDNN	2020K12	▲	20	20	125	20	10	30	LEM8×21	S12AP	WH30L	L4	SP4
	2525M12	▲	25	25	150	25	12.5	30					
	3232P12	▲	32	32	170	32	16	40					
	2525M15	▲	25	25	150	25	12.5	40	LEM8×25	S15AP	WH30L	L5	SP5
	3232P15	▲	32	32	170	32	16	40					
	3232P19	▲	32	32	170	32	16	40	LEM10×27	S19AP	WH40L	L6	SP6
	4040R19	▲	40	40	200	40	20	40					

▲Stock available

△Make-to-order

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining Without chipbreaker	PCBN&PCD inserts
Inserts shape	DF  A67	PM  A68	DR Double-side  A70	HDR  A72	 A74	 A126
	EF  A67	DM  A68	DR Single-side  A70-71	HPR  A72		 A127
	SF  A67	EM  A69	ER Double-side  A71			 A128
		NM  A69	ER Single-side  A71			
			SNR Double-side  A71			
			LR Single-side  A69			
Tool holder type	PSDNN□□K/M/P12	SN□□1204□□	SN□□1204□□	SN□□1204□□	SN□□1204□□	SN□□1204□□
	PSDNN□□M/P15	SN□□1506□□	SN□□1506□□	SN□□1506□□	SN□□1506□□	
	PSDNN□□P/R19		SN□□1906□□	SN□□1906□□	SN□□1906□□	

General turning

External turning tools



TURNING / General Turning Tools

External turning tools

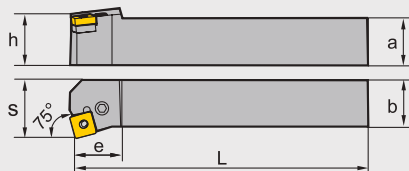
Corresponding tool holders of insert **SN** ☐ ☐ P-type clamping

PSKNR/L

Kr:75°



R-type shown



Type		Stock		Basic dimensions(mm)						Screw	Shim	Wrench	Lever	Shim pin
		R	L	a	b	L	h	s	e					
PSKNR/L	1616H09	▲	▲	16	16	100	16	20	17	LEM6×13.4A	S09AP	WH25L	L3	SP3
	2020K09	▲	△	20	20	125	20	25	20					
	2020K12	▲	▲	20	20	125	20	25	26					
	2525M12	▲	▲	25	25	150	25	32	26	LEM8×21	S12AP	WH30L	L4	SP4
	3232P12	▲	▲	32	32	170	32	40	26					
	2525M15	▲	▲	25	25	150	25	32	32					
	3232P15	▲	▲	32	32	170	32	40	32	LEM8×25	S15AP	WH30L	L5	SP5
	3232P19	▲	▲	32	32	170	32	40	36					
	4040R19	▲	▲	40	40	200	40	50	40	LEM10×27	S19AP	WH40L	L6	SP6

▲Stock available

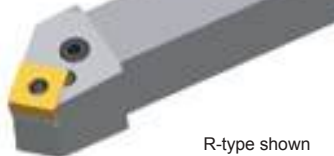
△Make-to-order

Applicable inserts

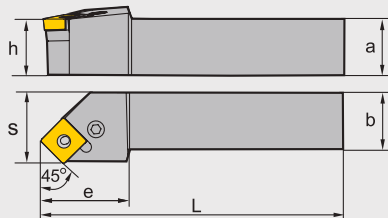
Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining	PCBN&PCD inserts
Inserts shape	DF  A67	PM  A68	DR Double-side  A70	HDR  A72	Without chipbreaker  A74	 A126
	EF  A67	DM  A68	DR Single-side  A70-71	HPR  A72		 A127
	SF  A67	EM  A69	ER Double-side  A71			 A128
		NM  A69	ER Single-side  A71			
			SNR Double-side  A71			
			LR Single-side  A69			
Tool holder type	PSKNR/L□□H/K09	SN□□0903□□	SN□□0903□□		SN□□0903□□	
	PSKNR/L□□K/M/P12	SN□□1204□□	SN□□1204□□	SN□□1204□□	SN□□1204□□	SN□□1204□□
	PSKNR/L□□M/P15	SN□□1506□□	SN□□1506□□	SN□□1506□□	SN□□1506□□	
	PSKNR/L□□P/R19		SN□□1906□□	SN□□1906□□	SN□□1906□□	

Corresponding tool holders of insert **SN** ☐ ☐

P-type clamping

PSSNR/L**Kr:45°**

R-type shown



Type		Stock		Basic dimensions(mm)						Screw	Shim	Wrench	Lever	Shim pin
		R	L	a	b	L	h	s	e					
PSSNR/L	1616H09	▲	▲	16	16	100	16	20	25	LEM6×13.4A	S09AP	WH25L	L3	SP3
	2020K09	△	△	20	20	125	20	25	25					
	2020K12	▲	▲	20	20	125	20	25	30					
	2525M12	▲	▲	25	25	150	25	32	30	LEM8×21	S12AP	WH30L	L4	SP4
	3232P12	▲	▲	32	32	170	32	40	40					
	2525M15	▲	▲	25	25	150	25	32	30					
	3232P15	▲	▲	32	32	170	32	40	40	LEM8×25	S15AP	WH30L	L5	SP5
	3232P19	▲	▲	32	32	170	32	40	40					
	4040R19	▲	▲	40	40	200	40	50	40					
	4040S2507	▲	▲	40	40	250	40	50	50	LEM12×36A	S25AP	WH50L	L8	SP8
	4040S2509	▲	▲	40	40	250	40	50	50		S25AP-09			

▲Stock available △Make-to-order

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining Without chipbreaker	PCBN&PCD inserts
Inserts shape	DF A67	PM A68	DR Double-side A70	HDR A72	A74	A126
	EF A67	DM A68	DR Single-side A70-71	HPR A72		A127
	SF A67	EM A69	ER Double-side A71			A128
		NM A69	ER Single-side A71			
			SNR Double-side A71			
			LR Single-side A69			
Tool holder type	PSSNR/L□□H/K09	SN□□0903□□	SN□□0903□□	SN□□0903□□	SN□□0903□□	
	PSSNR/L□□K/M/P12	SN□□1204□□	SN□□1204□□	SN□□1204□□	SN□□1204□□	SN□□1204□□
	PSSNR/L□□M/P15	SN□□1506□□	SN□□1506□□	SN□□1506□□	SN□□1506□□	
	PSSNR/L□□P/R19		SN□□1906□□	SN□□1906□□	SN□□1906□□	
	PSSNR/L□□S2507			SN□□2507□□	SN□□2507□□	
	PSSNR/L□□S2509			SN□□2509□□	SN□□2509□□	

General turning

External turning tools



TURNING / General Turning Tools

External turning tools

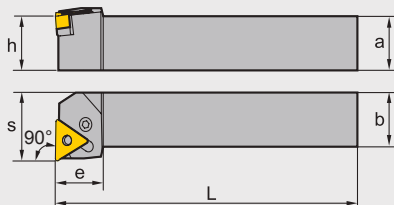
Corresponding tool holders of insert **TN** ☐ ☐ P-type clamping

PTFNR/L

Kr:90°



R-type shown



Type		Stock		Basic dimensions(mm)						Screw	Shim	Wrench	Lever	Shim pin
		R	L	a	b	L	h	s	e					
PTFNR/L	1616H16	△	▲	16	16	100	16	20	20	LEM6×13.4A	T16AP	WH25L	L3	SP3
	2020K16	▲	▲	20	20	125	20	25	20					
	2525M16	▲	▲	25	25	150	25	32	20					
	2525M22	▲	▲	25	25	150	25	32	25	LEM8×21	T22AP	WH30L	L4	SP4
	3232P22	▲	▲	32	32	170	32	40	25					
	3232P27	▲	▲	32	32	170	32	40	34	LEM8×25	T27AP	WH30L	L5	SP5
	4040S27	▲	▲	40	40	250	40	50	34					

▲Stock available

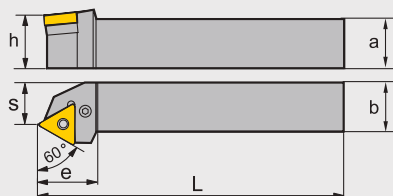
△Make-to-order

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining	PCBN&PCD inserts
Inserts shape	DF A75	WGM Wiper A76	DR Double-side A78	HDR A79	Without chipbreaker A80	A130
	WGF Wiper A75	PM A76	DR Single-side A78			A130 -A131
	SF A75	DM A77	ER Double-side A78			A131
	EF A76	EM A77	SNR A78			
			LR Single-side A77			
Tool holder type	PTFNR/L□□H/K/M16	TN□□1604□□	TN□□1604□□	TN□□1604□□	TN□□1604□□	TN□□1604□□
	PTFNR/L□□M/P22	TN□□2204□□	TN□□2204□□	TN□□2204□□	TN□□2204□□	TN□□2204□□
	PTFNR/L□□P/S27		TN□□2706□□	TN□□2706□□	TN□□2706□□	

Corresponding tool holders of insert **TN** ☐ ☐ P-type clamping**PTTNR/L****Kr:60°**

R-type shown



Type		Stock		Basic dimensions(mm)						Screw	Shim	Wrench	Lever	Shim pin
		R	L	a	b	L	h	s	e					
PTTNR/L	1616H16	▲	▲	16	16	100	16	13	25	LEM6×13.4A	T16AP	WH25L	L3	SP3
	2020K16	▲	▲	20	20	125	20	17	25					
	2525M16	△	△	25	25	150	25	22	25	LEM8×21	T22AP	WH30L	L4	SP4
	2525M22	▲	▲	25	25	150	20	22	32					

▲Stock available

△Make-to-order

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining	PCBN&PCD inserts	
Inserts shape	DF  A75	WGM Wiper  A76	DR Double-side  A78	HDR  A79	Without chipbreaker  A80	 A130	
	WGF Wiper  A75	PM  A76	DR Single-side  A78			 A130 -A131	
	SF  A75	DM  A77	ER Double-side  A78			 A131	
	EF  A76	EM  A77	SNR  A78				
			LR Single-side  A77				
Tool holder type	PTTNR/L□□H/K/M16	TN□□1604□□	TN□□1604□□	TN□□1604□□	TN□□1604□□	TN□□1604□□	TN□□1604□□
	PTTNR/L□□M22	TN□□2204□□	TN□□2204□□	TN□□2204□□	TN□□2204□□		

General turning

External turning tools



TURNING / General Turning Tools

External turning tools

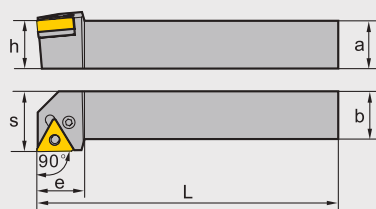
Corresponding tool holders of insert **TN** ☐ ☐ P-type clamping

PTG NR/L

Kr:90°



R-type shown



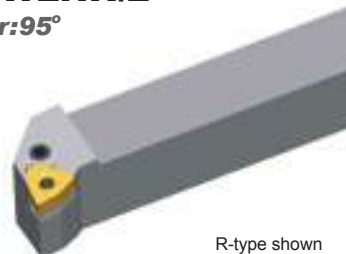
Type		Stock		Basic dimensions(mm)						Screw	Shim	Wrench	Lever	Shim pin
		R	L	a	b	L	h	s	e					
PTG NR/L	1616H16	▲	▲	16	16	100	16	20	20	LEM6×13.4A	T16AP	WH25L	L3	SP3
	2020K16	▲	▲	20	20	125	20	25	20					
	2525M16	▲	▲	25	25	150	25	32	20					
	3232P16	▲	▲	32	32	170	32	40	20					
	2525M22	▲	▲	25	25	150	25	32	28	LEM8×21	T22AP	WH30L	L4	SP4
	3232P22	▲	▲	32	32	170	32	40	28					
	3232P27	▲	▲	32	32	170	32	40	33	LEM8×25	T27AP	WH30L	L5	SP5
	4040S27	▲	▲	40	40	250	40	50	33					

▲Stock available

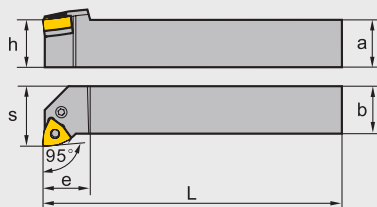
△Make-to-order

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining	PCBN&PCD inserts
Inserts shape	DF Wiper A75	WGM Wiper A76	DR Double-side A78	HDR A79	Without chipbreaker A80	A130
	WGF Wiper A75	PM A76	DR Single-side A78			A130 -A131
	SF A75	DM A77	ER Double-side A78			A131
	EF A76	EM A77	SNR A78			
			LR Single-side A77			
Tool holder type	PTG NR/L□□H/K/M/P16	TN□□1604□□	TN□□1604□□	TN□□1604□□	TN□□1604□□	TN□□1604□□
	PTG NR/L□□M/P22	TN□□2204□□	TN□□2204□□	TN□□2204□□	TN□□2204□□	
	PTG NR/L□□P/S27		TN□□2706□□	TN□□2706□□		

Corresponding tool holders of insert **WN** ☐ ☐ P-type clamping**PWLNRL****Kr:95°**

R-type shown



Type		Stock		Basic dimensions(mm)						Screw	Shim	Wrench	Lever	Shim pin
		R	L	a	b	L	h	s	e					
PWLNRL	1616H06	▲	▲	16	16	100	16	20	20	LEM6×13.4A	W06AP	WH25L	L3	SP3
	2020K06	▲	▲	20	20	125	20	25	20					
	2525M06	▲	▲	25	25	150	25	32	20					
	2020K08	▲	▲	20	20	125	20	25	26	LEM8×21	W08AP	WH30L	L4	SP4
	2525M08	▲	▲	25	25	150	25	32	26					
	3232P08	△	△	32	32	170	32	40	28					

▲Stock available

△Make-to-order

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For cast iron machining	PCBN&PCD inserts
Inserts shape	DF Wiper A83	WGM Wiper A84	DR Double-side A86	Without chipbreaker A86	A136
	WGF Wiper A83	PM A85	SNR Double-side A86		A136 -A137
	SF A83	DM A85			A137
	EF A84	EM A85			
	NF A84	NM A86			
Tool holder type	PWLNRL/□□H/K/M06	WN□□0604□□	WN□□0604□□	WN□□0604□□	WN□□0604□□
	PWLNRL/□□K/M/P08	WN□□0804□□	WN□□0804□□	WN□□0804□□	WN□□0804□□

General turning

External turning tools



TURNING General Turning Tools

External turning tools

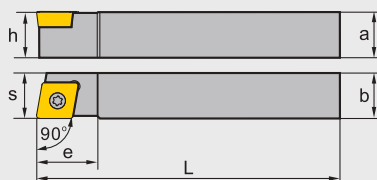
Corresponding tool holders of insert **CC** ☐ ☐ S-type clamping

SCACR/L

Kr:90°



R-type shown



Type		Stock		Basic dimensions(mm)						Screw	Wrench
		R	L	a	b	L	h	s	e		
SCACR/L	0808F06	△	△	8	8	80	8	8	16	I60M2.5×6.5	WT07IP
	1010H06	▲	△	10	10	100	10	10	16		
	1212H06	△	△	12	12	100	12	12	16		
	1212H09	▲	▲	12	12	100	12	12	20	I60M3.5×8	WT15IP
	1616H09	△	△	16	16	100	16	16	20		

▲ Stock available

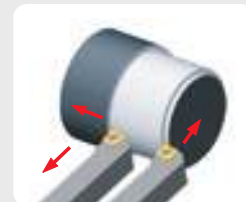
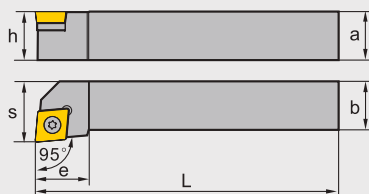
△ Make-to-order

Applicable inserts

Application		For extra finishing	For finishing	For semi-finishing	For roughing	For Al machining	For cast iron machining	PCBN&PCD inserts
Inserts shape	USF  A89	HF  A89	HM  A90	HR  A91	LH  A91-92	Without chipbreaker  A92	 A139	
	SF  A89	EF  A90	EM  A90		LC  A91		 A144	
Tool holder type	SCACR/L□□H/F06	CC□□0602□□	CC□□0602□□	CC□□0602□□	CC□□0602□□	CCGX 0602□□	CC□□ 0602□□	CC□□ 0602□□
	SCACR/L□□H09	CC□□09T3□□	CC□□09T3□□	CC□□09T3□□	CC□□09T3□□	CCGX 09T3□□	CC□□ 09T3□□	CC□□ 09T3□□

Corresponding tool holders of insert **CC** ☐ ☐ S-type clamping**SCLCR/L****Kr:95°**

R-type shown



Type		Stock		Basic dimensions(mm)						Screw	Shim	Shim screw	Wrench
		R	L	a	b	L	h	s	e				
SCLCR/L	0808F06	▲	△	08	08	80	08	10	12	I60M2.5×6.5	---	---	WT07IP
	1010F06	▲	▲	10	10	80	10	12	12				
	1212H06	△	△	12	12	100	12	16	12				
	1616H06	△	△	16	16	100	16	20	16				
	1212H09	▲	▲	12	12	100	12	16	16	I60M3.5×8	---	---	WT15IP
	1616H09	▲	▲	16	16	100	16	20	16				
	2020K09	△	△	20	20	125	20	25	16				
	2525M09	△	△	25	25	150	25	32	16				
	2020K12	▲	▲	20	20	125	20	25	20	I60M4×11X	C12BS	SM6×10XA	WT15IP WH40L
	2525M12	▲	▲	25	25	150	25	32	20				
	3225M12	▲	▲	32	25	150	32	32	20				

▲ Stock available

△ Make-to-order

Applicable inserts

Application	For extra finishing	For finishing	For semi-finishing	For roughing	For Al machining	For cast iron machining	PCBN&PCD inserts	
Inserts shape	USF  A89	HF  A89	HM  A90	HR  A91	LH  A91-92	Without chipbreaker  A92	 A139	
	SF  A89	EF  A90	EM  A90		LC  A91		 A144	
Tool holder type	SCLCR/L□□H/F06	CC□□ 0602□□	CC□□ 0602□□	CC□□ 0602□□	CC□□ 0602□□	CCGX 0602□□	CC□□ 0602□□	CC□□ 0602□□
	SCLCR/L□□H/K/M09	CC□□ 09T3□□	CC□□ 09T3□□	CC□□ 09T3□□	CC□□ 09T3□□	CCGX 09T3□□	CC□□ 09T3□□	CC□□ 09T3□□
	SCLCR/L□□K/M12		CC□□ 1204□□	CC□□ 1204□□	CC□□ 1204□□	CCGX 1204□□	CC□□ 1204□□	CC□□ 1204□□

General turning

External turning tools



TURNING General Turning Tools

External turning tools

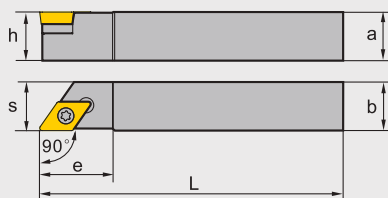
Corresponding tool holders of insert **DC** ☐ ☐ S-type clamping

SDACR/L

Kr:90°



R-type shown



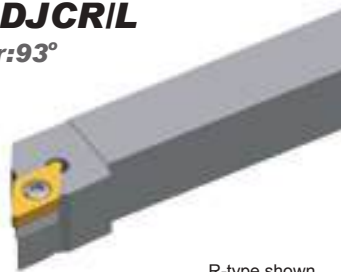
Type		Stock		Basic dimensions(mm)						Screw	Shim	Shim screw	Wrench
		R	L	a	b	L	h	s	e				
SDACR/L	0808K07	△	△	8	8	125	8	8	15	I60M2.5×6.5	---	---	WT07IP
	1010K07	△	△	10	10	125	10	10	15				
	1212K07	△	△	12	12	125	10	10	15				
	1212K11	△	△	12	12	125	12	12	22	I60M3.5×8	---	---	WT15IP
	1616K11	△	△	16	16	125	16	16	22	I60M3.5×12	D11BS	SM5×8.65XA	WT15IP WH35L
	2020K11	△	△	20	20	125	20	20	22				
	2525M11	△	△	25	25	150	25	25	22				

▲Stock available

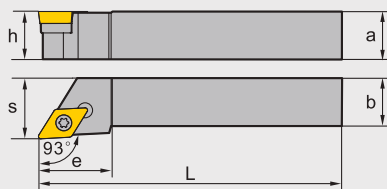
△Make-to-order

Applicable inserts

Application	For extra finishing	For finishing	For semi-finishing	For roughing	For Al machining	For cast iron machining	PCBN&PCD inserts
Inserts shape	USF  A93	HF  A93	HM  A94	HR  A95	LH  A95	 A95 Without chipbreaker	 A140
	SF  A93	EF  A94	EM  A94		LC  A95		 A145
Tool holder type	SDACR/L□□K07	DC□□ 0702□□	DC□□ 0702□□	DC□□ 0702□□	DCGX 0702□□	DC□□ 0702□□	DC□□ 0702□□
	SDACR/L□□K/M11	DC□□ 11T3□□	DC□□ 11T3□□	DC□□ 11T3□□	DCGX 11T3□□	DC□□ 11T3□□	DC□□ 11T3□□

Corresponding tool holders of insert **DC** ☐ ☐ S-type clamping**SDJCR/L****Kr:93°**

R-type shown



Type		Stock		Basic dimensions(mm)						Screw	Shim	Shim screw	Wrench
		R	L	a	b	L	h	s	e				
SDJCR/L	0808F07	△	△	8	8	80	8	10	15	I60M2.5×6.5	---	---	WT07IP
	1010F07	▲	△	10	10	80	10	12	15				
	1212H07	▲	▲	12	12	100	12	16	15				
	1414H07	△	△	14	14	100	14	18	15				
	1616H07	▲	▲	16	16	100	16	20	15				
	2020K07	△	△	20	20	125	20	25	28				
	2525M07	△	△	25	25	150	25	32	28				
	1212K11	△	△	12	12	125	12	16	22	I60M3.5×12	D11BS	SM5×8.65XA	WT15IP WH35L
	1616K11	▲	▲	16	16	125	16	20	22				
	2020K11	▲	▲	20	20	125	20	25	22				
	2525M11	▲	▲	25	25	150	25	32	22				

▲ Stock available

△ Make-to-order

Applicable inserts

Application	For extra finishing	For finishing	For semi-finishing	For roughing	For Al machining	For cast iron machining	PCBN&PCD inserts
Inserts shape	USF A93	HF A93	HM A94	HR A95	LH A95	Without chipbreaker A95	 A140
	SF A93	EF A94	EM A94		LC A95		 A145
Tool holder type	SDJCR/L□□F/H/K/M07	DC□□0702□□	DC□□0702□□	DC□□0702□□	DCGX 0702□□	DC□□0702□□	DC□□0702□□
	SDJCR/L□□K/M11	DC□□11T3□□	DC□□11T3□□	DC□□11T3□□	DCGX 11T3□□	DC□□11T3□□	DC□□11T3□□

General turning

External turning tools



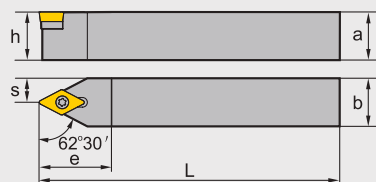
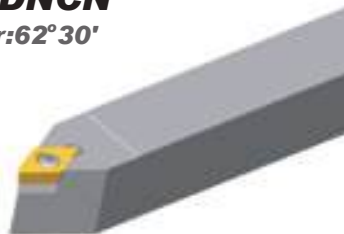
TURNING / General Turning Tools

External turning tools

Corresponding tool holders of insert **DC** ☐ ☐ S-type clamping

SDNCN

Kr:62°30'



Type	Stock	Basic dimensions(mm)							Screw	Shim	Shim screw	Wrench
		a	b	L	h	s	e					
SDNCN	0808F07	△	8	8	80	8	4	15	I60M2.5×6.5	---	---	WT07IP
	1010F07	▲	10	10	80	10	5	15				
	1212H07	▲	12	12	100	12	6	15				
	1616H07	△	16	16	100	16	8	15				
	2020K07	△	20	20	125	20	10	20				
	2525M07	△	25	25	150	25	12.5	20				
	1616K11	▲	16	16	125	16	8	22	I60M3.5×12	D11BS	SM5×8.65XA	WT15IP WH35L
	2020K11	▲	20	20	125	20	10	22				
	2525M11	▲	25	25	150	25	12.5	22				
	3225M11	△	32	25	150	32	12.5	22				
	3232P11	△	32	32	170	32	16	22				

▲ Stock available

△ Make-to-order

Applicable inserts

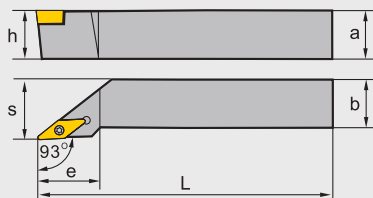
Application	For extra finishing	For finishing	For semi-finishing	For roughing	For Al machining	For cast iron machining	PCBN&PCD inserts
Inserts shape	USF  A93	HF  A93	HM  A94	HR  A95	LH  A95	Without chipbreaker  A95	 A140
	SF  A93	EF  A94	EM  A94		LC  A95		 A145
Tool holder type	SDNCN□□F/H/K/M07	DC□□0702□□	DC□□0702□□	DC□□0702□□	DCGX 0702□□	DC□□0702□□	DC□□0702□□
	SDNCN□□K/M/P11	DC□□11T3□□	DC□□11T3□□	DC□□11T3□□	DCGX 11T3□□	DC□□11T3□□	DC□□11T3□□

Corresponding tool holders of insert **VB** ☐ ☐

S-type clamping

SVJBR/L**Kr:93°**

R-type shown



Type		Stock		Basic dimensions(mm)						Screw	Shim	Shim screw	Wrench
		R	L	a	b	L	h	s	e				
SVJBR/L	1212H11	▲	▲	12	12	100	12	16	25	I60M2.5×6.5	---	---	WT071P
	1616H11	▲	▲	16	16	100	16	20	25				
	2020K11	▲	▲	20	20	125	20	25	25				
	2525M11	▲	▲	25	25	150	25	32	25				
	1616H16	▲	▲	16	16	100	16	20	35	I60M3.5×12	V16BS	SM5×8.65XA	WT151P WH35L
	2020K16	▲	▲	20	20	125	20	25	35				
	2525M16	▲	▲	25	25	150	25	32	35				

▲Stock available

△Make-to-order

Applicable inserts

Application	For extra finishing	For finishing	For semi-finishing	For roughing	PCBN&PCD inserts
Inserts shape	SF  A108	HF  A108	HM  A109	HR  A109	 A142
		NF  A108	EM  A109	SNR  A109	 A147
		EF  A108			
		NGF  A108			
Tool holder type	SVJBR/L□□H/K/M11	VB□□1103□□	VB□□1103□□	VB□□1103□□	
	SVJBR/L□□H/K/M16		VB□□1604□□	VB□□1604□□	VB□□1604□□

General turning

External turning tools



TURNING / General Turning Tools

External turning tools

Corresponding tool holders of insert **VB** ☐ ☐

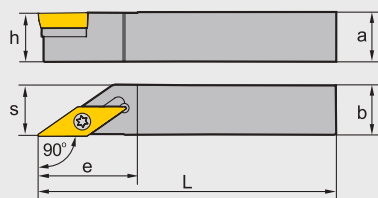
S-type clamping

SVABR/L

Kr:90°



R-type shown



Type		Stock		Basic dimensions(mm)						Screw	Shim	Shim screw	Wrench
		R	L	a	b	L	h	s	e				
SVABR/L	1010F11	△	△	10	10	80	10	10	25	I60M2.5×6.5	---	---	WT07IP
	1616H16	△	△	16	16	100	16	16	28				
	2020K16	△	△	20	20	125	20	20	28	I60M3.5×12	V16BS	SM5×8.65XA	WT15IP WH35L
	2525M16	△	△	25	25	150	25	25	28				

▲Stock available

△Make-to-order

Applicable inserts

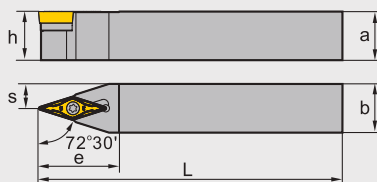
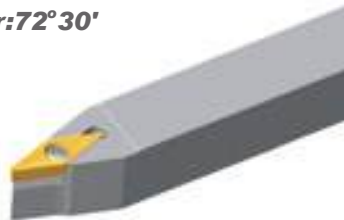
Application	For extra finishing	For finishing	For semi-finishing	For roughing	PCBN&PCD inserts
Inserts shape	SF  A108	HF  A108	HM  A109	HR  A109	 A142
		NF  A108	EM  A109	SNR  A109	 A147
		EF  A108			
		NGF  A108			
Tool holder type	SVABR/L□□F11	VB□□1103□□	VB□□1103□□	VB□□1103□□	
	SVABR/L□□H/K/M16		VB□□1604□□	VB□□1604□□	VB□□1604□□

Corresponding tool holders of insert **VB** ☐ ☐

S-type clamping

SVVBN

Kr:72°30'



Type		Stock	Basic dimensions(mm)						Screw	Shim	Shim screw	Wrench
			a	b	L	h	s	e				
SVVBN	1212H11	▲	12	12	100	12	6	25	I60M2.5×6.5	---	---	WT07IP
	1616H11	▲	16	16	100	16	8	25				
	2020K11	▲	20	20	125	20	10	25				
	2525M11	△	25	25	150	25	12.5	35				
	1616H16	▲	16	16	100	16	8	35	I60M3.5×12	V16BS	SM5×8.65XA	WT15IP WH35L
	2020K16	▲	20	20	125	20	10	35				
	2525M16	▲	25	25	150	25	12.5	35				

▲Stock available

△Make-to-order

Applicable inserts

Application	For extra finishing	For finishing	For semi-finishing	For roughing	PCBN&PCD inserts
Inserts shape	SF  A108	HF  A108	HM  A109	HR  A109	 A142
		NF  A108	EM  A109	SNR  A109	 A147
		EF  A108			
		NGF  A108			
Tool holder type	SVVBN□□H/K/M11	VB□□1103□□	VB□□1103□□	VB□□1103□□	
	SVVBN□□H/K/M16		VB□□1604□□	VB□□1604□□	VB□□1604□□

General turning

External turning tools



TURNING / General Turning Tools

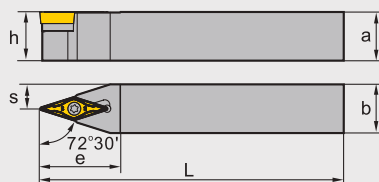
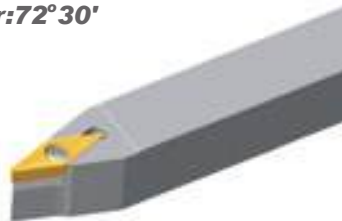
External turning tools

Corresponding tool holders of insert VC□□

S-type clamping

SVVCN

Kr:72°30'



Type		Stock	Basic dimensions(mm)						Screw	Shim	Shim screw	Wrench
			a	b	L	h	s	e				
SVVCN	1212H11	▲	12	12	100	12	6	25	I60M2.5×6.5	---	---	WT07IP
	1616H11	▲	16	16	100	16	8	27				
	2020K11	▲	20	20	125	20	10	30				
	2525M11	△	25	25	150	25	12.5	38				
	1616H16	▲	16	16	100	16	8	33	I60M3.5×12	V16BSC	SM5×8.65XA	WT15IP WH35L
	2020K16	▲	20	20	125	20	10	33				
	2525M16	▲	25	25	150	25	12.5	38				

▲Stock available

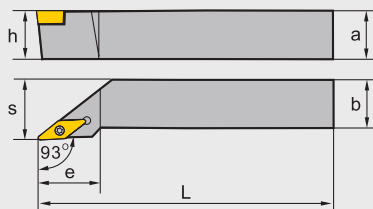
△Make-to-order

Applicable inserts

Application	For extra finishing	For finishing	For AI machining	PCBN&PCD inserts
Inserts shape	USF  A105	HF  A105	LH  A106	 A143
	SF  A105	NF  A105	LC  A106	 A148
		NGF  A105		
Tool holder type	SVVCN□□H/K/M11	VC□□1103□□	VC□□1103□□	VCGX1103□□
	SVVCN□□H/K/M16		VC□□1604□□	VCGX1604□□ VC□□1604□□

Corresponding tool holders of insert VC ☐ ☐ S-type clamping**SVJCR/L****Kr:93°**

R-type shown



Type		Stock		Basic dimensions(mm)						Screw	Shim	Shim screw	Wrench
		R	L	a	b	L	h	s	e				
SVJCR/L	1212H11	△	△	12	12	100	12	16	25	I60M2.5×6.5	---	---	WT07IP
	1616H11	▲	▲	16	16	100	16	20	25				
	2020K11	▲	▲	20	20	125	20	25	25				
	2525M11	▲	▲	25	25	150	25	32	35				
	1616H16	▲	▲	16	16	100	16	20	35	I60M3.5×12	V16BSC	SM5×8.65XA	WT15IP WH35L
	2020K16	▲	▲	20	20	125	20	25	35				
	2525M16	▲	▲	25	25	150	25	32	35				

▲Stock available

△Make-to-order

Applicable inserts

Application	For extra finishing	For finishing	For Al machining	PCBN&PCD inserts
Inserts shape	USF  A105	HF  A105	LH  A106	 A143
	SF  A105	NF  A105	LC  A106	 A148
		NGF  A105		
Tool holder type	SVJCR/L□□H/K/M11	VC□□1103□□	VC□□1103□□	VCGX1103□□
	SVJCR/L□□H/K/M16		VC□□1604□□	VCGX1604□□
				VC□□1604□□

General turning

External turning tools



TURNING General Turning Tools

External turning tools

Corresponding tool holders of insert **SC** ☐ ☐

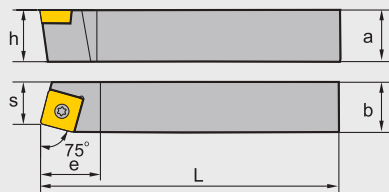
S-type clamping

SSBCR/L

Kr:75°



R-type shown



Type		Stock		Basic dimensions(mm)						Screw	Shim	Shim screw	Wrench
		R	L	a	b	L	h	s	e				
SSBCR/L	1212H09	▲	▲	12	12	100	12	9	16	I60M3.5×8	---	---	WT15IP
	1616H09	▲	▲	16	16	100	16	13	16				
	2020K09	△	△	20	20	125	20	17	20	I60M3.5×12	S09BS	SM5×8.65XA	WT15IP WH35L
	2525M09	△	△	25	25	150	25	22	20				
	2020K12	▲	▲	20	20	125	20	17	25	I60M4×11X	S12BS	SM6×10XA	WT15IP WH40L
	2525M12	△	△	25	25	150	25	22	25				

▲Stock available

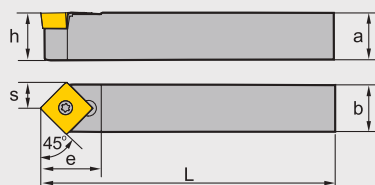
△Make-to-order

Applicable inserts

Application	For finishing		For semi-finishing	For roughing	For Al machining	For cast iron machining
Inserts shape	HF  A98	HM  A98	HR  A99	LH  A99	Without chipbreaker  A99	
	EF  A98	EM  A98		LC  A99		
Tool holder type	SSBCR/L□□H/K/M09		SC□□09T3□□	SC□□09T3□□	SC□□09T3□□	SC□□09T3□□
	SSBCR/L□□K/M12		SC□□1204□□	SC□□1204□□	SC□□1204□□	SC□□1204□□

Corresponding tool holders of insert **SC** ☐ ☐

S-type clamping

SSDCN
Kr:45°

Type	Stock	Basic dimensions(mm)							Screw	Shim	Shim screw	Wrench
		a	b	L	h	s	e					
SSDCN	1212H09	▲	12	12	100	12	6	16	I60M3.5×8	---	---	WT15IP
	1616H09	▲	16	16	100	16	8	16				
	2020K09	△	20	20	125	20	10	20	I60M3.5×12	S09BS	SM5×8.65XA	WT15IP WH35L
	2525M09	△	25	25	150	25	12.5	20				
	2525M12	▲	25	25	150	25	12.5	22	I60M4×11	S12BS	SM6×10XA	WT15IP WH40L

▲Stock available

△Make-to-order

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For Al machining	For cast iron machining
Inserts shape	HF  A98	HM  A98	HR  A99	LH  A99	Without chipbreaker  A99
	EF  A98	EM  A98		LC  A99	
Tool holder type	SSDCN□□H/K/M09	SC□□09T3□□	SC□□09T3□□	SCGX09T3□□	SC□□09T3□□
	SSDCN□□M12		SC□□1204□□	SCGX1204□□	SC□□1204□□

General turning

External turning tools



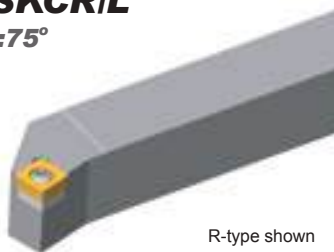
TURNING / General Turning Tools

External turning tools

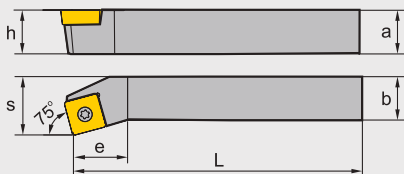
Corresponding tool holders of insert **SC** ☐ ☐ S-type clamping

SSKCR/L

Kr:75°



R-type shown



Type		Stock		Basic dimensions(mm)						Screw	Shim	Shim screw	Wrench
		R	L	a	b	L	h	s	e				
SSKCR/L	1212H09	△	△	12	12	100	12	16	16	I60M3.5×8	---	---	WT15IP
	1616H09	▲	△	16	16	100	16	20	16	I60M3.5×12	S09BS	SM5×8.65XA	WT15IP WH35L
	2020K09	△	△	20	20	125	20	25	20				
	2525M09	△	△	25	25	150	25	32	20				
	2020K12	△	△	20	20	125	20	25	22	I60M4×11X	S12BS	SM6×10XA	WT15IP WH40L
	2525M12	△	△	25	25	150	25	32	22				

▲ Stock available

△ Make-to-order

Applicable inserts

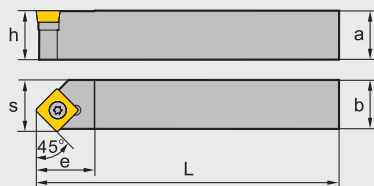
Application	For finishing	For semi-finishing	For roughing	For Al machining	For cast iron machining
Inserts shape	HF  A98	HM  A98	HR  A99	LH  A99	Without chipbreaker  A99
	EF  A98	EM  A98		LC  A99	
Tool holder type	SSKCR/L□□H/K/M09	SC□□09T3□□	SC□□09T3□□	SC□□09T3□□	SCGX09T3□□
	SSKCR/L□□K/M12		SC□□1204□□	SC□□1204□□	SCGX1204□□

Corresponding tool holders of insert **SC** ☐ ☐

S-type clamping

SSSCR/L*Kr:45°*

R-type shown



Type		Stock		Basic dimensions(mm)						Screw	Shim	Shim screw	Wrench
		R	L	a	b	L	h	s	e				
SSSCR/L	1212H09	△	△	12	12	100	12	16	16	I60M3.5×8	---	---	WT15IP
	1616H09	▲	▲	16	16	100	16	17	16	I60M3.5×12	S09BS	SM5×8.65XA	WT15IP WH35L
	2020K09	△	△	20	20	125	20	21	20				
	2525M09	△	△	25	25	150	25	32	20	I60M4×11X	S12BS	SM6×10XA	WT15IP WH40L
	2020K12	▲	▲	20	20	125	20	21	24				
	2525M12	△	△	25	25	150	25	32	22				

▲ Stock available

△ Make-to-order

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For AI machining	For cast iron machining
Inserts shape	HF  A98	HM  A98	HR  A99	LH  A99	Without chipbreaker  A99
	EF  A98	EM  A98		LC  A99	
Tool holder type	SSSCR/L□□H/K/M09	SC□□09T3□□	SC□□09T3□□	SCGX09T3□□	SC□□09T3□□
	SSSCR/L□□K/M12		SC□□1204□□	SCGX1204□□	SC□□1204□□

General turning

External turning tools



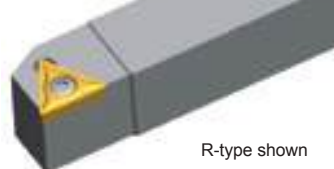
General Turning Tools

External turning tools

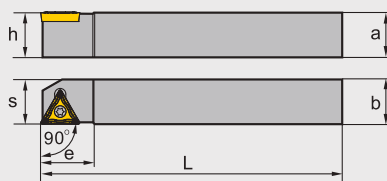
Corresponding tool holders of insert **TC** ☐ ☐ S-type clamping

STACR/L

Kr:90°



R-type shown

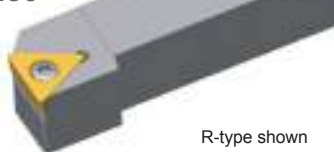


Type		Stock		Basic dimensions(mm)						Screw	Wrench	---	---
		R	L	a	b	L	h	s	e			---	---
STACR/L	1010K11	△	△	10	10	100	10	10	12	I60M2.5×6.5	WT07IP	---	---
	1212F11	△	△	12	12	100	12	12	14			---	---
	1616K11	△	△	16	16	100	16	16	16			---	---

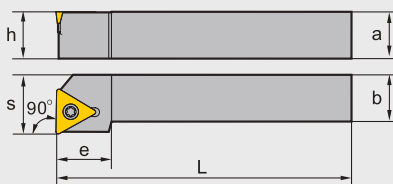
▲Stock available △Make-to-order

STFCR/L

Kr:90°



R-type shown



Type		Stock		Basic dimensions(mm)						Screw	Shim	Shim screw	Wrench
		R	L	a	b	L	h	s	e				
STFCR/L	1212H11	▲	▲	12	12	100	12	16	14	I60M2.5×6.5	---	---	WT07IP
	1616H11	▲	▲	16	16	100	16	20	14				
	2020K11	△	△	20	20	125	20	25	20				
	2525M11	△	△	25	25	150	25	32	20				
	1616K16	▲	▲	16	16	125	16	20	20	I60M3.5×12	T16BS	SM5×8.65XA	WT15IP WH35L
	2020K16	▲	▲	20	20	125	20	25	20				
	2525M16	△	△	25	25	150	25	32	25				

▲Stock available △Make-to-order

Applicable inserts

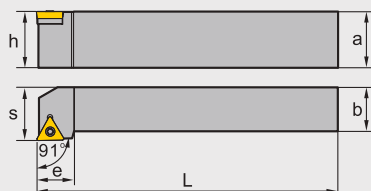
Application	For finishing	For semi-finishing	For roughing	For Al machining	For cast iron machining	PCBN&PCD inserts
Inserts shape	HF  A101	HM  A103	HR  A103	LH  A104	Without chipbreaker  A104	 A141
	EF  A102	EM  A102		LC  A103		
Tool holder type	STACR/L□□K/F11	TC□□1102□□	TC□□1102□□	TC□□1102□□	TCGX1102□□	TC□□1102□□
	STFCR/L□□H/K/M11	TC□□1102□□	TC□□1102□□	TC□□1102□□	TCGX1102□□	TC□□1102□□
	STFCR/L□□K/M16	TC□□16T3□□	TC□□16T3□□	TC□□16T3□□	TCGX16T3□□	TC□□16T3□□

Corresponding tool holders of insert **TC** ☐ ☐

S-type clamping

STGCR/L**Kr:91°**

R-type shown

General
turning

External turning tools

Type		Stock		Basic dimensions(mm)						Screw	Shim	Shim screw	Wrench
		R	L	a	b	L	h	s	e				
STGCR/L	0808F09	▲	△	08	08	80	8	10	12	I60M2.2×5.5	---	---	WT06IP
	1010F09	▲	▲	10	10	80	10	12	12				
	1212H09	△	△	12	12	100	12	16	12				
	1212H11	▲	▲	12	12	100	12	16	16	I60M2.5×6.5	---	---	WT07IP
	1616H11	▲	▲	16	16	100	16	20	16				
	2020K11	△	△	20	20	125	20	25	20				
	2525M11	△	△	25	25	150	25	32	20	I60M3.5×12	T16BS	SM5×8.65XA	WT15IP WH35L
	1616K16	△	△	16	16	125	16	20	20				
	2020K16	▲	▲	20	20	125	20	25	21				
	2525M16	▲	▲	25	25	150	25	32	21				

▲Stock available

△Make-to-order

Applicable inserts

Application	For extra finishing	For finishing	For semi-finishing	For roughing	For Al machining	For cast iron machining	PCBN&PCD inserts	
Inserts shape	USF  A100	HF  A101	HM  A103	HR  A103	LH  A104	Without chipbreaker  A104	 A141	
	SF  A100	EF  A102	EM  A102		LC  A103			
Tool holder type	STGCR/L□□F/H09	TC□□0902□□	TC□□0902□□	TC□□0902□□	TC□□0902□□	TCGX0902□□	TC□□0902□□	TC□□0902□□
	STGCR/L□□H/K/M11		TC□□1102□□	TC□□1102□□	TC□□1102□□	TCGX1102□□	TC□□1102□□	TC□□1102□□
	STGCR/L□□K/M16		TC□□16T3□□	TC□□16T3□□	TC□□16T3□□	TCGX16T3□□	TC□□16T3□□	



TURNING General Turning Tools

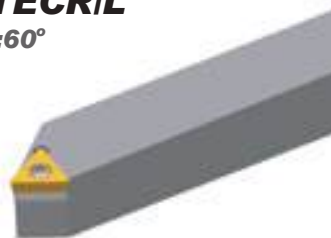
External turning tools

Corresponding tool holders of insert **TC** ☐ ☐

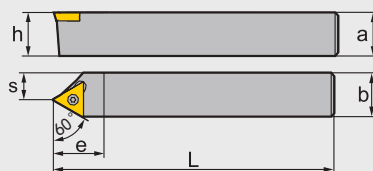
S-type clamping

STECR/L

Kr:60°



R-type shown



Type		Stock		Basic dimensions(mm)						Screw	Shim	Shim screw	Wrench
		R	L	a	b	L	h	s	e				
STECR/L	1616H11	△	△	16	16	100	16	10.5	16	I60M2.5×6.5	---	---	WT07IP
	2020K11	△	△	20	20	125	20	14.5	20				
	2020K16	△	△	20	20	125	20	12.5	20	I60M3.5×12	T16BS	SM5×8.65XA	WT15IP
	2525M16	△	△	25	25	150	25	17.0	25				

▲Stock available

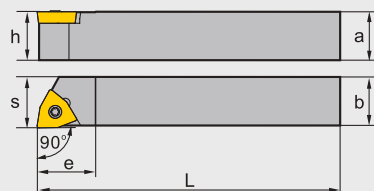
△Make-to-order

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For Al machining	For cast iron machining	PCBN&PCD inserts	
Inserts shape	HF  A101	HM  A103	HR  A103	LH  A104	Without chipbreaker  A104	 A14	
	EF  A102	EM  A102		LC  A103			
Tool holder type	STECR/L□□H/K11	TC□□1102□□	TC□□1102□□	TC□□1102□□	TCGX1102□□	TC□□1102□□	TC□□1102□□
	STECR/L□□K/M16	TC□□16T3□□	TC□□16T3□□	TC□□16T3□□	TCGX16T3□□	TC□□16T3□□	

Corresponding tool holders of insert **WC** ☐ ☐ S-type clamping
SWACR/L
Kr:90°


R-type shown



Type		Stock		Basic dimensions(mm)						Screw	Wrench	—	—
		R	L	a	b	L	h	s	e			—	—
SWACR/L	1010E04	△	△	10	10	70	10	10	10	I60M2.5×6.5	WT07IP	---	---
	1212F04	▲	△	12	12	80	12	12	14			---	---
	1616H06	▲	△	16	16	100	16	16	20	I60M3×7	WT10IP	---	---
	2020K08	▲	▲	20	20	125	20	20	24	I60M3.5×12	WT15IP	---	---

▲Stock available

△Make-to-order

Applicable inserts

Application	For finishing	
Inserts shape	53	
Tool holder type	SWACR/L□□E/F04	WC□X0402□□
	SWACR/L□□H06	WC□X06T3□□
	SWACR/L□□K08	WC□X0804□□

A107

General
turning

External turning tools



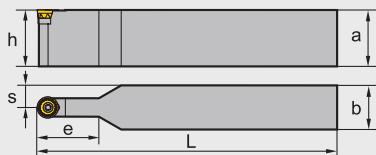
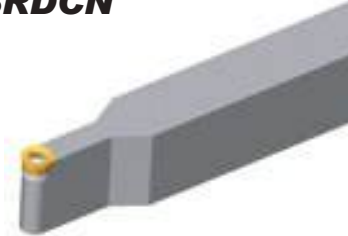
General Turning Tools

External turning tools

Corresponding tool holders of insert **RC** ☐ ☐

S-type clamping

SRDCN



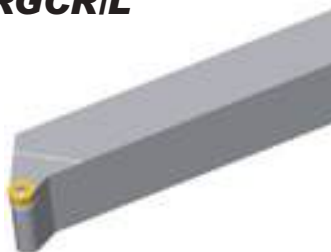
Type	Stock	Basic dimensions(mm)							Screw	Shim	Shim screw	Wrench
		a	b	L	h	s	e					
SRDCN	1616H08	△	16	16	100	16	8	16	I60M3×7	---	---	WT10IP
	2020K08	△	20	20	125	20	10	16				
	2525M08	△	25	25	150	25	12.5	16				
	2020K10	△	20	20	125	20	10	20	I60M3.5×10	---	---	WT15IP
	2525M10	▲	25	25	150	25	12.5	20				
	2525M12	▲	25	25	150	25	12.5	35	I60M3.5×12	R12BS	SM5×8.65XA	WT15IP WH35L
	3232P12	△	32	32	170	32	16	35				
	3225P16	▲	32	25	170	32	12.5	35	I60M4×15X	R16BS	SM6×10XA	WT15IP WH40L
	4040S16	△	40	40	250	40	20	40				

▲ Stock available

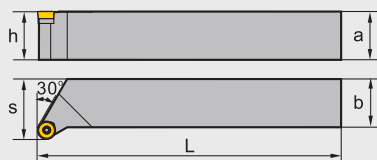
△ Make-to-order

Applicable inserts

Application	For semi-finishing	For roughing	For AI machining
Inserts shape	 A96	 A96	LH  A96
Tool holder type	SRDCN□□K/M/H08	RCMT0803MO	RCMT0803MO
	SRDCN□□K/M10	RCMT10T3MO	RCMT10T3MO
	SRDCN□□M/P12	RCMT1204MO	RCMT1204MO
	SRDCN□□P/S16	RCMT1606MO	RCMT1606MO

Corresponding tool holders of insert **RC** ☐ ☐ S-type clamping**SRGCR/L**

R-type shown



Type		Stock		Basic dimensions(mm)					Screw	Shim	Shim screw	Wrench
		R	L	a	b	L	h	s				
SRGCR/L	1616H08	△	△	16	16	100	16	20	I60M3×7	---	---	WT10IP
	2020K08	△	△	20	20	125	20	25				
	2525M08	△	△	25	25	150	25	32				
	1616H10	△	△	16	16	100	16	20	I60M3.5×10	---	---	WT15IP
	2020K10	▲	▲	20	20	125	20	25				
	2525M10	▲	▲	25	25	150	25	32				
	2020K12	▲	△	20	20	125	20	27	I60M3.5×12	R12BS	SM5×8.65XA	WT15IP WH35L
	2525M12	▲	▲	25	25	150	25	32				
	3232P16	▲	△	32	32	170	32	40	I60M4×15X	R16BS	SM6×10XA	WT15IP WH40L

▲ Stock available

△ Make-to-order

Applicable inserts

Application	For semi-finishing	For roughing	For AI machining
Inserts shape	 A96	 A96	LH  A96
Tool holder type	SRGCR/L□□H/K/M08	RCMT0803MO	RCMT0803MO
	SRGCR/L□□H/K/M10	RCMT10T3MO	RCMT10T3MO
	SRGCR/L□□K/M12	RCMT1204MO	RCMT1204MO
	SRGCR/L□□P16	RCMT1606MO	RCMT1606MO

General turning

External turning tools



TURNING General Turning Tools

External turning tools

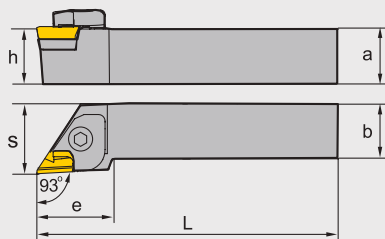
Corresponding tool holders of insert **KNUX** ☐ ☐ C-type clamping

CKJNR/L

Kr:93°



R-type shown



Type		Stock	Basic dimensions(mm)						Applicable inserts	Clamp	Clamp screw	Spring	Clamping stud	Shim	Shim screw	Wrench
			a	b	L	h	s	e								
CKJNR	2525M16	△	25	25	150	25	32	32	KNUX1604□□R A87	C6R1T	CM6×25A	SPR1 SPR2	P0515	K16CC	SM3×10B	WH20L WH40L
	3232P16	△	32	32	170	32	40	32								
	4040R16	△	40	40	200	40	50	32								
CKJNL	2525M16	△	25	25	150	25	32	32	KNUX1604□□L A87	C6L1T	CM6×25A	SPR1 SPR2	P0515	K16CCL	SM3×10B	WH20L WH40L
	3232P16	△	32	32	170	32	40	32								
	4040R16	△	40	40	200	40	50	32								

▲Stock available

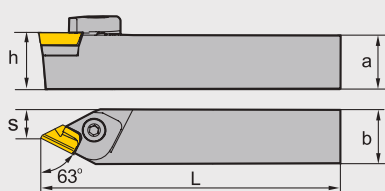
△Make-to-order

CKNNR/L

Kr:63°



R-type shown



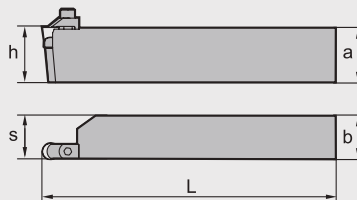
Type		Stock	Basic dimensions(mm)						Applicable inserts	Clamp	Clamp screw	Spring	Clamping stud	Shim	Shim screw	Wrench
			a	b	L	h	s									
CKNNR	2525M16	△	25	25	150	25	14.3		KNUX1604□□R A87	C6R1T	CM6×25A	SPR1 SPR2	P0515	K16CC	SM3×10B	WH20L WH40L
	3232P16	△	32	32	170	32	16.8									
CKNNL	2525M16	△	25	25	150	25	14.3		KNUX1604□□L A87	C6L1T	CM6×25A	SPR1 SPR2	P0515	K16CCL	SM3×10B	WH20L WH40L
	3232P16	△	32	32	170	32	16.8									

▲Stock available

△Make-to-order

Corresponding tool holders of insert **RC/P** ☐ ☐ C-type clamping**CRDCR/L**
CRDPR/L

R-type shown



Type		Stock		Basic dimensions(mm)						Applicable inserts	Clamp	Clamping screw	Wrench	Shim
		R	L	a	b	L	h	s	Ar					
CRDCR/L	2525M09V-19	△	△	25	25	150	25	25.5	19	RCGN0907 ☐ ☐ A152	C3RH	M5*16(GB70-85)	WH40L	RC09XC
	3232P09V-28	△	△	32	32	170	32	32.5	28					
	4040S09V-38	△	△	40	40	250	40	40.5	38					
	2525M12V-19	△	△	25	25	150	25	25.5	19	RCGN1207 ☐ ☐ A152	C4RH	M6*20(GB70-85)	WH50L	RC12XC
	3232P12V-28	△	△	32	32	170	32	32.5	28					
	4040S12V-38	△	△	40	40	250	40	40.5	38					
CRDPR/L	2525M09V-19	△	△	25	25	150	25	25.5	19	RPGN0907 ☐ ☐ A152	C3RH	M5*16(GB70-85)	WH40L	RP09XC
	3232P09V-28	△	△	32	32	170	32	32.5	28					
	4040S09V-38	△	△	40	40	250	40	40.5	38					
	2525M12V-19	△	△	25	25	150	25	25.5	19	RPGN1207 ☐ ☐ A152	C4RH	M6*20(GB70-85)	WH50L	RP12XC
	3232P12V-28	△	△	32	32	170	32	32.5	28					
	4040S12V-38	△	△	40	40	250	40	40.5	38					

▲Stock available

△Make-to-order

General turning

External turning tools for ceramic inserts



General Turning Tools

How to select internal turning tools

How to select internal turning tools

Explanation of internal turning tools detailed table

- Listed according to clamping types.

Approach angle of tools

Tools type

The first 4 letters in the type description stands for tool shape and applicatio.

Insert type

Specification chart

Application chart

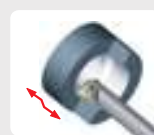
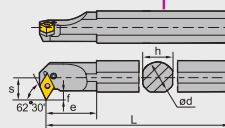
The arrow shows suitable applications such as internal turning, profiling and end turning, etc.

Corresponding tool holders of insert **DN** ☐ ☐ P-type clamping

PDPNR/L
Kr:62°30'



R-type shown



Type	Stock		Basic dimensions(mm)					Screw	Wrench	Lever	Shim	Shim pin
	R	L	Dmin	ød	h	L	S					
S32T-PDPNR/L15-3	▲	▲	40	32	30	300	22	LEM8×21	WH30L	L4	D15AP	SP4
S40U-PDPNR/L15-3	▲	▲	50	40	38	350	27					
S32T-PDPNR/L15	△	△	40	32	30	300	22	LEM8×21	WH30L	L4B	D15AP	SP4
S40U-PDPNR/L15	△	△	50	40	38	350	27					

▲ Stock available △ Make-to-order

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining	PCBN/PCD inserts
Inserts shape	DF Wiper A61	WGM Wiper A63	DR Double side A65	HDR A66	Without chipbreaker A66	A121 A122 A123
	WGFF Wiper A61	PM A63	DR Single side A65			A122 A123
	SF A62	DM A64	ER Double side A65			A123
	EF A62	EM A64	ER Single side A65			
	NF A62	NM A64	SNR Double side A65			
	NGF A62		LR Single side A65			
Tool holder type	□□-PDPNR/L15-3 DN□□1504□□ DN□□1504□□ DN□□1504□□ DN□□1504□□ DN□□1504□□ □□-PDPNR/L15 DN□□1506□□ DN□□1506□□ DN□□1506□□ DN□□1506□□ DN□□1506□□					

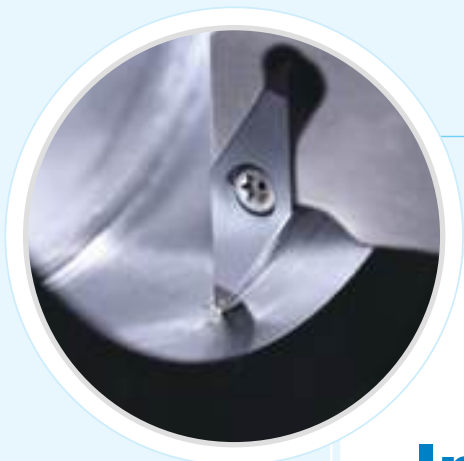
Tool holders with oil hole

Products specification

Including product description, stock (left and right hand), basic dimensions and applicable spare parts.

Applicable inserts

Including applications of inserts, reference page, insert shape and corresponding tool holders.



TURNING



Internal turning tools >>>

Internal turning tools overview • A209

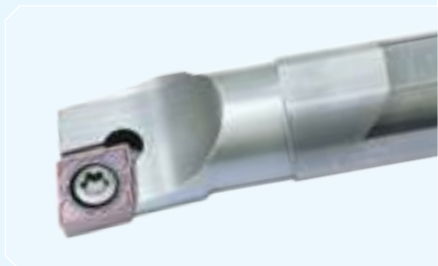
Internal turning tools code key • A210-A211

Detailed table of internal turning tools • A212-A240

Internal turning Tools by P-type clamping • A212-A217

Internal turning tools by S-type clamping • A218-A233

Damping internal turning tools and their features • A234-A240



Internal turning tools





Name	Feature	62°30'	75°	90°	90°	93°	93°	95°	95°	107°30'
P-type internal turning tools	- The minimum machining diameter is 20mm. - Applicable inserts are economic negative inserts. - Hole clamping									
		PDPN A213	PSKN A215	PTFN A216			PDUN A214		PCLN A212	
S-type internal turning tools	- The minimum machining diameter is 10mm. - Applicable inserts are 5°, 7° and 11° positive inserts. - Screw clamping.		SSKC A222	SCFC A232	STFC A223	STUP A231	SDUC A220	SDZC A221		SDQC A219
							SDUP A230		SCLC A218	SDQP A229
							SVUC A225		 A233	SVQB A226
							SVUB A227		SCLP A228	SVQC A224
Damping internal turning tools	- The minimum diameter can be machined is 12mm. - Applicable inserts are 7°, 11° positive inserts. - Good Performance on reducing shake.					STUP A238	SDUP A237		SCLP A235	SDQP A236
							SVUC A240			SVQC A239



TURNING General Turning Tools

Internal turning tools code key

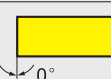
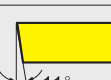
General turning

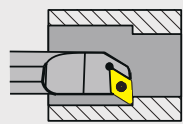
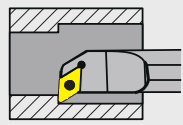
Internal turning tools code key

Type of tool holder		Diameter of tool holder	Length of tool holder	Clamping system	Inserts shape	
Code	Type					
A	Steel tool holder with oil-hole					
C	Cemented carbide tool holder	Code Diameter	Code Length			
E	Cemented carbide tool holder with oil hole	08 08	H 100			
S	Steel tool holder	10 10	K 125			
X	Special inserts applied	16 16	M 150			
		20 20	N 160			
		25 25	Q 180			
		32 32	R 200			
		40 40	S 250			
		50 50	T 300			
			U 350			
			V 400			

S 16 R - S D U

Tool holder style and approach angle							
A	B	C	D	E	F	G	H
J	K	L	M	N	O	P	Q
R	S	T	U	V	W	X	

Clearance angle of insert	
	B
	C
	D
	E
	N
	P

Cutting direction	
	L - Left hand
	R - Right hand

Manufacture option	
D	Increase offset f size+1.0mm
E	Increase offset f size+2.0mm
R	Round shank
W	Wedge clamping
X	Back boring

C
R
07

General
turning

Internal turning tools code key

Length of cutting edge							
Inserts shape	C	D	R	S	T	V	W
							
Inscribed circle	Length of cutting edge(mm)						
5.556	---	---	---	---	09	---	---
6.350	06	07	---	---	11	---	---
9.525	09	11	09	09	16	16	06
12.700	12	15	12	12	22	22	08
15.875	16	19	15	15	27	---	---
19.050	19	---	19	19	33	---	---
25.400	25	---	25	25	44	---	---



TURNING / General Turning Tools

Internal turning tools

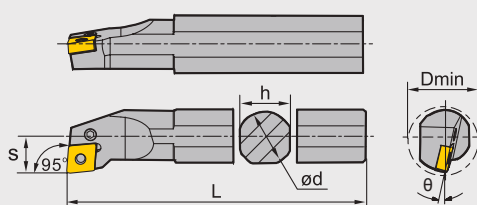
Corresponding tool holders of insert **CN** ☐ ☐ P-type clamping

PCLNR/L

Kr:95°



R-type shown



Type	Stock		Basic dimensions(mm)					Screw	Wrench	Lever	Shim	Shim pin
	R	L	Dmin	ød	h	L	S					
S16Q-PCLNR/L09	△	△	20	16	15	180	10					
S20R-PCLNR/L09	△	△	25	20	19	200	12.5	LEM5×12	WH20L	L3C	---	---
S25S-PCLNR/L09	△	△	32	25	24	250	15					
S25S-PCLNR/L12	△	△	32	25	24	250	16	LEM6×14	WH25L	L4A	---	---
S32T-PCLNR/L12	▲	▲	40	32	30	300	21					
S40U-PCLNR/L12	▲	▲	50	40	38	350	26	LEM8×21	WH30L	L4	C12APB	SP4
S50V-PCLNR/L12	▲	▲	63	50	48	400	31					
S50V-PCLNR/L16	△	△	63	50	48	400	31	LEM8×25	WH30L	L5	C16AP	SP5
S50S-PCLNR/L19	△	△	63	50	47	250	35					
S50W-PCLNR/L19	▲	▲	63	50	47	450	35	LEM10×27	WH40L	L6	C19AP	SP6

▲Stock available

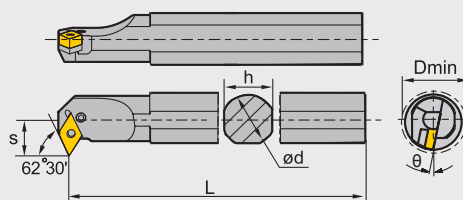
△Make-to-order

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining	PCBN/PCD inserts
Inserts shape	DF  A54	WGM Wiper  A55	DR Double-side  A58	HDR  A59	Without chipbreaker  A59	 A118
	WGF Wiper  A54	PM  A55	DR Single-side  A58	HPR  A59		 A118 -A119
	SF  A54	DM  A56	ER Double-side  A58			 A119
	EF  A54	EM  A56	ER Single-side  A58			
	NF  A55	NM  A57	SNR Double-side  A58			
			LR Single-side  A57			
Tool holder type	□□-PCLNR/L09	CN□□0903□□	CN□□0903□□			
	□□-PCLNR/L12	CN□□1204□□	CN□□1204□□	CN□□1204□□	CN□□1204□□	CN□□1204□□
	□□-PCLNR/L16	CN□□1606□□	CN□□1606□□	CN□□1606□□	CN□□1606□□	
	□□-PCLNR/L19		CN□□1906□□	CN□□1906□□	CN□□1906□□	

Corresponding tool holders of insert **DN** ☐ ☐ P-type clamping**PDPNR/L****Kr:62° 30'**

R-type shown



Type	Stock		Basic dimensions(mm)					Screw	Wrench	Lever	Shim	Shim pin
	R	L	Dmin	ød	h	L	S					
S32T-PDPNR/L15-3	▲	▲	40	32	30	300	22	LEM8×21	WH30L	L4	D15AP	SP4
S40U-PDPNR/L15-3	▲	▲	50	40	38	350	27					
S32T-PDPNR/L15	△	△	40	32	30	300	22	LEM8×21	WH30L	L4B	D15AP	SP4
S40U-PDPNR/L15	△	△	50	40	38	350	27					

▲Stock available

△Make-to-order

General turning

Internal turning tools

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining	PCBN/PCD inserts
Inserts shape	DF Wiper A61	WGM Wiper A63	DR Double-side A65	HDR A66	Without chipbreaker A66	A121 -A122
	WGF Wiper A61	PM A63	DR Single-side A65			A122 -A123
	SF A62	DM A64	ER Double-side A65			A123
	EF A62	EM A64	ER Single-side A65			
	NF A62	NM A64	SNR Double-side A65			
	NGF A62		LR Single-side A65			
Tool holder type	☐ -PDPNR/L15-3	DN□□1504□□	DN□□1504□□	DN□□1504□□	DN□□1504□□	DN□□1504□□
	☐ -PDPNR/L15	DN□□1506□□	DN□□1506□□	DN□□1506□□	DN□□1506□□	DN□□1506□□



TURNING / General Turning Tools

Internal turning tools

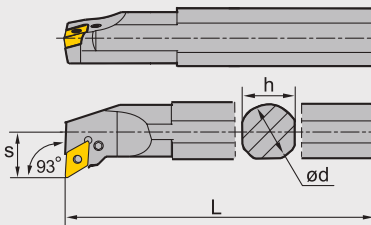
Corresponding tool holders of insert **DN** ☐ ☐ P-type clamping

PDUNR/L

Kr:93°



R-type shown



Type	Stock		Basic dimensions(mm)					Screw	Wrench	Lever	Shim	Shim pin
	R	L	Dmin	ød	h	L	S					
S20R-PDUNR/L11	△	△	25	20	19	200	13	LEM5×12	WH20L	L3D	---	---
S25S-PDUNR/L11	△	△	32	25	24	250	17					
S32T-PDUNR/L15	△	△	40	32	30	300	23	LEM8×21	WH30L	L4B	D15AP	SP4
S32T-PDUNR/L15-3	△	△	40	32	30	300	23	LEM8×21	WH30L	L4	D15AP	SP4
S40U-PDUNR/L15	△	△	50	40	38	350	27	LEM8×21	WH30L	L4B	D15AP	SP4
S40U-PDUNR/L15-3	▲	▲	50	40	38	350	27	LEM8×21	WH30L	L4	D15AP	SP4

▲Stock available

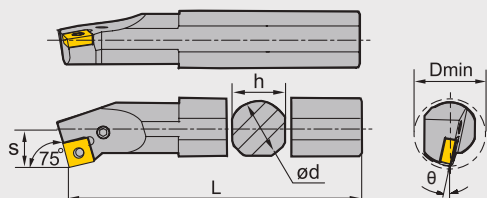
△Make-to-order

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining	PCBN/PCD inserts
Inserts shape	DF  A61	WGM Wiper  A63	DR Double-side  A65	HDR  A66	Without chipbreaker  A66	 A121 -A122
	WGF Wiper  A61	PM  A63	DR Single-side  A65			 A122 -A123
	SF  A62	DM  A64	ER Double-side  A65			 A123
	EF  A62	EM  A64	ER Single-side  A65			
	NF  A62	NM  A64	SNR Double-side  A65			
	NGF  A62		LR Single-side  A65			
Tool holder type	☐ -PDUNR/L11	DN ☐ 1104 ☐	DN ☐ 1104 ☐	DN ☐ 1104 ☐		
	☐ -PDUNR/L15-3	DN ☐ 1504 ☐	DN ☐ 1504 ☐	DN ☐ 1504 ☐	DN ☐ 1504 ☐	DN ☐ 1504 ☐
	☐ -PDUNR/L15	DN ☐ 1506 ☐	DN ☐ 1506 ☐	DN ☐ 1506 ☐	DN ☐ 1506 ☐	DN ☐ 1506 ☐

Corresponding tool holders of insert **SN** ☐ ☐ P-type clamping**PSKNR/L****Kr:75°**

R-type shown



Type	Stock		Basic dimensions(mm)					Screw	Wrench	Lever	Shim	Shim pin
	R	L	Dmin	ød	h	L	S					
S25S-PSKNR/L12	▲	▲	32	25	24	250	17	LEM6×14	WH25L	L4A	---	---
S32T-PSKNR/L12	△	△	41	32	30	300	22	LEM8×21	WH30L	L4	S12APB	SP4
S40U-PSKNR/L12	△	△	50	40	38	350	27					

▲Stock available

△Make-to-order

General turning

Internal turning tools

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For heavy machining	For roughing	PCBN/PCD inserts
Inserts shape	DF  A67	PM  A68	DR Double-side  A70	HDR  A72	Without chipbreaker  A74	 A126
	EF  A67	DM  A68	DR Single-side  A70 -71	HPR  A72		 A127
	SF  A67	EM  A69	ER Double-side  A71			 A128
		NM  A69	ER Single-side  A71			
			SNR Double-side  A71			
			LR Single-side  A69			
Tool holder type	☐ ☐ -PSKNR/L12	SN ☐ 1204 ☐	SN ☐ 1204 ☐	SN ☐ 1204 ☐	SN ☐ 1204 ☐	SN ☐ 1204 ☐



TURNING / General Turning Tools

Internal turning tools

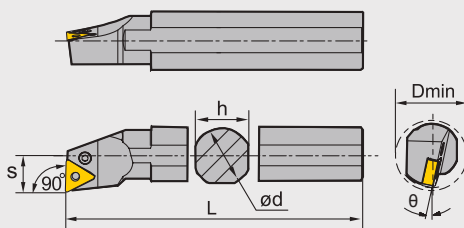
Corresponding tool holders of insert **TN** ☐ ☐ P-type clamping

PTFNR/L

Kr:90°



R-type shown



Type	Stock		Basic dimensions(mm)					Screw	Wrench	Lever	Shim	Shim pin
	R	L	Dmin	ød	h	L	S					
S25S-PTFNR/L16	▲	▲	32	25	24	250	16	LEM5×12	WH20L	L3B	---	---
S32T-PTFNR/L16	△	△	41	32	30	300	21	LEM6×17	WH25L	L3	T16APB	SP3
S40U-PTFNR/L16	△	△	50	40	38	350	26					

▲Stock available

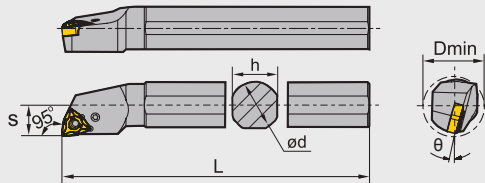
△Make-to-order

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining	PCBN/PCD inserts
Inserts shape	DF  A75	WGM Wiper  A76	DR Double-side  A78	HDR  A79	Without chipbreaker  A80	 A130
	WG Wiper  A75	PM  A76	DR Single-side  A78			 A130 -A131
	SF  A75	DM  A77	ER Double-side  A78			 A131
	EF  A76	EM  A77	SNR Double-side  A78			
			LR Single-side  A77			
Tool holder type	□□-PTFNR/L16 TN□□1604□□ TN□□1604□□ TN□□1604□□ TN□□1604□□ TN□□1604□□ TN□□1604□□					

Corresponding tool holders of insert **WN** ☐ ☐ P-type clamping**PWLNRL****Kr:95°**

R-type shown



Type	Stock		Basic dimensions(mm)					Screw	Wrench	Lever	Shim	Shim pin
	R	L	Dmin	ød	h	L	S					
S16R-PWLNRL/L06	△	△	20	16	15	200	10	LEM5X12	WH20L	L3D	---	---
S20R-PWLNRL/L06	△	△	25	20	19	200	12			L3B		
S25S-PWLNRL/L06	△	△	35	25	24	250	15					
S20R-PWLNRL/L08	△	△	23	20	19	200	12.5	LEM6X14	WH25L	L4A	---	---
S25S-PWLNRL/L08	△	△	32	25	24	250	16					
S32T-PWLNRL/L08	△	△	41	32	30	300	21	LEM8X21	WH30L	L4	W08AP	SP4

▲Stock available

△Make-to-order

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For cast iron machining	PCBN/PCD inserts	
Inserts shape	DF  A83	WGM Wiper  A84	DR Double-side  A86	Without chipbreaker  A86	 A136	
	WGF Wiper  A83	PM  A85	SNR Double-side  A86		 A136 -A137	
	SF  A83	DM  A85			 A137	
	EF  A84	EM  A85				
	NF  A84	NM  A86				
Tool holder type	☐ -PWLNR/L06	WN ☐ ☐ 0604 ☐ ☐	WN ☐ ☐ 0604 ☐ ☐	WN ☐ ☐ 0604 ☐ ☐	WN ☐ ☐ 0604 ☐ ☐	
	☐ -PWLNR/L08	WN ☐ ☐ 0804 ☐ ☐	WN ☐ ☐ 0804 ☐ ☐	WN ☐ ☐ 0804 ☐ ☐	WN ☐ ☐ 0804 ☐ ☐	WN ☐ ☐ 0804 ☐ ☐

General turning

Internal turning tools



TURNING General Turning Tools

Internal turning tools

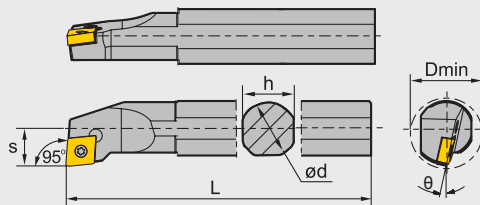
Corresponding tool holders of insert **CC** ☐ ☐ S-type clamping

SCLCR/L

Kr:95°



R-type shown



Type	Stock		Basic dimensions(mm)					Screw	Wrench	Shim	Shim screw
	R	L	Dmin	ød	h	L	S				
S08K-SCLCR/L06	▲	▲	10	8	7.4	125	5	I60M2.5×5.5	WT07IP	---	---
S10K-SCLCR/L06	▲	▲	13	10	9	125	6.5				
S12M-SCLCR/L06	▲	▲	16	12	11	150	9				
S12M-SCLCR/L09	▲	▲	16	12	11	150	9	I60M3.5×8	WT15IP	---	---
S14N-SCLCR/L09	△	△	18	14	13	160	9				
S16Q-SCLCR/L09	△	△	20	16	15	180	10				
S20R-SCLCR/L09	△	△	25	20	19	200	12	I60M3.5×10	WT15IP	---	---
S25S-SCLCR/L09	△	△	32	25	24	250	15.5				
S20R-SCLCR/L12	△	△	25	20	19	200	12.5	I60M4×11X	WT15IP	---	---
S25S-SCLCR/L12	▲	▲	32	25	24	250	15.5	I60M4×11X	WT15IP	---	---
S32T-SCLCR/L12	△	△	39	32	30	300	20	I60M4×11X	WH40L	C12BS	SM6×10×A
S40U-SCLCR/L12	△	△	50	40	38	350	24.5		WT15IP		

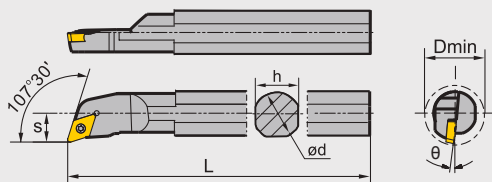
▲Stock available △Make-to-order

Applicable inserts

Application	For extra finishing	For finishing	For semi-finishing	For roughing	For Al machining	For cast iron machining Without chipbreaker	PCBN/PCD inserts
Inserts shape	USF  A89	HF  A89	HM  A90	HR  A91	LH  A91-92	 A92	 A139
	SF  A89	EF  A90	EM  A90		LC  A91		 A144
Tool holder type	□□-SCLCR/L06 CC□□0602□□ CC□□0602□□ CC□□0602□□ CC□□0602□□ CCGX0602□□ CC□□0602□□ CC□□0602□□						
	□□-SCLCR/L09 CC□□09T3□□ CC□□09T3□□ CC□□09T3□□ CC□□09T3□□ CCGX09T3□□ CC□□09T3□□ CC□□09T3□□						
	□□-SCLCR/L12 CC□□1204□□ CC□□1204□□ CC□□1204□□ CCGX1204□□ CC□□1204□□ CC□□1204□□						

Corresponding tool holders of insert **DC** ☐ ☐ S-type clamping**SDQCR/L****Kr:107° 30'**

R-type shown



Type	Stock		Basic dimensions(mm)					Screw	Wrench	---	---
	R	L	Dmin	ød	h	L	S			---	---
S10K-SDQCR/L07	▲	▲	13	10	9	125	7	I60M2.5×5.5		---	---
S12M-SDQCR/L07	▲	▲	16	12	11	150	9				
S16Q-SDQCR/L07	△	△	20	16	15	180	11				
S20R-SDQCR/L11	△	△	25	20	19	200	13	I60M3.5×8		---	---
S25S-SDQCR/L11	△	△	32	25	24	250	17				
S32T-SDQCR/L11	△	△	40	32	30	300	22				
S40T-SDQCR/L11	△	△	50	40	38	350	27				

▲Stock available

△Make-to-order

Applicable inserts

Application	For extra finishing	For finishing	For semi-finishing	For roughing	For Al machining	For cast iron machining	PCBN/PCD inserts
Inserts shape	USF  A93	HF  A93	HM  A94	HR  A95	LH  A95	Without chipbreaker  A95	 A140
	SF  A93	EF  A94	EM  A94		LC  A95		 A145
Tool holder type	☐ -SDQCR/L07	DC ☐ 0702 ☐	DC ☐ 0702 ☐	DC ☐ 0702 ☐	DCGX0702 ☐	DC ☐ 0702 ☐	DC ☐ 0702 ☐
	☐ -SDQCR/L11	DC ☐ 11T3 ☐	DC ☐ 11T3 ☐	DC ☐ 11T3 ☐	DCGX11T3 ☐	DC ☐ 11T3 ☐	DC ☐ 11T3 ☐

General turning

Internal turning tools



TURNING General Turning Tools

Internal turning tools

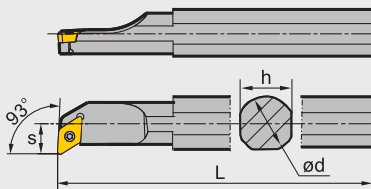
Corresponding tool holders of insert **DC** ☐ ☐ S-type clamping

SDUCR/L

Kr:93°



R-type shown



Type	Stock		Basic dimensions(mm)					Screw	Wrench	---	---
	R	L	Dmin	ød	h	L	S				
S10K-SDUCR/L07	▲	▲	13	10	9	125	7	I60M2.5×5.5	WT07IP	---	---
S12M-SDUCR/L07	▲	▲	16	12	11	150	9				
S16Q-SDUCR/L07	△	△	20	16	15	180	11	I60M2.5×6.5	WT15IP	---	---
S20R-SDUCR/L11	△	△	25	20	19	200	13				
S25S-SDUCR/L11	△	△	32	25	24	250	17	I60M3.5×10	WT15IP	---	---
S32T-SDUCR/L11	△	△	40	32	30	300	22				
S40U-SDUCR/L11	△	△	50	40	38	350	27				

▲Stock available

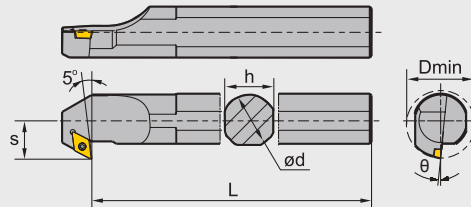
△Make-to-order

Applicable inserts

Application	For extra finishing	For finishing	For semi-finishing	For roughing	For Al machining	For cast iron machining	PCBN/PCD inserts
Inserts shape	USF  A93	HF  A93	HM  A94	HR  A95	LH  A95	Without chipbreaker  A95	 A140
	SF  A93	EF  A94	EM  A94		LC  A95		 A145
Tool holder type	☐ SDUCR/L07	DC□□0702□□	DC□□0702□□	DC□□0702□□	DCGX0702□□	DC□□0702□□	DC□□0702□□
	☐ SDUCR/L11	DC□□11T3□□	DC□□11T3□□	DC□□11T3□□	DCGX11T3□□	DC□□11T3□□	DC□□11T3□□

Corresponding tool holders of insert **DC** ☐ ☐ S-type clamping**SDZCR/L****Kr:95°**

R-type shown



Type	Stock		Basic dimensions(mm)					Screw	Wrench	Shim	Shim screw
	R	L	Dmin	ød	h	L	S				
S25S-SDZCR/L11	△	△	33	25	24	250	18	I60M3.5×10	WT15IP	---	---
S32T-SDZCR/L11	△	△	40	32	30	300	22	I60M3.5×12	WT15IP	D11BS	SM5×8.65XA
S40U-SDZCR/L11	△	△	48	40	38	350	27		WH35L		

▲Stock available

△Make-to-order

General turning

Internal turning tools

Applicable inserts

Application	For extra finishing	For finishing	For semi-finishing	For roughing	For Al machining	For cast iron machining	PCBN/PCD inserts
Inserts shape	USF  A93	HF  A93	HM  A94	HR  A95	LH  A95	Without chipbreaker  A95	 A140
	SF  A93	EF  A94	EM  A94		LC  A95		 A145
Tool holder type	□□-SDZCR/L11						
	DC□□11T3□□						
	DC□□11T3□□						
	DC□□11T3□□						
	DC□□11T3□□						
	DCGX11T3□□						
	DC□□11T3□□						
	DC□□11T3□□						



TURNING / General Turning Tools

Internal turning tools

Corresponding tool holders of insert **SC** ☐ ☐

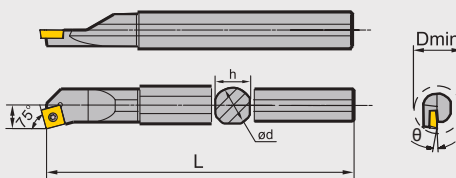
S-type clamping

SSKCRIL

Kr:75°



R-type shown



Type	Stock		Basic dimensions(mm)					Screw	Wrench	Shim	Shim screw
	R	L	Dmin	ød	h	L	S				
S12M-SSKCR/L09	▲	△	16	12	11	150	9	I60M3.5×8	WT15IP	---	---
S16Q-SSKCR/L09	△	△	20	16	15	180	11				
S20R-SSKCR/L09	△	△	25	20	19	200	13				
S25S-SSKCR/L12	△	△	32	25	24	250	17	I60M4×11X	WT15IP	---	---
S32T-SSKCR/L12	△	△	40	32	30	300	22		WT15IP WH40L		

▲Stock available

△Make-to-order

Applicable inserts

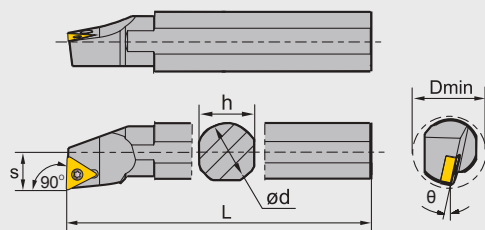
Application	For finishing	For semi-finishing	For roughing	For Al machining	For cast iron machining
Inserts shape	HF  A98	HM  A98	HR  A99	LH  A99	Without chipbreaker  A99
	EF  A98	EM  A98		LC  A99	
Tool holder type	☐ ☐ -SSKCR/L09	SC ☐ ☐ 09T3 ☐ ☐	SC ☐ ☐ 09T3 ☐ ☐	SCGX09T3 ☐ ☐	SC ☐ ☐ 09T3 ☐ ☐
	☐ ☐ -SSKCR/L12		SC ☐ ☐ 1204 ☐ ☐	SCGX1204 ☐ ☐	SC ☐ ☐ 1204 ☐ ☐

Corresponding tool holders of insert **TC** ☐ ☐

S-type clamping

STFCR/L**Kr:90°**

R-type shown



Type	Stock		Basic dimensions(mm)					Screw	Wrench	Shim	Shim screw
	R	L	Dmin	ød	h	L	S				
S12M-STFCR/L11	▲	▲	16	12	11	150	9	I60M2.5×6.5	WT07IP	---	---
S16Q-STFCR/L11	△	△	20	16	15	180	10				
S20R-STFCR/L11	△	△	25	20	19	200	12				
S25S-STFCR/L16	△	△	32	25	24	250	16	I60M3.5×10	WT15IP	---	---
S32T-STFCR/L16	△	△	40	32	30	300	21	I60M3.5×12	WT15IP WH35L	T16BS	SM5×8.65XA
S40U-STFCR/L16	△	△	50	40	38	350	25				

▲Stock available

△Make-to-order

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For Al machining	For cast iron machining	PCBN/PCD inserts
Inserts shape	HF  A101	HM  A103	HR  A103	LH  A104	Without chipbreaker  A104	 A141
	EF  A102	EM  A102		LC  A103		
Tool holder type	☐ ☐ -STFCR/L11	TC ☐ ☐ 1102 ☐ ☐	TC ☐ ☐ 1102 ☐ ☐	TCGX1102 ☐ ☐	TC ☐ ☐ 1102 ☐ ☐	TC ☐ ☐ 1102 ☐ ☐
	☐ ☐ -STFCR/L16	TC ☐ ☐ 16T3 ☐ ☐	TC ☐ ☐ 16T3 ☐ ☐	TCGX16T3 ☐ ☐	TC ☐ ☐ 16T3 ☐ ☐	TC ☐ ☐ 16T3 ☐ ☐

General turning

Internal turning tools



TURNING General Turning Tools

Internal turning tools

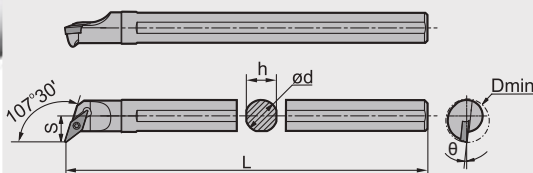
Corresponding tool holders of insert VC□□ S-type clamping

SVQCR/L

Kr:107°30'



R-type shown



Type	Stock		Basic dimensions(mm)					Screw	Wrench	Shim	Shim screw
	R	L	Dmin	ød	h	L	S				
S16Q-SVQCR/L11	▲	▲	22	16	15	180	13	I60M2.5×6.5	WT07IP	---	---
S20R-SVQCR/L16	△	△	27	16	19	200	14	I60M3.5×12	WT15IP WH35L	V16BSC	SM5×8.65×A
S25S-SVQCR/L16	△	△	35	25	24	250	20				
S32T-SVQCR/L16	△	△	42	32	30	300	23				

▲Stock available

△Make-to-order

Applicable inserts

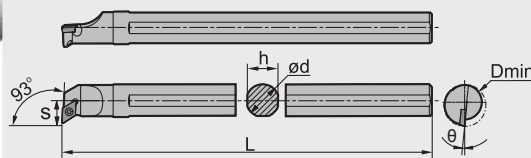
Application	For extra finishing	For finishing	For AI machining	PCBN/PCD inserts
Inserts shape	USF  A105	HF  A105	LH  A106	 A143
	SF  A105	NF  A105	LC  A106	 A148
Tool holder type	□□-SVQCR/L11	VC□□1103□□	VC□□1103□□	VCGX1103□□
	□□-SVQCR/L16	VC□□1604□□	VC□□1604□□	VCGX1604□□

Corresponding tool holders of insert **VC** ☐ ☐

S-type clamping

SVUCR/L**Kr:93°**

R-type shown



Type	Stock		Basic dimensions(mm)					Screw	Wrench	Shim	Shim screw
	R	L	Dmin	ød	h	L	S				
S16Q-SVUCR/L11	△	△	24	16	15	180	15	I60M2.5×6.5	WT07IP	---	---
S20R-SVUCR/L11	△	△	28	20	19	200	17				
S25S-SVUCR/L16	△	△	35	25	24	250	20	I60M3.5×12	WT15IP	V16BS	SM5×8.65×A
S32T-SVUCR/L16	△	△	42	32	30	300	23		WT15IP WH35L		

▲Stock available

△Make-to-order

General turning

Internal turning tools

Applicable inserts

Application	For extra finishing		For finishing		For AI machining		PCBN/PCD inserts
Inserts shape	USF	 A105	HF	 A105	LH	 A106	 A143
	SF	 A105	NF	 A105	LC	 A106	 A148
Tool holder type	☐ -SVUCR/L11		VC ☐ ☐ 1103 ☐ ☐		VCGX1103 ☐ ☐		
	☐ -SVUCR/L16		VC ☐ ☐ 1604 ☐ ☐		VC ☐ ☐ 1604 ☐ ☐		VC ☐ ☐ 1604 ☐ ☐



TURNING / General Turning Tools

Internal turning tools

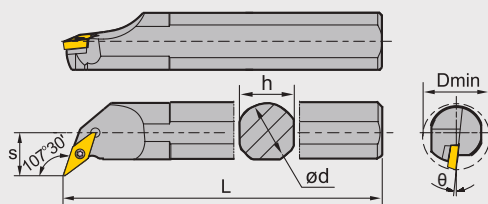
Corresponding tool holders of insert **VB** ☐ ☐ S-type clamping

SVQBR/L

Kr:107° 30'



R-type shown



Type	Stock		Basic dimensions(mm)					Screw	Wrench	Shim	Shim screw
	R	L	Dmin	ød	h	L	S				
S20R-SVQBR/L16	△	△	27	20	19	200	14	I60M3.5×12	WT15IP WH35L	V16BS	SM5×8.65XA
S25S-SVQBR/L16	△	△	35	25	24	250	20				
S32T-SVQBR/L16	▲	▲	42	32	30	300	23				

▲Stock available

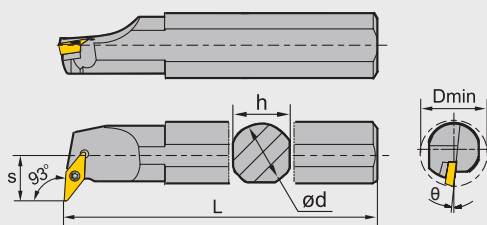
△Make-to-order

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	PCBN/PCD inserts
Inserts shape	EF  A108	HM  A109	HR  A109	 A147
	NF  A108	EM  A109	SNR  A109	 A147
	NGF  A108			
Tool holder type	☐ -SVQBR/L16	VB ☐ 1604 ☐	VB ☐ 1604 ☐	VB ☐ 1604 ☐

Corresponding tool holders of insert **VB** ☐ ☐ S-type clamping**SVUBR/L****Kr:93°**

R-type shown



Type	Stock		Basic dimensions(mm)					Screw	Wrench	Shim	Shim screw
	R	L	Dmin	ød	h	L	S				
S25S-SVUBR/L16	△	△	35	25	24	250	20	I60M3.5×12	WT15IP WH35L	V16BS	SM5×8.65XA
S32T-SVUBR/L16	△	△	42	32	30	300	23				

▲Stock available

△Make-to-order

General
turning

Internal turning tools

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	PCBN/PCD inserts
Inserts shape	EF  A108	HM  A109	HR  A109	 A147
	NF  A108	EM  A109	SNR  A109	 A147
	NGF  A108			
Tool holder type	☐ -SVUBR/L16	VB ☐ 1604 ☐	VB ☐ 1604 ☐	VB ☐ 1604 ☐



General Turning Tools

Internal turning tools

Corresponding tool holders of insert **CP** ☐ ☐

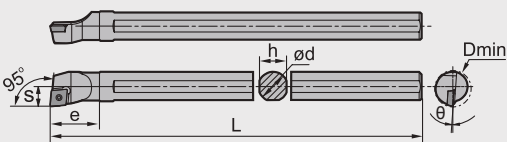
S-type clamping

SCLPR/L

Kr:95°



R-type shown



Type	Stock		Basic dimensions(mm)							Screw	Wrench	---	---
	R	L	Dmin	ød	h	L	S	θ	e			---	---
S10K-SCLPR/L06	▲	▲	12	10	9	125	6	-7°	17	I60M2.5×5.5	WT07IP	---	---
S12M-SCLPR/L06	▲	▲	16	12	11	150	8	-4°	20			---	---
S16Q-SCLPR/L09	▲	▲	20	16	15	180	10	-4°	29	I60M3.5×8	WT15IP	---	---
S20R-SCLPR/L09	△	△	25	20	18	200	13	-4°	35			---	---

▲Stock available

△Make-to-order

Applicable inserts

Application	For extra finishing	
Inserts shape	SF	
Tool holder type	☐ SCLPR/L06	CP ☐ ☐ 0602 ☐ ☐
	☐ SCLPR/L09	CP ☐ ☐ 09T3 ☐ ☐

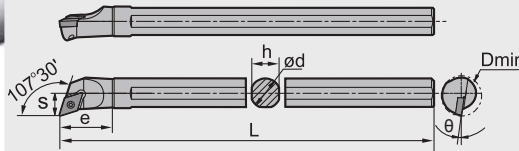
A110

Corresponding tool holders of insert **DP** ☐ ☐

S-type clamping

SDQPRIL
Kr:107° 30'


R-type shown



Type	Stock		Basic dimensions(mm)							Screw	Wrench	---	---
	R	L	Dmin	ød	h	L	S	θ	e			---	---
S10K-SDQPR/L07	△	△	13	10	9	125	7	-8°	20	I60M2.5×5.5	WT07IP	---	---
S12M-SDQPR/L07	▲	△	16	12	11	150	9	-8°	22			---	---
S16Q-SDQPR/L07	▲	△	20	16	15	180	11	-6°	27			---	---
S16Q-SDQPR/L11	▲	△	20	16	15	180	11	-6°	32	I60M3.5×8	WT15IP	---	---
S16Q-SDQPR/L11	△	△	25	20	18	200	13	-6°	33			---	---

▲Stock available

△Make-to-order

Applicable inserts

Application	For extra finishing	
Inserts shape	USF	
	SF	
Tool holder type	☐ -SDQPR/L07	DP ☐ ☐ 0702 ☐ ☐
	☐ -SDQPR/L11	DP ☐ ☐ 11T3 ☐ ☐

A111

A111



General turning

Internal turning tools



TURNING / General Turning Tools

Internal turning tools

Corresponding tool holders of insert **DP** ☐ ☐

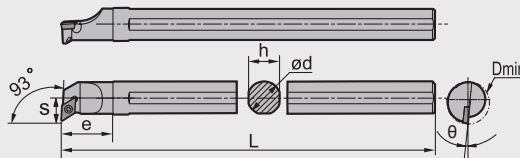
S-type clamping

SDUPRIL

Kr:93°



R-type shown



Type	Stock		Basic dimensions(mm)							Screw	Wrench	---	---
	R	L	Dmin	ød	h	L	S	θ	e			---	---
S10K-SDUPR/L07	▲	▲	15	10	9	125	9	-8°	18	I60M2.5×5.5	WT071P	---	---
S12M-SDUPR/L07	▲	△	16	12	11	150	9	-8°	19			---	---
S16Q-SDUPR/L07	△	△	20	16	15	180	11	-6°	25			---	---

▲ Stock available

△ Make-to-order

Applicable inserts

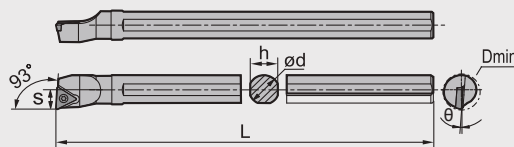
Application	For extra finishing
Inserts shape	SF  A111
Tool holder type	DP□□0702□□

Corresponding tool holders of insert **TP** ☐ ☐

S-type clamping

STUPRIL**Kr:93°**

R-type shown



Type	Stock		Basic dimensions(mm)					Screw	Wrench	---	---
	R	L	Dmin	ød	h	L	S			---	---
S10M-STUPR/L09	△	△	13	10	9.4	150	6	I60M2.2×5.5	WT07IP	---	---
S10M-STUPR/L11	△	△	13	10	9.4	150	6			---	---
S12Q-STUPR/L11	△	△	16	12	11.4	180	7.5	I60M2.5×6.5	WT07IP	---	---
S16R-STUPR/L11	△	△	20	16	15	200	10			---	---

▲Stock available

△Make-to-order

Applicable inserts

Application	For extra finishing
Inserts shape	SF  A113
Tool holder type	
☐ -STUPR/L09	TP□□0902□□
☐ -STUPR/L11	TP□□1103□□



A231

General turning

Internal turning tools



TURNING General Turning Tools

Internal turning tools

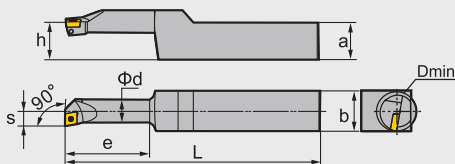
Corresponding tool holders of insert **CC** ☐ ☐ S-type clamping

SCFCR/L

Kr:90°



R-type shown



Type	Stock		Basic dimensions(mm)							Screw	Wrench	---	---
	R	L	Dmin	ød	L	s	a	b	e			---	---
S10M-SCFCR/L06S25	▲	▲	13	10	150	7	27	25	30	I60M2.5×5.5	WT07IP	---	---
S12P-SCFCR/L06S25	▲	▲	16	12	170	9	27	25	35	I60M2.5×6.5		---	---
S16Q-SCFCR/L09S25	▲	▲	20	16	180	11	27	25	40	I60M3.5×8	WT15IP	---	---
S20R-SCFCR/L09S25	△	△	25	20	200	13	27	25	45			---	---
S25R-SCFCR/L12S25	△	△	30	25	200	16	27	25	50	I60M4×11X		---	---

▲Stock available

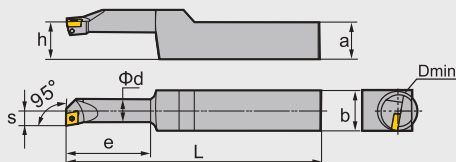
△Make-to-order

Applicable inserts

Application	For extra finishing	For finishing	For semi-finishing	For roughing	For Al machining	For cast iron machining	PCBN/PCD inserts	
Inserts shape	USF  A89	HF  A89	HM  A90	HR  A91	LH  A91-92	Without chipbreaker  A92	 A139	
	SF  A89	EF  A90	EM  A90		LC  A91		 A144	
Tool holder type	☐ SCFCR/L06S25	CC□□0602□□	CC□□0602□□	CC□□0602□□	CC□□0602□□	CCGX0602□□	CC□□0602□□	CC□□0602□□
	☐ SCFCR/L09S25	CC□□09T3□□	CC□□09T3□□	CC□□09T3□□	CC□□09T3□□	CCGX09T3□□	CC□□09T3□□	CC□□09T3□□
	☐ SCFCR/L12S25		CC□□1204□□	CC□□1204□□	CC□□1204□□	CCGX1204□□	CC□□1204□□	CC□□1204□□

Corresponding tool holders of insert **CC** ☐ ☐ S-type clamping**SCLCR/L****Kr:95°**

R-type shown



Type	Stock		Basic dimensions(mm)							Screw	Wrench	---	---
	R	L	Dmin	ød	L	s	a	b	e			---	---
S10M-SCLCR/L06S20	▲	▲	13	10	150	7	22	20	30	I60M2.5×5.5	WT07IP	---	---
S12P-SCLCR/L06S20	▲	▲	16	12	170	9	22	20	35			---	---
S16Q-SCLCR/L09S20	▲	▲	20	16	180	11	22	20	40	I60M3.5×8	WT15IP	---	---
S20R-SCLCR/L09S20	△	△	25	20	200	13	22	20	60			---	---

▲Stock available

△Make-to-order

Applicable inserts

Application	For extra finishing	For finishing	For semi-finishing	For roughing	For Al machining	For cast iron machining	PCBN/PCD inserts
Inserts shape	USF  A89	HF  A89	HM  A90	HR  A91	LH  A91-92	Without chipbreaker  A92	 A139
	SF  A89	EF  A90	EM  A90		LC  A91		 A144
Tool holder type	□□-SCLCR/L06S20	CC□□0602□□	CC□□0602□□	CC□□0602□□	CCGX0602□□	CC□□0602□□	CC□□0602□□
	□□-SCLCR/L09S20	CC□□09T3□□	CC□□09T3□□	CC□□09T3□□	CCGX09T3□□	CC□□09T3□□	CC□□09T3□□

General turning

Internal turning tools



Damping tool holders for internal turning

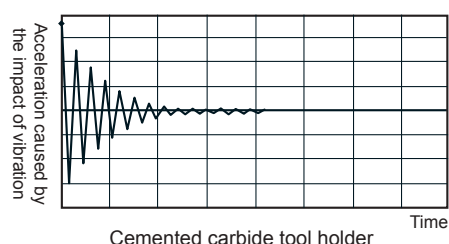
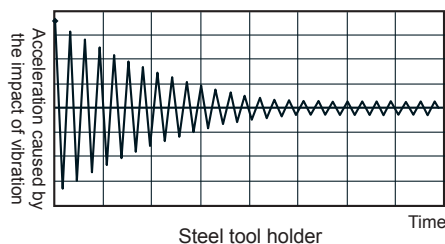
Technical features

Increasing material rigidity of tool holder can reduce the amplitude, or obtain larger overhang under the condition of same systemic stability. Therefore, compared with steel tool holder, cemented carbide tool holder has better dampening effect, smaller amplitude and reaches convergence point sooner. As for machining under the condition of long overhang and easy vibration, they can exert excellent performance and achieve higher dimensional accuracy and surface quality.



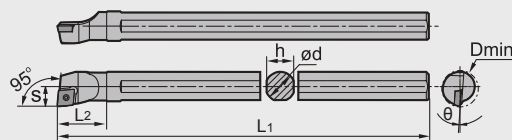
Under the same machining condition

the maximum overhang of cemented carbide tool holder can reach $L \leq 6D$, while the recommended maximum overhang of steel tool holder is $L \leq 3D$.



Corresponding tool holders of insert **CP** ☐ ☐ (Damping tool holder) S-type clamping**SCLPR/L****Kr:95°**

R-type shown



Type	Stock		Basic dimensions(mm)							Screw	Wrench	---	---
	R	L	Dmin	ød	s	L ₁	L ₂	h	θ			---	---
C10M-SCLPR/L06	▲	△	12	10	6	150	17	9	-7°	I60M2.5×5.5	WT07IP	--	--
C12Q-SCLPR/L06	△	△	16	12	8	180	20	11	-4°			--	--
C16R-SCLPR/L09	▲	△	20	16	10	200	29	15	-4°	I60M3.5×8	WT15IP	--	--
C20S-SCLPR/L09	△	△	25	20	13	250	35	18	-4°			--	--

▲Stock available

△Make-to-order

Applicable inserts

Application	For extra finishing	
Inserts shape	SF	
Tool holder type	☐ -SCLPR/L06	CP ☐ ☐ 0602 ☐ ☐
	☐ -SCLPR/L09	CP ☐ ☐ 09T3 ☐ ☐

A110

General
turning

Internal turning tools



TURNING / General Turning Tools

Internal turning tools

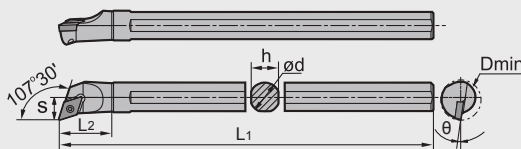
Corresponding tool holders of insert **DP** ☐ ☐ (Damping tool holder) S-type clamping

SDQPRIL

Kr:107° 30'



R-type shown



Type	Stock		Basic dimensions(mm)							Screw	Wrench	---	---
	R	L	Dmin	ød	s	L ₁	L ₂	h	θ			---	---
C10M-SDQPR/L07	▲	△	13	10	7	150	20	9	-8°	I60M2.5×5.5	WT07IP	---	---
C12Q-SDQPR/L07	△	△	16	12	9	180	22	11	-8°			---	---
C16R-SDQPR/L07	△	△	20	16	11	200	27	15	-6°			---	---
C16R-SDQPR/L11	△	△	20	16	11	200	32	15	-6°	I60M3.5×8	WT15IP	---	---
C20S-SDQPR/L11	▲	△	25	20	13	250	33	18	-6°			---	---

▲Stock available

△Make-to-order

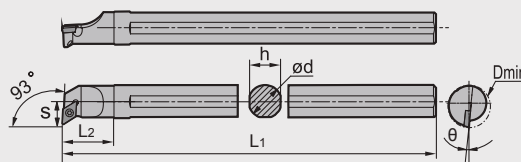
Applicable inserts

Application	For extra finishing	
Inserts shape	SF	
Tool holder type	☐ -SDQPR/L07	DP ☐ ☐ 0702 ☐ ☐
	☐ -SDQPR/L11	DP ☐ ☐ 11T3 ☐ ☐

A111

Corresponding tool holders of insert **DP** ☐ ☐ (Damping tool holder) S-type clamping**SDUPRIL****Kr:93°**

R-type shown



Type	Stock		Basic dimensions(mm)							Screw	Wrench	---	---
	R	L	Dmin	ød	s	L ₁	L ₂	h	θ			---	---
C10M-SDUPR/L07	△	△	15	10	9	150	18	9	-8°	I60M2.5×5.5	WT07IP	---	---
C12Q-SDUPR/L07	△	△	16	12	9	180	19	11	-8°	I60M2.5×6.5		---	---
C16R-SDUPR/L07	△	△	20	16	11	200	25	15	-6°			---	---

▲Stock available

△Make-to-order

Applicable inserts

Application	For extra finishing
Inserts shape	SF  A111
Tool holder type	☐ ☐ -SDUPR/L07 DP ☐ ☐ 0702 ☐ ☐

General turning

Internal turning tools



TURNING

General Turning Tools

Internal turning tools

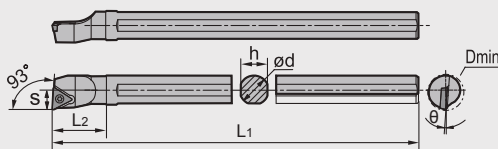
Corresponding tool holders of insert **TP** ☐ ☐ (Damping tool holder) S-type clamping

STUPRIL

Kr:93°



R-type shown



Type	Stock		Basic dimensions(mm)							Screw	Wrench	---	---
	R	L	Dmin	ød	s	L1	L2	h	θ			---	---
C10M-STUPR/L09	▲	△	12	10	6	150	20	9	-6°	I60M2.2×5.5	WT07IP	---	---
C12Q-STUPR/L09	▲	△	16	12	8	180	22	11	-4°			---	---
C12Q-STUPR/L11	▲	△	16	12	8	180	25	11	-4°	I60M2.5×6.5	WT07IP	---	---
C16R-STUPR/L11	▲	△	20	16	10	200	27	15	-3°			---	---

▲Stock available

△Make-to-order

Applicable inserts

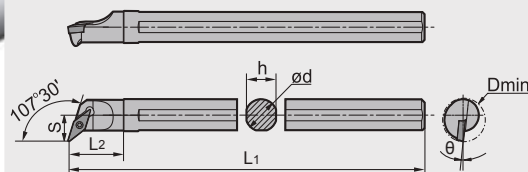
Application	For extra finishing	
Inserts shape	SF	
Tool holder type	☐ -STUPR/L09	TP ☐ ☐ 0902 ☐ ☐
	☐ -STUPR/L11	TP ☐ ☐ 1103 ☐ ☐

A113



Corresponding tool holders of insert **VC** ☐ ☐ (Damping tool holder) S-type clamping**SVQCR/L****Kr:107° 30'**

R-type shown



Type	Stock		Basic dimensions(mm)							Screw	Wrench	---	---
	R	L	Dmin	ød	s	L1	L2	h	θ			---	---
C16R-SVQCR/L11	△	△	22	16	13	200	28	15	-6°	I60M2.5×6.5	WT07IP	---	---
C20S-SVQCR/L11	△	△	26	20	15	250	32	18	-4°			---	---

▲Stock available

△Make-to-order

Applicable inserts

Application	For extra finishing		For finishing		For AI machining	
Inserts shape	USF	 A105	HF	 A105	LH	 A106
	SF	 A105			LC	 A106
Tool holder type	☐ ☐ -SVQCR/L11		VC ☐ ☐ 1103 ☐ ☐		VC ☐ ☐ 1103 ☐ ☐	
					VCGX1103 ☐ ☐	

General turning

Internal turning tools



TURNING / General Turning Tools

Internal turning tools

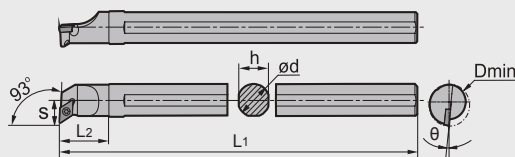
Corresponding tool holders of insert **VC** ☐ ☐ (Damping tool holder) S-type clamping

SVUCRIL

Kr:93°



R-type shown



Type	Stock		Basic dimensions(mm)							Screw	Wrench	---	---
	R	L	Dmin	ød	s	L1	L2	h	θ			---	---
C16R-SVUCR/L11	△	△	24	16	15	200	25	15	-6°	I60M2.5×6.5	WT07IP	---	---
C20S-SVUCR/L11	△	△	28	20	17	250	30	18	-4°			---	---

▲Stock available

△Make-to-order

Applicable inserts

Application	For extra finishing		For finishing	For AI machining	
Inserts shape	USF  A105	HF  A105	LH  A106		
	SF  A105		LC  A106		
☐ ☐ -SVUCR/L11	VC ☐ ☐ 1103 ☐ ☐		VC ☐ ☐ 1103 ☐ ☐	VCGX1103 ☐ ☐	



Table of recommended cutting parameters for general turning

ISO	Materials	Hardness HB	CVD Coating						PVD Coating			Cermet	Coated cermet	Cemented carbide		
			YBC151	YBC251	YBC152	YBC252	YBC351	YBC352	YBG102	YBG202	YBG302	YNG151	YNG151C	YC10	YC40	
			Feed rate (mm/rev)													
			0.1-0.6	0.1-0.8	0.1-0.6	0.1-0.8	0.2-1.0	0.2-1.0	0.2-0.4	0.1-0.6	0.05-0.8	0.05-0.2	0.05-0.2	0.1-0.4	0.1-0.5	
			Cutting speed (m/min)													
P	Carbon steel	C=0.15%	125	430-200	430-190	500-270	480-240	380-165	430-220	460-220	380-180	360-165	550-350	580-350	360-165	300-145
		C=0.35%	150	380-180	410-180	460-250	460-230	300-150	350-200	440-210	300-170	280-150	500-300	520-300	280-150	220-130
		C=0.60%	200	330-150	350-150	400-220	400-200	260-130	310-180	380-180	260-150	240-130	460-260	480-260	240-130	180-80
	Alloy steel	Anneal	180	350-170	350-150	400-180	400-200	200-100	250-150	380-180	200-120	180-100	410-240	430-240	180-100	160-80
		Hardened	275	230-100	210-100	280-150	260-140	140-70	200-120	240-120	140-90	120-70	300-180	320-180	120-70	120-50
		Hardened	300	210-100	190-70	260-150	240-120	125-60	180-110	220-100	125-80	100-60	250-170	270-170	100-60	80-40
		Hardened	350	180-80	170-70	230-120	220-120	110-55	160-100	200-100	110-75	90-55	230-150	250-150	90-55	70-45
	High alloy steel	Anneal	200	320-150	260-120	360-190	310-170	175-80	220-130	290-150	175-100	155-80	350-200	370-200	155-80	135-60
		Hardene	325	140-90	100-50	190-130	150-100	85-40	140-90	130-80	85-60	65-40	170-110	190-110	65-40	45-30
	Cast steel	Non-Alloy	180	240-120	200-100	280-160	250-140	135-75	190-130	230-125	135-95	115-75	260-170	280-170	115-75	95-55
		Low alloy	200	230-70	170-60	280-110	220-110	120-80	170-130	200-90	120-100	100-80	260-170	280-170	100-80	80-60
		High alloy	225	160-70	140-50	210-110	190-100	95-55	150-110	170-80	95-55	95-55	260-100	280-100	95-55	75-35

ISO	Materials	Hardness HB	CVD Coating				PVD Coating				Cermet	Coated cermet	
			YBM151	YBM153	YBM251	YBM253	YBM215	YBG202	YBG205	YBG302	YNG151	YNG151C	
			Feed rate (mm/rev)										
			0.2-0.6	0.2-0.6	0.2-0.6	0.2-0.6	0.2-0.4	0.1-0.4	0.2-0.4	0.2-0.6	0.1-0.3	0.1-0.3	
			Cutting speed (m/min)										
M	Stainless steel	Ferrite	180	280-180	280-180	250-140	260-140	290-190	300-190	290-190	250-150	330-220	350-210
	Austenite	260	250-150	250-150	200-110	210-110	240-160	250-160	240-160	220-120	250-150	270-140	
	Martensite	330	200-140	200-140	210-130	220-130	250-170	260-170	250-170	210-120	270-170	290-160	



TURNING

General Turning Tools

Application information of general turning

Recommended table of cutting parameters for general turning

ISO	Materials		Hardness HB	CVD Coating				Cermet	Coated cermet	Ceramics	Cemented carbide	
				YBD052	YBD102	YBD152	YBD252	YNG151	YNG151C	CN3100	YC10	YC40
				Feed rate (mm/rev)								
				0.1-0.4	0.1-0.4	0.1-0.5	0.1-0.8	0.1-0.4	0.1-0.4	0.1-1.5	0.1-0.3	0.1-0.4
				Cutting speed (m/min)								
K	Malleable cast iron	Ferrite	130	350-230	330-220	320-105	250-170	280-160	300-180	800-600	150-90	105-45
		Pearlite	230	250-105	230-100	230-100	180-75	220-120	240-150	700-500	120-70	80-30
	Low cast iron		180	520-200	480-200	480-190	380-150	400-250	420-270	700-500	170-100	130-60
	High cast iron		260	230-120	220-115	210-100	170-90	360-240	380-260	800-600	130-70	95-40
	Nodular cast iron	Ferrite	160	310-150	300-150	290-140	220-110	330-190	350-210	600-450	140-80	115-45
		Pearlite	250	230-110	220-105	210-100	170-90	310-200	330-220	500-350	110-70	80-30

ISO	Materials		Hardness HB	PVD Coating					Cemented carbide	Ceramics
				YBG102	YBG105	YBG202	YBS103	YBG212	YD101	CN3100
				Feed rate (mm/rev)						
				0.05-0.15	0.05-0.15	0.05-0.2	0.05-0.2	0.05-0.2	0.05-0.35	0.05-0.2
				Cutting speed (m/min)						
N	Al alloy	No heat treatment	60						1750-800	
		Heat treatment	100						510-250	
	Cast aluminum alloy	No heat treatment	75						460-175	
		Heat treatment	90						300-110	
	Copper alloy	Lead alloy	110						610-205	
		Copper, pure copper	90						310-195	
		Copper, nonlead Copper, electrolytic copper	100						225-115	
S	Ni-base alloy	Ni-base alloy	40	90-30	90-40	90-30	90-20	90-30	70-20	15-260

General turning

Application information of general turning



Recommended table of cutting parameters for general turning

ISO	Materials	PCBN											
		BK1011	BK1021	BK2511	BK2541	BH0121	BH1020	BH2011	BH2511	BH3511	BS1011	BS2011	BS3011
		Feed rate (mm/rev)											
		0.02-0.5		0.1-0.5		0.05-0.5				0.05-0.25			
		Cutting speed (m/min)											
K	Gray cast iron	400-1500		300-600									
	Hard cast iron	80-160		50-150									
S	Powder metallurgy and high temperature alloys									70-180	100-200	50-160	
H	Hardened steel					150-250	140-220	100-170	120-180	80-150			

General turning

Application information of general turning

ISO	Materials	PCD			
		DN0121	DN0511	DN1021	DN3021
		Feed rate (mm/rev)			
		0.05~0.4			
		Cutting speed (m/min)			
N	Silumin (si≤12%)	500~1000	900~3500	400~1200	300~700
	fibre reinforced composite materials	200~1000			
	Metal base compound		1500~1800		
	Copper and magnesium alloyssilumin		400~1260	400~1260	
	Cemented carbide		20~40		
	Unsintered ceramic materials				100~200
	Sintered Ceramic				20~50



TURNING General Turning Tools

Application information of general turning

Table of correctional cutting parameters of internal turning

Internal turning tools by P-type clamping

	Workpiece material	Hardness HB	Machining category	L/D≤3		L/D=3-4 (Diameter of shank ≥ Φ 16mm)	
				Feed rate (mm/rev)	Cutting depth (mm)	Feed rate (mm/rev)	Cutting depth (mm)
P	Carbon steel, Alloy steel 45#, 42CrMo	HB180—280	For semi-finishing	0.1- 0.25 -0.4	<5.0	0.1- 0.2 -0.3	<4.0
M	Stainless steel 1Cr18Ni9Ti 0Cr18Ni9	≤HB220	For semi-finishing	0.1- 0.2 -0.3	<4.0	0.1- 0.15 -0.25	<3.0
K	Cast iron HT250	HB170—230	For semi-finishing	0.1- 0.25 -0.4	<5.0	0.1- 0.2 -0.3	<4.0

Internal turning tools by S-type clamping

	Workpiece material	Hardness HB	Machining category	L/D≤3		L/D=4		L/D=5		L/D=6	
				Feed rate (mm/rev)	Cutting depth (mm)	Feed rate (mm/rev)	Cutting depth (mm)	Feed rate (mm/rev)	Cutting depth (mm)	Feed rate (mm/rev)	Cutting depth (mm)
P	Carbon steel, Alloy steel 45#, 42CrMo	HB180-280	For finishing	0.05- 0.1 -0.15	<0.2	0.05- 0.1 -0.15	<0.2				
			For semi-finishing	0.15- 0.25 -0.35	<3.0	0.1- 0.15 -0.2	<1.5				
M	Stainless steel 1Cr18Ni9Ti 0Cr18Ni9	≤HB220	For finishing	0.05- 0.1 -0.15	<0.2	0.05- 0.1 -0.15	<0.2				
			For semi-finishing	0.15- 0.2 -0.25	<2.0	0.1- 0.15 -0.2	<1.0				
N	Al alloy	---	For finishing	0.05- 0.1 -0.15	<0.2	0.05- 0.1 -0.15	<0.2	0.05- 0.1 -0.15	-0.15	0.05- 0.1 -0.15	<0.1
			For semi-finishing	0.05- 0.1 -0.15	<2.0	0.05- 0.1 -0.15	<1.5	0.05- 0.1 -0.15	-1.0	0.05- 0.1 -0.15	<1.0

Damping internal turning tools

	Workpiece material	Machining conditions	Chipbreaker	Inserts material	Feed rate (mm/rev)	Cutting depth (mm)
P	Steel HB180—280	For finishing	SF	YNG151 YNG151C	0.05- 0.2 -0.35	0.05- 0.1-0.3 -0.5
M	Stainless steel ≤HB220				0.05- 0.2 -0.35	0.05- 0.1-0.3 -0.5
K	Cast iron HB170—230				0.05- 0.2 -0.35	0.05- 0.1-0.3 -0.5

Blue words are recommended cutting parameters.

General turning

Application information of general turning



Frequent problems of turning and solutions

Common problem			Solutions		Tool material		Cutting conditions				Tool shape						Machine clamping system		
					Harder materials	Tougher materials	Cutting speed	Feed rate	Cutting depth	Cutting liquid	Change chipbreaker of inserts	Rake face	Nose radius	Approach angle	Cutting edge strength	Increase precision of inserts	Increase rigidity of tool holder	Clamping of tool holder and workpiece	Overhang of tool holder
Over abrasion on nose	Bad precision during machining	Abrasion intensified on flank	✓								↑								
		Unsuitable cutting conditions			↓	↑													
Surface precision deterioration	Bad surface quality	Abrasion intensified and cutting edge not sharp enough	✓		↓			✓		↑	↑		↓	✓					
		Cutting edge breakage		✓		↓	↓		✓		↑		↑			✓	✓	✓	
		Unsuitable geometrical shape of cutting edge							✓		↑		↓	✓					
		Unsuitable cutting conditions			↑	↓	↓	✓											
		Vibration		✓	↑	↓	↓	✓	✓	↑	↓	↑	↓		✓	✓	✓	✓	
		Built-up edge			↑	↑		✓	✓	↑			↓	✓					
Radiation	Effect of cutting heat	Unsuitable cutting conditions			↓	↓	↓												
		Unsuitable geometrical shape of cutting edge	✓						✓	↑			↓						
Bad precision of dimensions	Dimensions fluctuate during cutting	Insert tolerance											✓						
		Offset of workpiece or tools							✓	↑	↓	↑			✓	✓	✓	✓	
Breakage	Abrasion on flank and rake face	Abrasion on clearance face	✓		↓				✓	↑	↑		↓						
		Abrasion on rake face	✓		↓	↓	↓		✓	↑		↓							
	Edge chipping		✓		↓	↓		✓			↓	↑		✓	✓	✓	✓		
	Built-up edge	Unsuitable workpiece hardness for cutting conditions			↑	↑		✓	✓	↑		↓	✓						
	Thermal cracking	Hardness of workpiece material and tool material unsuitable for cutting conditions			↓	↓	↓	✓	✓	↑		↓							
	Cutting edge nose deformation	Occurring during intermittent machining with high feed rate	✓		↑	↓	↓	✓	✓	↑	↑	↓	↓						
	Tool life	Unsuitable materials and cutting conditions		✓		↓	↓		✓		↑	↓	↑		✓	✓	✓	✓	
Chip controlling	Long, unbroken and snarled chips	Unsuitable cutting condition			↓	↑	↑	✓											
		Unsuitable geometry							✓		↓	↑							
	Too short and hard chips	Unsuitable cutting condition				↓	↓	✓											
		Unsuitable geometrical shape of cutting edge							✓		↑	↓							
Burr and knockdown flange	Steel and Al, burrs occurring	Unsuitable cutting condition			↑	↓		✓											
		Tool abrasion and unsuitable geometrical shape	✓						✓	↑	↓	↑	↓						
	Edge break out on cast iron	Unsuitable cutting conditions			↓	↑		✓											
		Tool abrasion and unsuitable geometrical shape	✓						✓	✓	↓	↓	↓						
	Heavy burr on soft steel	Unsuitable cutting condition				↓	↓												
		Tool abrasion and unsuitable geometrical shape	✓						✓	↑	↑		↑		✓	✓	✓	✓	



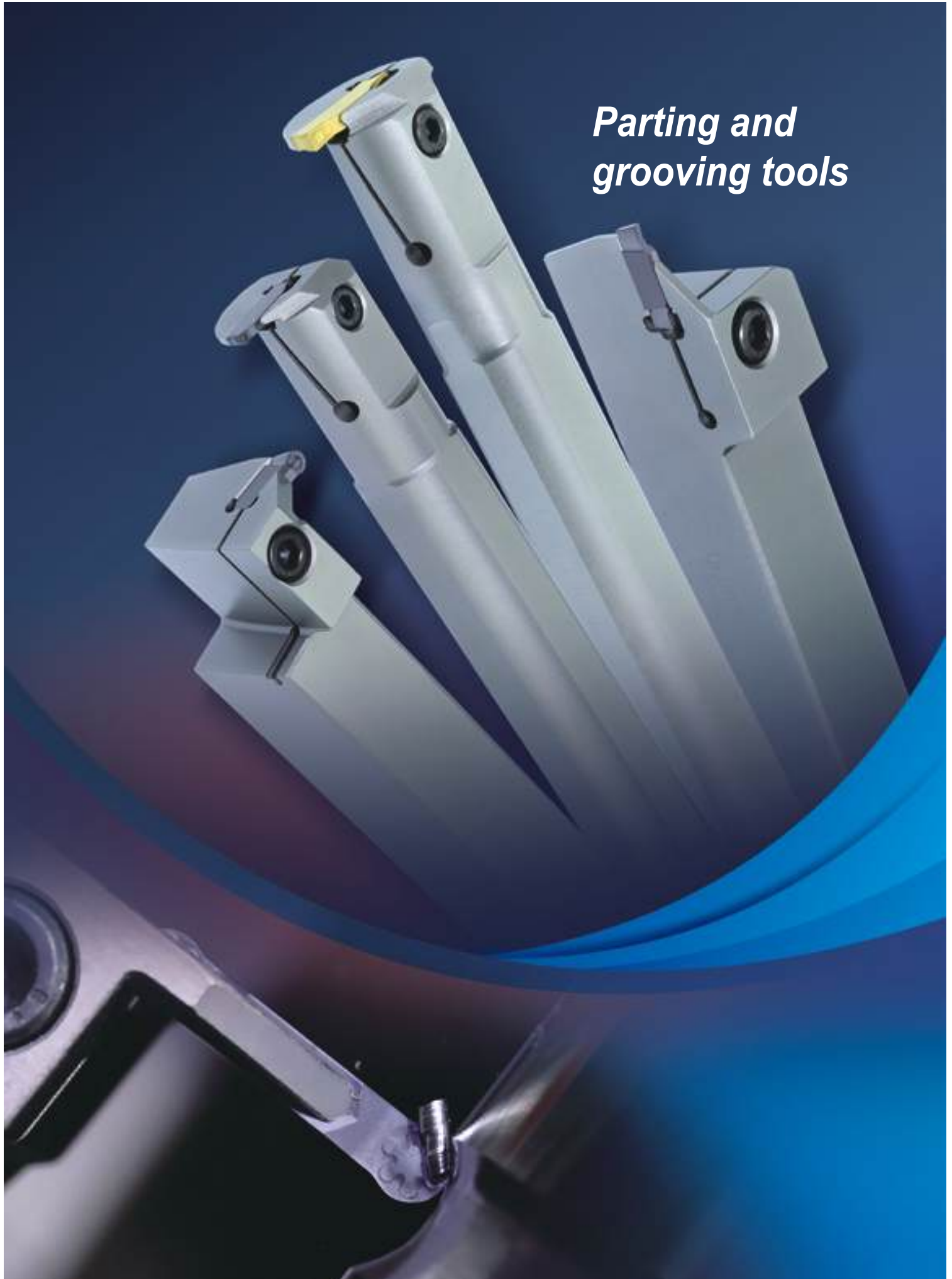
TURNING / General Turning Tools

Application information of general turning

Abrasion of tools and various damages

Tool damage type	Phenomenon	Cause	Solution
Flank wear	Cutting resistant force increasing Groove wear on flank	Tool material is too soft. Cutting speed is too high. Clearance angle is too small. Feed rate is too low.	◆Select tool materials with good wear resistance. ◆Reduce cutting speed. ◆Enlarge clearance angle. ◆Increase feed rate.
Rake face wear (Crater wear)	Bad chip controlling Surface quality deterioration	Tool material is too soft. Cutting speed is too high. Feed rate is too high.	◆Select tool materials with good wear resistance. ◆Reduce cutting speed. ◆Reduce feed rate.
Cutting edge breakage	Occasional breakage Instability of tool life	Tool material is too hard. Feed rate is high. Cutting edge strength is not high enough. Rigidity of tool holder and tool bar is small.	◆Select tool materials with good toughness. ◆Reduce feed rate. ◆Increase land width (if rounding changes into chamfering). ◆Enlarge tool bar size.
Breakage	Cutting resistant force increasing Deterioration of surface roughness	Tool material is too hard. Feed rate is high. Cutting edge strength is not high enough. Rigidity of tool holder and tool bar is low.	◆Select tool materials with good toughness. ◆Reduce feed rate. ◆Increase land width (if rounding changes into chamfering). ◆Enlarge tool bar size.
Plastic deformation (Cutting edge collapse)	Workpiece dimensions change Nose abrasion	Tool material is too soft. Cutting speed is too high. Cutting depth and feed rate are too high. Cutting edge temperature is too high.	◆Select tool material with good wear resistance ◆Reduce cutting speed. ◆Reduce cutting depth and feed rate. ◆Select tool materials with good heat conductivity.
Built-up edge (Bonding)	Surface quality deterioration during finishing Cutting resistant force increasing	Cutting speed is low. Cutting edge is not sharp enough. Tool material is unsuitable.	◆Increase cutting speed. ◆Enlarge rake angle. ◆Select tool materials that are not easy to adhere together (coating, cermet, etc.)
Thermal cracking	Damage because of thermal circulation Normally occurring during intermittent machining	Premature edge failure due to thermal cracks. Tool material is too hard.	◆Adopt dry cutting. ◆Select tool materials with good toughness.
Chattering	burrs occurring Cutting resistant force increasing	Feed rate and cutting speed are too high.	◆Select tool materials with good wear resistance. ◆Sharpen cutting edge by enlarging rake angle. ◆Reduce cutting speed.
Flaking	Usually occurring when machining super hard materials, which is accompanied with vibration	Bonding occurs on cutting edge. Chip flow is obstructed.	◆Sharpen cutting edge by enlarging rake angle. ◆Enlarge chip pocket.

*Parting and
grooving tools*





TURNING Parting and grooving tools

How to select parting and grooving tools

How to select parting and grooving tools

Structure of parting and grooving tools selection table

- Categorized as external machining, internal machining and profile machining.
- Concluded and separately listed according to product series (Little squirrel series and Supplementary series).

Dimensions

Application of external machining, internal machining and profile machining

External parting, grooving and turning tools

R-type shown

Type	Stock	Basic dimensions(mm)							Applicable inserts	Screw	Wrench	
		R	L	H	B	L	S	W				
QEAD	1212R/L07	▲	▲	12	12	125	11.4	1.5	7	ZCAD0150□	GB70-85-M4×12	WH30L
	1212R/L12	▲	▲	12	12	125	11.4	1.5	12	ZCAD0150□		
	1616R/L07	▲	▲	16	16	125	15.4	1.5	7	ZCAD0150□		
	1616R/L12	▲	▲	16	16	125	15.4	1.5	12	ZCAD0150□		
	2020R/L07	▲	▲	20	20	125	19.4	1.5	7	ZCAD0150□		
QEAD	2020R/L12	▲	▲	20	20	125	19.4	1.5	12	ZCAD0150□	GB70-85-M5×16	WH40L
	1212R/L07	▲	▲	12	12	125	11.2	2	7	ZCB0020□		
	1212R/L10	▲	▲	12	12	125	11.2	2	10	ZCB0020□		
	1212R/L14	▲	▲	12	12	125	11.2	2	14	ZCB0020□		
	1616R/L07	▲	▲	16	16	125	15.2	2	7	ZCB0020□		
QEAD	1616R/L10	▲	▲	16	16	125	15.2	2	10	ZCB0020□	GB70-85-M5×16	WH40L
	1616R/L14	▲	▲	16	16	125	15.2	2	14	ZCB0020□		
	2020R/L07	▲	▲	20	20	125	19.2	2	7	ZCB0020□		
	2020R/L10	▲	▲	20	20	125	19.2	2	10	ZCB0020□		
	2020R/L14	▲	▲	20	20	125	19.2	2	14	ZCB0020□		
QEAD	2525R/L07	▲	▲	25	25	150	24.2	2	7	ZCB0020□	GB70-85-M6×20	WH50L
	2525R/L10	▲	▲	25	25	150	24.2	2	10	ZCB0020□		
	2525R/L14	▲	▲	25	25	150	24.2	2	14	ZCB0020□		
	1616R/L10	▲	▲	16	16	125	15	2.5	10	ZCB0020□		
	1616R/L17	▲	▲	16	16	125	15	2.5	17	ZCB0020□		
QEAD	2020R/L10	▲	▲	20	20	125	19	2.5	10	ZCB0020□	GB70-85-M6×20	WH50L
	2020R/L17	▲	▲	20	20	125	19	2.5	17	ZCB0020□		
	2525R/L10	▲	▲	25	25	150	24	2.5	10	ZCB0020□		
	2525R/L17	▲	▲	25	25	150	24	2.5	17	ZCB0020□		
	1616R/L10	▲	▲	16	16	125	14.8	3	10	ZCF0030□		
QEAD	1616R/L17	▲	▲	16	16	125	14.8	3	17	ZCF0030□	GB70-85-M5×20	WH40L
	2020R/L10	▲	▲	20	20	125	18.8	3	10	ZCF0030□		
	2020R/L17	▲	▲	20	20	125	18.8	3	17	ZCF0030□		
	2525R/L10	▲	▲	25	25	150	23.8	3	10	ZCF0030□		
	2525R/L17	▲	▲	25	25	150	23.8	3	17	ZCF0030□		
QEAD	2020R/L13	▲	▲	20	20	140	18.5	4	13	ZCG0040□	GB70-85-M6×20	WH50L
	2020R/L22	▲	▲	20	20	140	18.5	4	22	ZCG0040□		
	2525R/L13	▲	▲	25	25	150	23.5	4	13	ZCG0040□		
	2525R/L19	▲	▲	25	25	150	23.5	4	19	ZCG0040□		

▲ Stock available △ Make-to-order

Internal grooving and turning tools

R-type shown

Type	Stock		Basic dimensions(mm)							Applicable inserts	Screw	Wrench
	R	L	ad	L	S	W	ar max	ØDmin				
C20Q-QEAD/L05-27	▲	▲	20	180	15.2	2.5	5	27	ZTED025□	ZRED025□	GB70-85-M4×12	WH30L
C25R-QEAD/L07-33	▲	▲	25	200	20.3	2.5	7	33	ZTED025□			
C32S-QEAD/L09-42	▲	▲	32	250	25.3	2.5	9	42	ZTF0030□	ZRF0030□	GB70-85-M5×20	WH40L
C20Q-QFDR/L05-27	▲	▲	20	180	15.2	3	5	27	ZTF0030□			
C25R-QFDR/L07-33	▲	▲	25	200	20.3	3	7	33	ZTF0030□	ZRF0030□	GB70-85-M5×16	WH40L
C32S-QFDR/L09-42	▲	▲	32	250	25.3	3	9	42	ZRF0030□			
C25R-QQDR/L08-35	▲	▲	25	200	21.5	4	8	35	ZTG0040□	ZRG0040□	GB70-85-M5×16	WH40L
C32S-QQDR/L11-44	▲	▲	32	250	27.5	4	11	44	ZTG0040□			
C40T-QQDR/L13-54	▲	▲	40	300	33.5	4	13	54	ZTG0040□	ZTH0050□	GB70-85-M6×20	WH50L
C25R-QHDR/L08-35	▲	▲	25	200	21.5	5	8	35	ZTH0050□			
C32S-QHDR/L11-44	▲	▲	32	250	27.5	5	11	44	ZTH0050□	ZRH0050□	GB70-85-M6×20	WH50L
C40T-QHDR/L13-54	▲	▲	40	300	33.5	5	13	54	ZRH0050□			
C25R-QKDR/L08-35	▲	▲	25	200	21.5	6	8	35	ZTK0060□	ZRK0060□	GB70-85-M6×16	WH40L
C32S-QKDR/L11-44	▲	▲	32	250	27.5	6	11	44	ZTK0060□			
C40T-QKDR/L13-54	▲	▲	40	300	33.5	6	13	54	ZTK0060□	ZRK0060□	GB70-85-M6×20	WH50L
C40T-QKDR/L13-54	▲	▲	40	300	33.5	6	13	54	ZRK0060□			

▲ Stock available

△ Make-to-order

Profile turning tools for AI

R-type shown

Type	Stock		Basic dimensions(mm)						Applicable inserts	Screw	Wrench
	R	L	ØD (Minimum machining diameter)	ad	S	L1	L2				
C40X-QLDR/L65-15A	▲	▲	160	40	21	320	65	ZRLD08-LH	GB70-85-M6×20	WH50L	
C40X-QLDR/L80-15A	▲	△	160	40	21	320	80	ZRLD08-LH			
C40X-QKDR/L60-15A	▲	△	160	40	20	320	60	ZRKD06-LH			
C40X-QKDR/L75-15A	▲	△	160	40	20	320	75	ZRKD06-LH			

▲ Stock available △ Make-to-order

Specification of products
Including type, basic dimensions, applicable inserts and accessories.

Indicating the minimum machining diameter
The minimum machining diameter is very important for internal machining.



TURNING



Parting and grooving tools >>>



Parting and grooving tools overview • A250-A252

Parting and grooving inserts • A253-A269

Introduction of Little Squirrel series inserts chipbreaker • A254-A257

Parting, grooving and profiling inserts code key • A258

Inserts of Little Squirrel series • A259-A265

QC series shallow grooving inserts code key • A266

QC series shallow grooving inserts • A267-A268

Inserts of ZQMX series • A269

Parting and grooving tools • A270-A288

Little squirrel series •

Little squirrel series parting and grooving tools code key • A270-A271

External parting, grooving and turning tools • A272-A273

Precise grooving and turning tools • A274

External recess and profiling tools • A274

External grooving tools for materials hard to be machined • A275

External parting inserts and holder for external parting • A275

Surface grooving and turning tools • A276-A283

Internal grooving and turning tools • A284

Profile turning tools for Al • A284

QC series shallow grooving tools •

QC series shallow grooving tools code key • A285

External shallow grooving tools • A286

Internal shallow grooving tools • A286

Supplementary series •

Supplementary series parting and grooving tools code key • A287

QZQ external grooving series • A288

Application information on parting and grooving • A289-A290



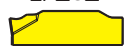
TURNING Parting and grooving tools

Parting and grooving tools overview

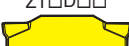
General turning

Parting and grooving

Parting and grooving tools overview

Machining application	Machining type	Applicable tools	Corresponding inserts	Tool features and parameters
External machining	Parting	Little squirrel series QZ□□+QE□□  A275	Parting inserts ZP□S□□ 	- Assemble structure of parting blade and holder; good rigidity; adjustable parting range. - The maximum parting diameter is 120mm.
		Little squirrel series QE□□R/L  A272-A273	ZP□D□□  ZP□S□□ 	- Inserts have three-dimensional chipbreaker with low cutting force and good performance on chip-breaking. - The maximum parting diameter is 60mm.
		Supplementary series QZQ□□R/L  A288	ZQMX□□ 	- Cutting edge strength is suitable for bad machining conditions. - The maximum parting diameter is 70mm.
	Grooving and turning	 Little squirrel series QE□□R/L  A272-A273	Double cutting edges for parting ZT□D□□□□  Profile turning ZR□D□□□□  Single cutting edge for deep grooving ZT□S□□□□ 	- A single tool with multiple applications such as grooving, parting and profile turning, reducing tools categories needed. - A multifunctional tool when used with grooving inserts. Suitable for profile machining. - The maximum slot depth machinable is 30mm.
	Precise grooving	 Little squirrel series QECD  A273	Precise grooving ZT□D□□□□-EG  Edge width 1.2~2.4mm	- Grinded insert used for precise grooving - Edge width can be anything between 1.0-6.5mm, customized according to users' needs. - ZT□□□□□□-EG inserts:
		Little squirrel series QE□□R/L  A272-A273	Precise grooving ZT□D□□□□-EG  Edge width 2.4~6.5mm	When edge width is between 1.2-2.4mm, the maximum cutting depth is 2.5mm. When edge width is above 2.4-6.5mm, the maximum cutting depth is 22mm.



Machining application	Machining type	Applicable tools	Corresponding inserts	Tool features and parameters
External machining	Shallow grooving	QC series GQCR/L  A286	QC16/22□□□□ 	- Fine grinding of blades with high precision. - Sharp edges and high machining accuracy. - Three finely ground cutting edges for good economy. - For cutting shallow grooves, groove width 0.5-4.8mm. - Maximum depth of cut 4mm.
	Grooving and turning	Little squirrel series C□□-Q□□R/L□  A284	Grooving, Turning ZT□□□□  Profile turning ZR□□□□ 	- By using inserts for grooving and profiling, one tool can be versatile, reducing the tool categories needed. - The maximum slot depth machinable is 13mm. - The minimum machining diameter is 27mm.
Internal machining	Shallow grooving	QC series S□□□-QC□□R/L□  A286	QC11/16/22□□□□ 	- Fine grinding of blades with high precision. - Machining groove width 0.5-4.8mm. - Minimum machining diameter 16mm. - Maximum depth of cut 4mm.
	Grooving and turning	Little squirrel series QF□□□□H  A278-A281 Little squirrel series QF□□□□L  A282-A283	Grooving, Turning ZT□□□□  Profile turning ZR□□□□  Grooving, Turning ZT□□□□  Profile turning ZR□□□□ 	- By using inserts for grooving and profiling, one tool can be versatile, reducing the tool categories needed. - Grooving diameter is 48-400mm. - Grooving depth is 10-30mm. 90°holder, top clamping. - By using inserts for grooving and profiling, one tool can be versatile, reducing the tool categories needed. - Grooving diameter is 48~400mm. - Grooving depth is 10~30mm.
Recess machining	Recess machining	Little squirrel series QX□□□□□□  A274	Grooving, Turning ZT□□□□  Profile turning ZR□□□□ 	- The unique tool for recess machining. - Complete range of specifications, able to achieve various recess machining.

General turning

Parting and grooving

Parting and grooving tools overview



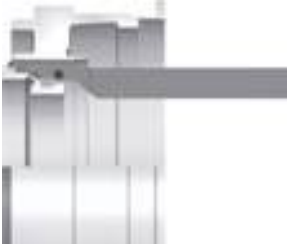
TURNING / Parting and grooving tools

Parting and grooving tools overview

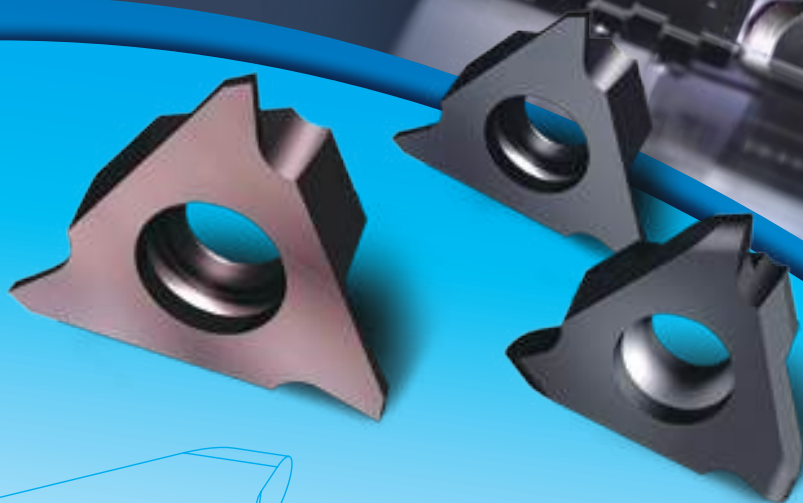
General
turning

Parting and
grooving

Parting and grooving tools overview

Machining application	Machining type	Applicable tools	Corresponding inserts	Tool features and parameters
Al profiling	External machining	 Little squirrel series QE□□R/L  A272-A273	Little squirrel series ZR□□-LH	- The unique tool for profiling of Al material. - Cutting edge is designed to combine sharpness and strength, suitable for continuous and intermittent turning. - Used for external, surface and inner wall machining of Al wheel hub.
	Inner wall and surface machining	 Little squirrel series C40X□□  A284		
Tools for aviation and aerospace industries	External machining	 Little squirrel series QE□S□□N  A274	Little squirrel series ZIGQ□□  Little squirrel series ZIMF□□ 	- V-type locating, top clamping, precise locating, safe clamping. - Normal square-ended inserts and precise square-ended inserts are suitable for adhesive. materials hard to machine such as Ni-base high-temperature alloy, Ti alloy and stainless steel, etc.
	Non-standard Tools	 Non-standard tools to match workpiece	Select and manufacture as required	Tailor made solutions for machining various parts to satisfy your requirements.

Little squirrel series



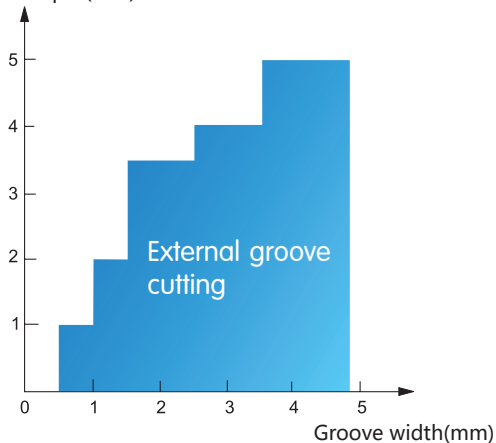
QC series shallow grooving tools

**Machine industry shallow
groove processing tool**

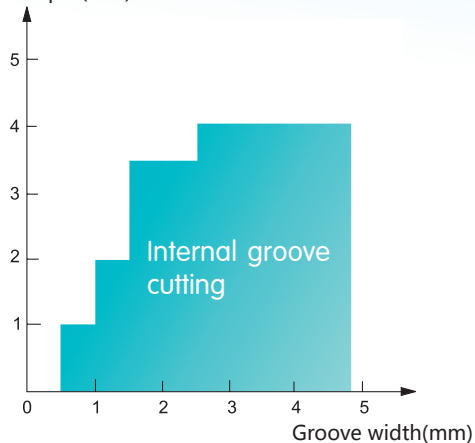
Widely used for shallow groove machining
of shaft and ring parts in machinery industry

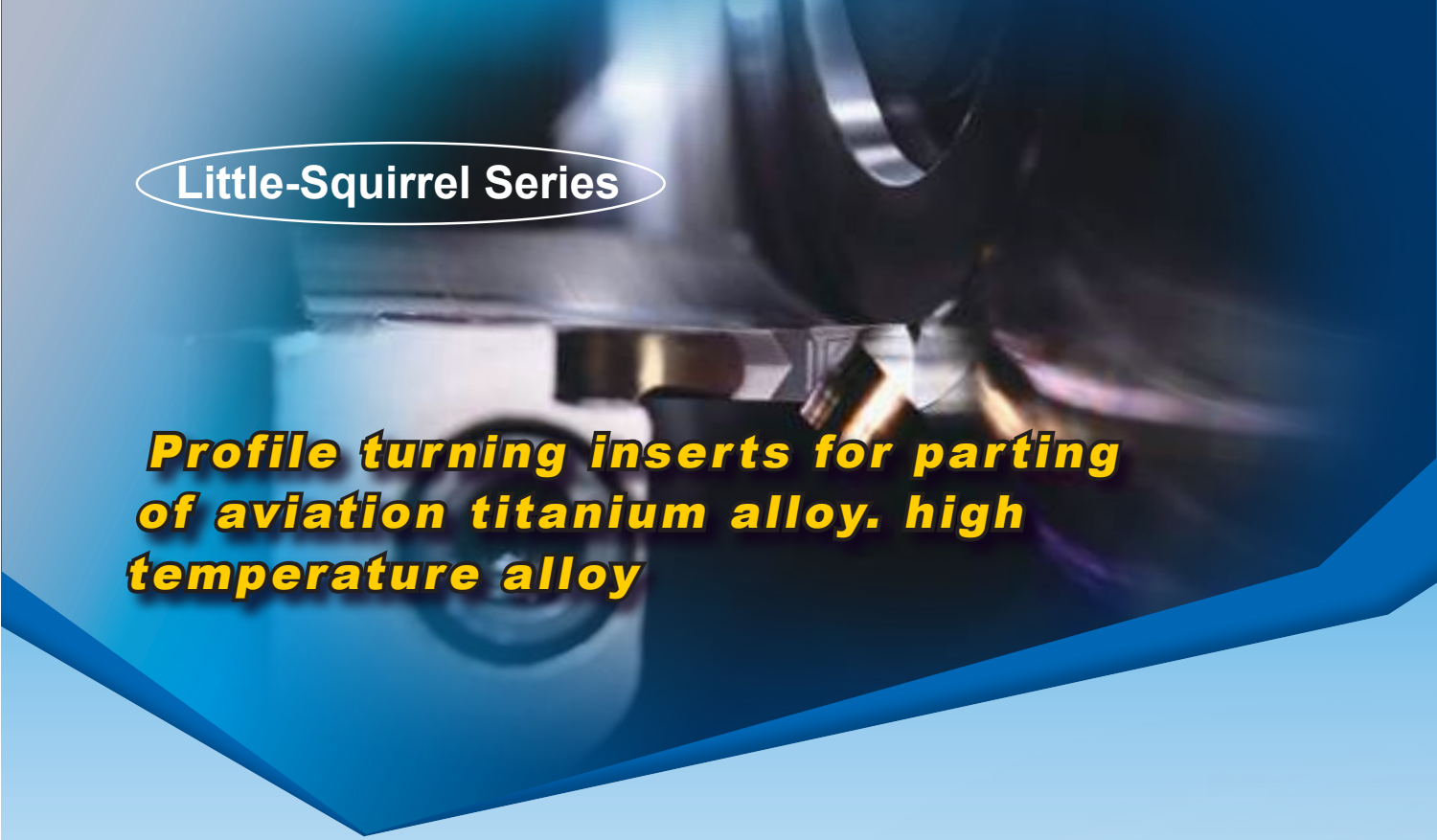
Shallow groove series tool grooving range

Groove depth(mm)



Groove depth(mm)





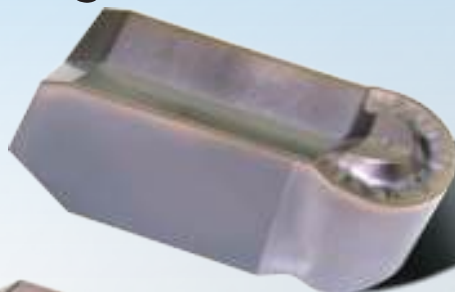
Little-Squirrel Series

Profile turning inserts for parting of aviation titanium alloy. high temperature alloy

-NF

Single-headed precision profile turning inserts

Sharp edge, small cutting force, good surface quality;
Indexing accuracy reaches $\pm 0.025\text{mm}$, safe and stable clamping;
Mainly applied in finishing of high-temperature alloy, titanium alloy.



-NM

Precision profile turning inserts

Sharp edge, small cutting force, good surface quality;
Indexing accuracy reaches $\pm 0.025\text{mm}$;
Highly economical, two edges available;
Compatible with little squirrel tool holder, suitable for small depth profile finishing and semi-finishing of high-temperature alloy and Ti-alloy.



-SM

Single-headed groove turning inserts

Straight edge, excellent surface quality;
Sharp edge, smaller cutting force;
Good chip breaking;
Mainly used for rough machining of high-temperature alloy and titanium alloy.



-MM

Straight edge groove turning inserts

High edge strength, sharp edge;
Highly economical, two edges available, compatible with little squirrel tool holder;
With special grades, suitable for roughing with small cutting depths of high-temperature alloy and titanium alloy.



Case

Insert: YBG105/ZIMF604N-SM
Hardness of workpiece material: GH4169 (HB380)
Cutting data: $V_c=45\text{m/min}$, $f=0.2\text{mm/r}$
Coolant: Water



Products of company A



YBG105/ZIMF604N-SM

Conclusion: Under the same conditions, chip breaking performance is better and the time for stopping the removal of long winding chips is reduced.

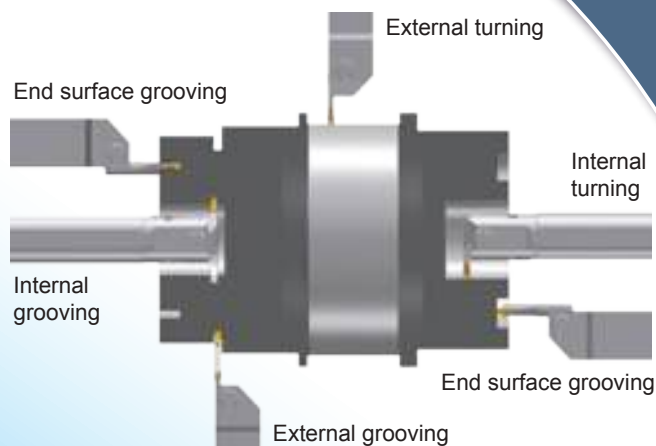
-MG Chipbreaker

Customized -MG chipbreaker series

Suitable for parting ,grooving, profile turning and turning, etc. Easy machining and unobstructed chip flow lead to improved surface quality.

Human-centered design realizes various application of one single insert, reducing number of tools needed

Inserts of the same edge with can work with corresponding tool holders to satisfy the requirements of external, internal and surface grooving and turning by using minimum numbers of inserts and tool holders, effectively reducing cost of tool storage and management.



The cutting force is reduced by 20%, and the vibration is diminished.

Unique and professional structure design of parting inserts

- A special flank structure is designed to reduce cutting resistant force by 20% and diminish vibration, which improves the surface quality.
- A special edge design requires less rigidity of machine. It can be used on low power machines.



Little squirrel series



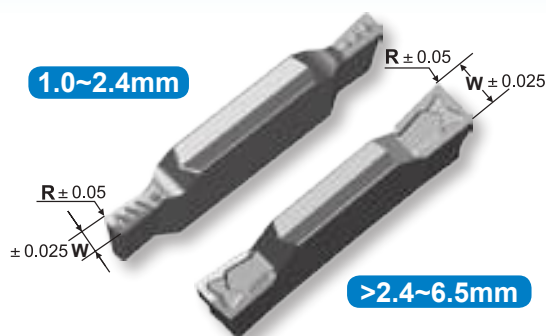
Precision grooving and profile turning inserts

Special chipbreaker design, suitable for precise grooving of low-carbon steel, stainless steel, adhesive materials and non-ferrous metal.

The tolerance of the edge width S of precise grooving and profiling inserts can reach ± 0.025 . Inserts can also be mounted on the corresponding specifications of original tool series.

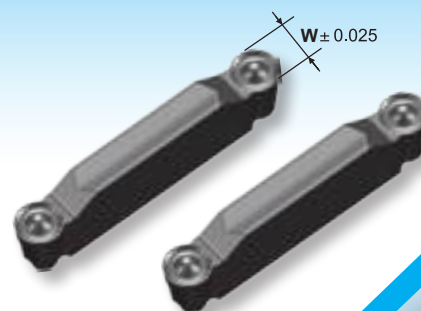
-EG Precision grooving inserts

The edge width can be anything between **1.0-6.5MM** according to your requirements.



The width of the Little Squirrel series precise grooving inserts can be anything between 1.0mm to 6.5mm, which means products with any edge width or nose radius can be provided according to customers' requirements. The inserts are mainly used for precise grooving, such as sealing slot and locating slot, etc.

-EG Precision profile turning inserts

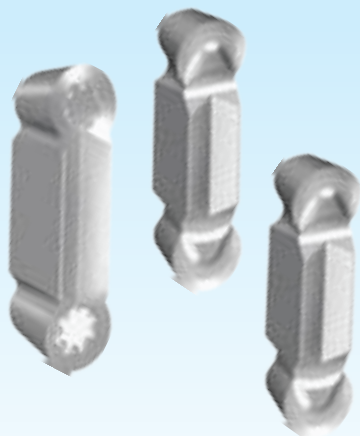


The Little Squirrel series precise profiling and turning inserts are mainly used for Precise grooving and profiling.

-LC/-LH

Profile turning inserts for Al

The special chipbreaker for aluminum profiling is designed to combine sharpness and strength of the cutting edge, effectively reducing the friction between chips and the rake face. The inserts are suitable for continuous and intermittent profiling of Al alloy.



Suitable for various machining of Al wheel boss periphery, surface and inner wall, etc.



TURNING Parting and grooving tools

Little squirrel series parting and grooving inserts

Little squirrel series parting, grooving and profiling inserts code key

General
turning

Parting and
grooving

Little squirrel series parting
and grooving inserts

Insert applications

ZP > Parting **ZT** > Grooving and turning
ZR > Profiling

Code of locating slot

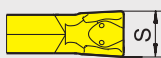
Code of locating slot	A	B	E	F	G	H	K	L
Corresponding edge width of inserts	1.5	2.0	2.5	3.0	4.0	5.0	6.0	8.0

Code of cutting edge number

S > Single cutting edge **D** > Double cutting edge

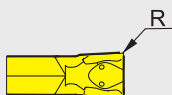
ZP G D 04 04 - M G

Cutting edge width



015=1.5mm
02=2.0mm
025=2.5mm
03=3.0mm
04=4.0mm
05=5.0mm
06=6.0mm
08=8.0mm

Nose radius



02=0.2mm
03=0.3mm
04=0.4mm
08=0.8mm

Tolerance class

M > M-level tolerance
E > E-level tolerance

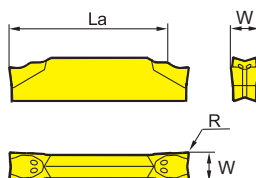
Chipbreaker code

G > Curve edges universal chipbreaker,
suitable for machining various materials
M > linear edges universal chipbreaker,
suitable for machining various materials
F > Special chipbreaker

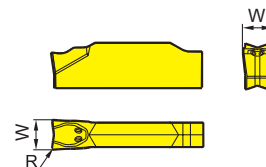
Parting inserts



Double edges



Single edge



Type		Basic dimensions(mm)			Grade				
					CVD Coating		PVD Coating		Cemented carbide
		$W^{+0.1}_0$	$R_{\pm 0.1}$	Cutting depth La_{max}	YBC151	YBC251	YBG205	YBG302	YD101
Double edges	ZPAD01502-MG	1.5	0.2	12		○	★	○	
	ZPBD0202-MG	2.0	0.2	14		○	★	○	
	ZPED02502-MG	2.5	0.2	17		○	★	★	
	ZPFD0302-MG	3.0	0.2	17		○	★	○	
	ZPGD0402-MG	4.0	0.2	22		○	★	○	
	ZPHD0503-MG	5.0	0.3	22		○	★	○	
	ZPKD0604-MG	6.0	0.4	22		○	★	○	
Single edge	ZPES02502-MG	2.5	0.2			○	★	★	
	ZPFS0302-MG	3.0	0.2			○	★	○	
	ZPGS0402-MG	4.0	0.2			○	★	○	
	ZPHS0503-MG	5.0	0.3			○	★	○	
	ZPKS0604-MG	6.0	0.4			○	★	○	

Single edge tool for cutter plate only

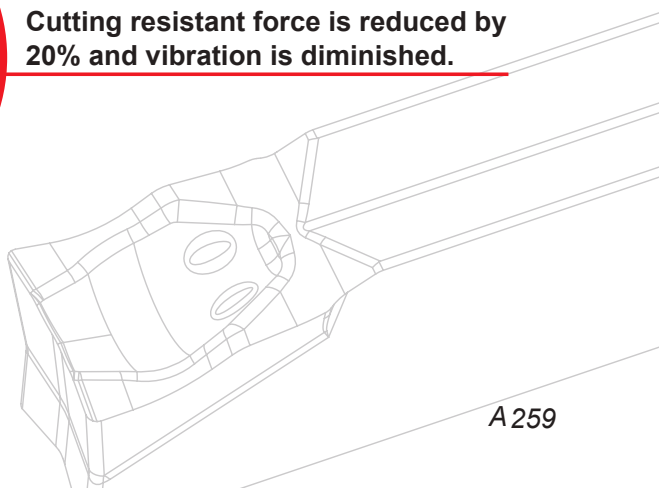
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order



Please reduce the cutting speed by 30% when the insert is approaching the centre of workpiece. This can prolong tool life.

Optimal chipbreaker structure can control chip flow and curling well.

Cutting resistant force is reduced by 20% and vibration is diminished.





TURNING Parting and grooving tools

Little squirrel series parting and grooving inserts

Grooving and turning inserts

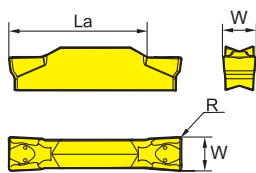
General
turning

Parting and
grooving

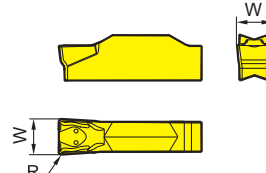
Little squirrel series parting
and grooving inserts



Double edges

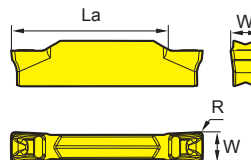


Single edge



Type		Basic dimensions(mm)			Grade					
					CVD Coating		PVD Coating			Cemented carbide
		$W^{+0.1}_0$	$R \pm 0.10$	Cutting depth L_{max}	YBC151	YBC251	YBG202	YBG205	YBG302	YD101
Double edges	ZTED02503-MG	2.5	0.3	17	○	○	●	★	★	
	ZTFD0303-MG	3.0	0.3	17	○	○	●	★	★	
	ZTGD0404-MG	4.0	0.4	22	●	○	●	★	★	
	ZTHD0504-MG	5.0	0.4	22		○	●	★	★	
	ZTKD0608-MG	6.0	0.8	22		○	●	★	★	
Single edge	ZTHS0504-MG	5.0	0.4			○	○	★	○	
	ZTKS0608-MG	6.0	0.8			○	○	★	○	

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



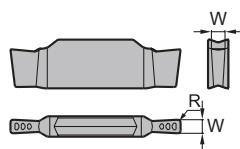
Type		Basic dimensions(mm)			Grade					
					CVD Coating		PVD Coating			Cemented carbide
		W	$R \pm 0.1$	Cutting depth L_{max}	YBC151	YBC251	YBG202	YBG205	YBG302	YD101
Double edges	ZTAD01502-MM	1.5±0.03	0.2	12	○	○	●	★	○	
	ZTBD02002-MM	2.0±0.03	0.2	14	○	○	●	★	○	
	ZTED02503-MM	2.5±0.03	0.3	17	○	○	●	★	○	
	ZTFD0303-MM	3.0±0.03	0.3	17	○	○	●	★	○	
	ZTGD0404-MM	4.0±0.04	0.4	22	○	○	●	★	○	
	ZTHD0504-MM	5.0±0.04	0.4	22	○	○	●	★	○	
	ZTKD0608-MM	6.0±0.04	0.8	22	○	○	●	★	○	
	ZTLD0808-MM	8.0±0.05	0.8	28	○	○	●	★	○	

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

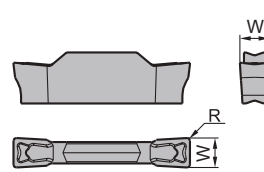
Precise grooving and turning inserts



1.0~2.4mm series



>2.4~6.5mm series



Type		Basic dimensions(mm)			Grade					
					CVD Coating		PVD Coating			Cemented carbide
		$W \pm 0.025$	$R^{(2)} \pm 0.05$	Cutting depth $L_{\max}$	YBC151	YBC251	YBG202	YBG205	YBG302	YD101
Double edges	ZTCD□□□□□-EG ⁽¹⁾	1.0~1.6	See note. (2)	2.6	○	○	○	★	○	
		1.6~2.4		3.4						
	ZTED□□□□□-EG	2.4~3.0		17	○	○	○	★	○	
	ZTFD□□□□□-EG	3.0~3.8		17	○	○	○	★	○	
	ZTGD□□□□□-EG	3.8~4.8		22	○	○	○	★	○	
	ZTHD□□□□□-EG	4.8~5.8		22	○	○	○	★	○	
	ZTKD□□□□□-EG	5.8~6.5		22	○	○	○	★	○	

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

Note: (1) □ The code here in the description is determined by edge width and nose radius requested by customers. For example, when the customer requires an edge width of 3.5mm and a nose radius of 0.3mm, the description of the insert would be ZTFD03503-EG.

(2) The nose radius range is $0.2 \leq R \leq 0.5$ on request.

General turning

Parting and grooving

Little squirrel series parting and grooving inserts



TURNING Parting and grooving tools

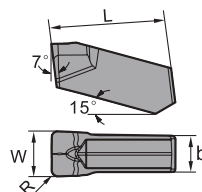
Little squirrel series parting and grooving inserts

General
turning

Parting and
grooving

Little squirrel series parting
and grooving inserts

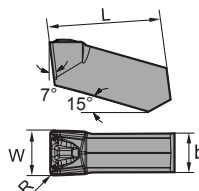
Single-edge grooving and turning inserts for semi-finishing and roughing difficult-to-machine materials



Type	Basic dimensions(mm)				Grade				
					PVD Coating				Cemented carbide
	W±0.05	R±0.1	b	L	YBG102	YBG202	YBG205	YBS103	YD101
ZIMF304N-NM	3	0.4	2.4	15.3	★	○	★	●	○
ZIMF406N-NM	4	0.6	3.2	15.3	★	○	★	●	○
ZIMF506N-NM	5	0.6	4.0	15.3	★	○	★	○	○
ZIMF608N-NM	6	0.8	4.0	15.3	★	○	★	○	○

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

Single-edge grooving and turning inserts for semi-finishing and roughing difficult-to-machine materials

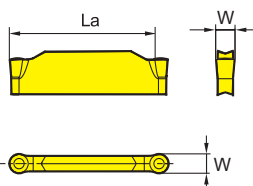


Type	Basic dimensions(mm)				Grade				
					PVD Coating				Cemented carbide
	W±0.05	R±0.1	b	L	YBG105	YBG212	YBG205	YBS103	YD101
ZIMF304N-SM	3	0.4	2.4	15.3	★	★		●	○
ZIMF404N-SM	4	0.4	3.2	15.3	★	★		○	○
ZIMF504N-SM	5	0.4	4.0	15.3	★	★		○	○
ZIMF604N-SM	6	0.4	5.1	15.3	★	★		○	○

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



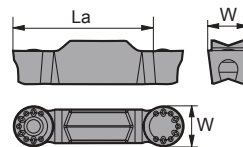
Profiling inserts



Type	Basic dimensions(mm)		Grade						
			CVD Coating		PVD Coating			Cemented carbide	
	$W^{+0.1}_0$	Cutting depth L_{max}	YBC151	YBC251	YBG202	YBG205	YBG302	YD101	
Double edges	ZRED025-MG	2.5	17.5		●	★	★		
	ZRFD03-MG	3.0	17		●	★	★		
	ZRGD04-MG	4.0	21		●	★	★		
	ZRHD05-MG	5.0	20		○	★	★		
	ZRKD06-MG	6.0	19		○	★	★		

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

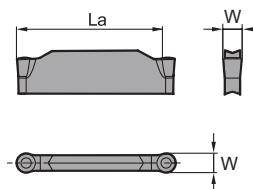
Profiling inserts



Type	Basic dimensions(mm)		Grade						
			CVD Coating		PVD Coating			Cemented carbide	
	$W \pm 0.025$	Cutting depth L_{max}	YBC151	YBC251	YBG105	YBG212	YBG302	YBS103	YD101
Double edges	ZRFD03-NM	3	17		★	★		●	
	ZRGD04-NM	4	21		★	★		●	
	ZRHD05-NM	5	20		★	★		○	
	ZRKD06-NM	6	19		★	★		○	

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

Precision profiling inserts



Type	Basic dimensions(mm)		Grade				
			CVD Coating		PVD Coating		Cemented carbide
	$W \pm 0.025$	Cutting depth L_{max}	YBC151	YBC251	YBG202	YBG302	YD101
Double edges	ZRFD03-EG	3.0	17		○	○	
	ZRGD04-EG	4.0	21		○	○	
	ZRHD05-EG	5.0	20		○	○	
	ZRKD06-EG	6.0	19		○	○	

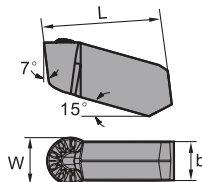
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order



TURNING Parting and grooving tools

Little squirrel series parting and grooving inserts

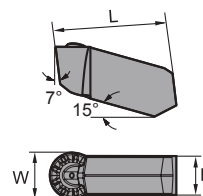
Single-edge inserts for profiling materials hard to be machined



Type	Basic dimensions(mm)			Grade			
				PVD Coating			Cemented carbide
	$W \pm 0.025$	b	L	YBG102	YBG202	YBS103	YD101
ZIGQ3N-NM	3	2.4	15.3	★	○	●	○
ZIGQ4N-NM	4	3.2	15.3	★	○	●	○
ZIGQ5N-NM	5	4.0	15.3	★	○	○	○
ZIGQ6N-NM	6	5.0	15.3	★	○	○	○

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

Single-edge inserts for profiling materials hard to be machined



Type	Basic dimensions(mm)			Grade			
				PVD Coating			Cemented carbide
	$W \pm 0.025$	b	L	YBG105	YBG212	YBS103	YD101
ZIGQ3N-NF	3	2.4	15.3	★	★	●	
ZIGQ4N-NF	4	3.2	15.3	★	★	○	
ZIGQ5N-NF	5	4.0	15.3	★	★	○	
ZIGQ6N-NF	6	5.0	15.3	★	★	○	

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

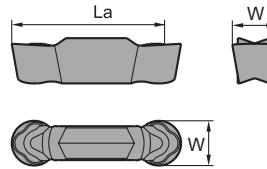
General turning

Parting and grooving

Little squirrel series parting and grooving inserts



Profiling inserts for Al



Type	Basic dimensions(mm)		Grade
			Cemented carbide
	$W \pm 0.02$	Cutting depth $L_{\max}$	YD101
ZRKD06-LH	6.0	19	★
ZRLD08-LH	8.0	22	★

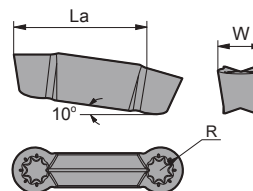
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

General turning

Parting and grooving

Little squirrel series parting and grooving inserts

Profiling inserts for Al



Type	Basic dimensions(mm)			Grade
				Cemented carbide
	$W \pm 0.02$	R	Cutting depth $L_{\max}$	YD101
ZILD08-LC	8.0	4.0	22	●

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



TURNING Parting and grooving tools

QC series shallow grooving inserts

QC series

shallow grooving inserts code key

General turning

Parting and grooving

QC series shallow grooving inserts

● Square head shallow groove inserts

QC

Shallow grooving inserts

22

Cutting edge length code	Inner tangent circle diameter(mm)
11	6.35
16	9.525
22	12.70

R

300

Grooving width(mm)

Code	Width
050	0.50
100	1.00
...	...
480	4.80

R

03

Rounding or chamfering(mm)

Code	Size
02	0.2
03	0.3
04	0.4

Direction

Code	Form
R	Rightward 
L	Leftward 

Inserts tip form

Code	Form
R	Circular arc 
C	Chamfering 

● Round head shallow groove inserts

QC

Shallow grooving inserts

22

Cutting edge length code	Inner tangent circle diameter(mm)
11	6.35
16	9.525
22	12.70

R

Direction

R	Rightward 
L	Leftward 

300

Grooving width(mm)

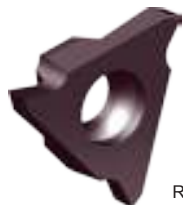
Code	Width
050	0.50
100	1.00
...	...
480	4.80

R

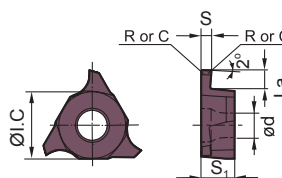
Head form: round head



Square head shallow groove inserts



R-type shown



Type		Basic dimensions(mm)						Grade	
								PVD Coating	
		$S \pm 0.025$	La_{max}	R/C	$\phi I.C$	S_1	ϕd	YBG202	YBG205
QC11R/L	120-R02	1.20	1.50	R0.2	6.35	3.18	2.8	○	○
	125-R02	1.25	1.50	R0.2	6.35	3.18	2.8	○	○
	145-R02	1.45	1.50	R0.2	6.35	3.18	2.8	○	○
	150-R02	1.50	1.50	R0.2	6.35	3.18	2.8	○	○
	200-R02	2.00	2.00	R0.2	6.35	3.18	2.8	○	○
	225-R02	2.25	2.00	R0.2	6.35	3.18	2.8	○	○
QC16R/L	110-R01	1.10	2.00	R0.1	9.525	3.18	4.4	○	○
	125-R02	1.25	2.00	R0.2	9.525	3.18	4.4	○	○
	145-R02	1.45	2.00	R0.2	9.525	3.18	4.4	○	○
	150-R02	1.50	2.00	R0.2	9.525	3.18	4.4	○	★
	175-R02	1.75	2.00	R0.2	9.525	3.18	4.4	○	○
	185-R02	1.85	2.50	R0.2	9.525	3.18	4.4	○	○
	200-R02	2.00	2.50	R0.2	9.525	3.18	4.4	○	★
	250-R02	2.50	2.50	R0.2	9.525	3.18	4.4	○	★
	300-R02	3.00	3.00	R0.2	9.525	3.18	4.4	○	★
QC22R/L	125-R02	1.25	2.00	R0.2	12.70	4.76	5.5	○	○
	145-R02	1.45	2.00	R0.2	12.70	4.76	5.5	○	○
	150-R02	1.50	3.50	R0.2	12.70	4.76	5.5	○	★
	175-R02	1.75	3.50	R0.2	12.70	4.76	5.5	○	○
	185-R02	1.85	3.50	R0.2	12.70	4.76	5.5	○	○
	200-R02	2.00	3.50	R0.2	12.70	4.76	5.5	○	★
	230-R02	2.30	3.50	R0.2	12.70	4.76	5.5	○	○
	250-R03	2.50	4.00	R0.3	12.70	4.76	5.5	○	★
	265-R03	2.65	4.00	R0.3	12.70	4.76	5.5	○	○
	280-R03	2.80	4.00	R0.3	12.70	4.76	5.5	○	○

★Recommended grade (always stock available)

●Available grade (always stock available)

○Make-to-order

General turning

Parting and grooving

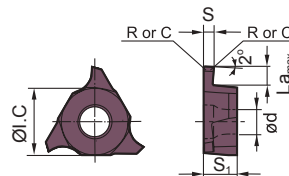
QC series shallow grooving inserts



Square head shallow groove inserts



R-type shown



Type		Basic dimensions(mm)						Grade	
								PVD Coating	
		$S \pm 0.025$	La_{max}	R/C	$\varnothing I.C$	S_1	$\varnothing d$	YBG202	YBG205
QC22R/L	300-R03	3.00	4.00	R0.3	12.70	4.76	5.5	○	★
	320-R03	3.20	4.00	R0.3	12.70	4.76	5.5	○	○
	330-R03	3.30	4.00	R0.3	12.70	4.76	5.5	○	○
	350-R03	3.50	5.00	R0.3	12.70	4.76	5.5	○	★
	400-R04	4.00	5.00	R0.4	12.70	4.76	5.5	○	★
	430-R04	4.30	5.00	R0.4	12.70	4.76	5.5	○	○
	450-R04	4.50	5.00	R0.4	12.70	4.76	5.5	○	○
	480-R04	4.80	5.00	R0.4	12.70	5.06	5.5	○	○

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

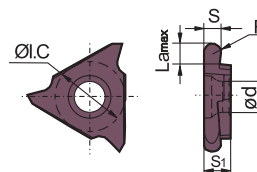
Example of special specification customization:

1. Custom-made insert width of 1.6mm, the tip form of the arc form, arc radius of 0.3mm right blade, I.C value of 12.7mm, then the custom-made insert model is QC22R160-R03.
2. Customized edge width range: QC11: 0.50~3.0mm; QC16: 0.50~3.0mm; QC22: 1.0~4.8mm.

Round head shallow groove inserts



R-type shown



Type		Basic dimensions(mm)						Grade	
								PVD Coating	
		$S \pm 0.025$	La_{max}	R/C	$\varnothing I.C$	S_1	$\varnothing d$	YBG202	YBG205
QC16R/L	200R	2.00	2.50	1.00	12.70	3.18	4.4	○	○
	300R	3.00	2.50	1.50	12.70	3.18	4.4	○	○
QC22R/L	100R	1.00	2.00	0.50	12.70	4.76	5.5	○	○
	150R	1.50	3.50	0.75	12.70	4.76	5.5	○	○
	200R	2.00	3.50	1.00	12.70	4.76	5.5	○	○
	250R	2.50	4.00	1.25	12.70	4.76	5.5	○	○
	300R	3.00	4.00	1.50	12.70	4.76	5.5	○	○
	400R	4.00	5.00	2.00	12.70	4.76	5.5	○	○

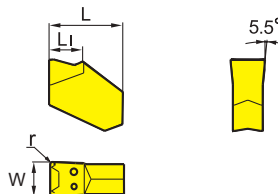
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Example of special specification customization:

Custom-made inserts width of 1.6mm, the tip form of the arc form, the arc radius of 0.8mm right insert, then the custom-made insert model is QC22R160R.



ZQMX series



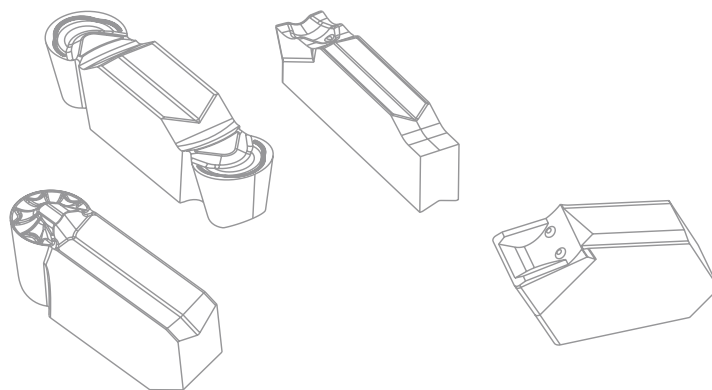
Type	Basic dimensions(mm)				Grade		
					CVD Coating	Cemented carbide	
	L1	W	r	L	YBC251	YC40	YD201
ZQMX3N11-1E	4.4	3.125	0.3	11	●	●	●
ZQMX4N11-1E	4.95	4.125	0.3	11	●	●	●
ZQMX5N11-1E	5.0	5.125	0.3	11	●	●	●
ZQMX6N11-1E	5.28	6.4	0.3	11	●	●	○
ZQMX7N11-1E	4.53	7.05	0.3	14		○	

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

General turning

Parting and grooving

Supplementary series parting and grooving inserts





TURNING / Parting and grooving tools

Little squirrel series parting and grooving tools

Little squirrel series parting and grooving tools code key

● External and surface turning

Code of grooving tools

Machining mode

E > External cutting **F** > End surface cutting

Code of locating slot

Accords with locating slot code of insert and corresponds to certain range of insert edge width

Code of edge number of corresponding inserts

S > Single cutting edge **D** > Double cutting edge

Q E G D - 2525 R 13
32 N

Q F G D 2525 R 22 S - 130 H

Nose height and width of tool holder

Left and right hand of tool

R > Right **L** > Left **N** > Both are acceptable

Maximum cutting depth

Supplementary code

S: Strengthened tool holder for external and surface deep grooving

The minimum diameter of end surface grooving tools for initial machining

Holder type of end surface grooving tools

H > Straight holder **L** > 90° holder

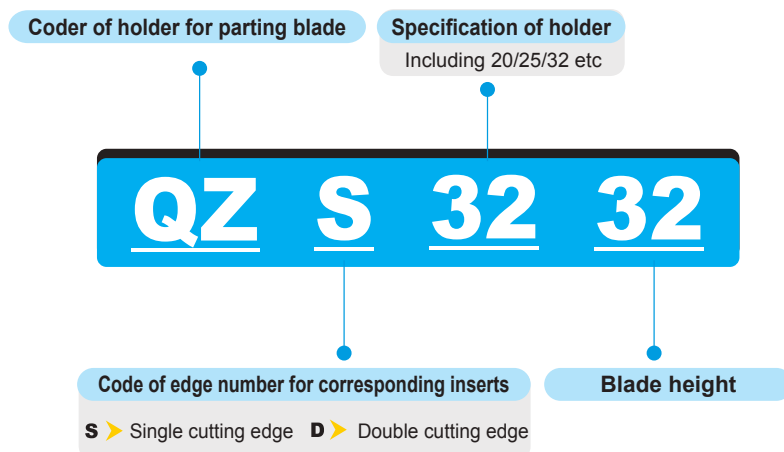
General turning

Parting and grooving

Little squirrel series parting and grooving tools



● Holder for parting blade

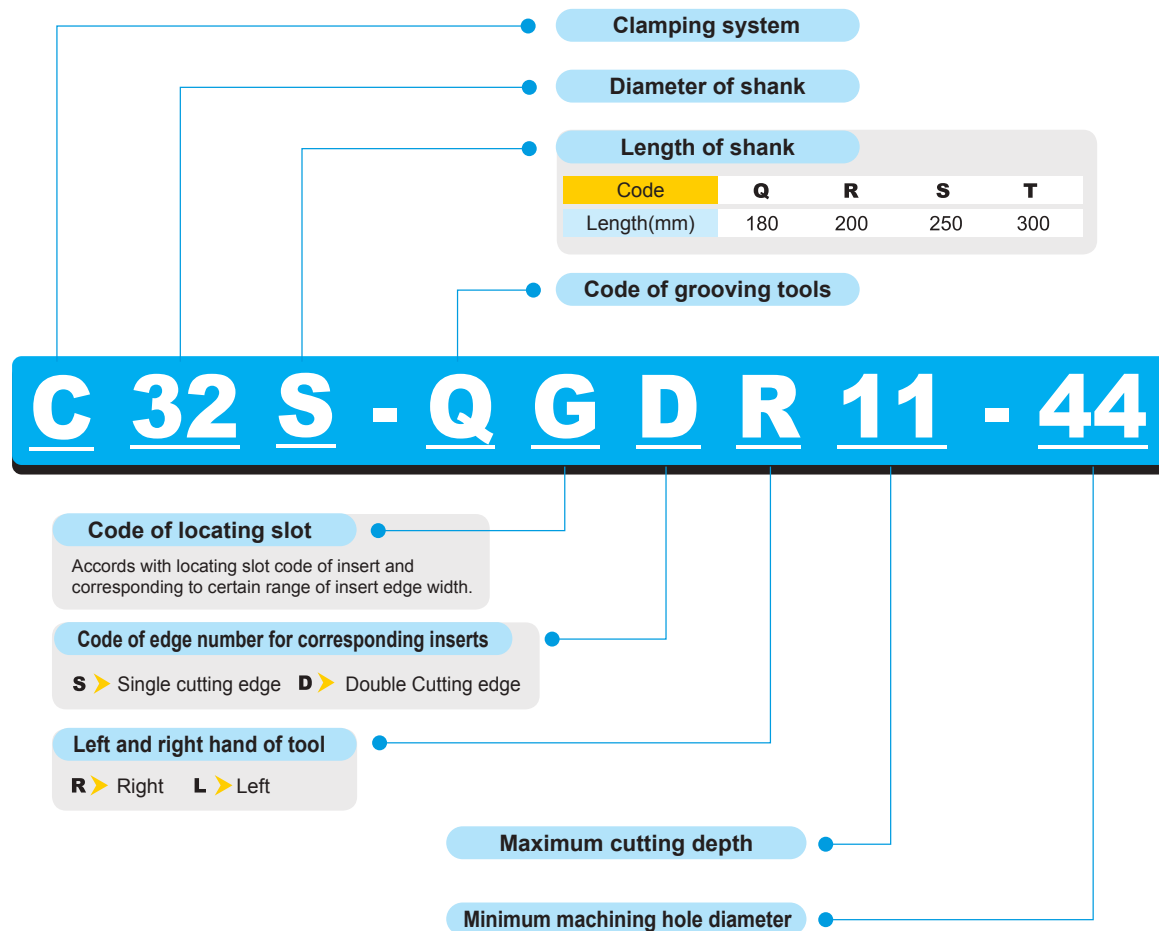


General turning

Parting and grooving

Little squirrel series parting and grooving tools

● Internal machining



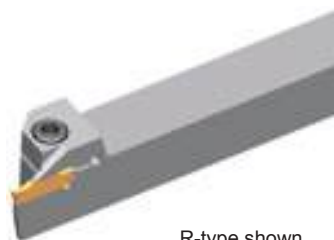


External parting, grooving and turning tools

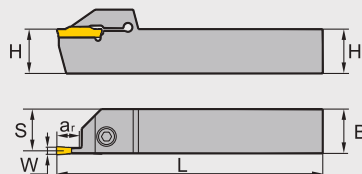
General
turning

Parting and
grooving

Little squirrel series parting
and grooving tools



R-type shown



Type		Stock		Basic dimensions(mm)					Applicable inserts	Screw	Wrench
		R	L	H×B	L	S	W	ar max			
QEAD	1212R/L07	▲	▲	12×12	125	11.4	1.5	7	Z□AD015□□	GB70-85-M4×12	WH30L
	1212R/L12	▲	▲	12×12	125	11.4	1.5	12	Z□AD015□□		
	1616R/L07	▲	▲	16×16	125	15.4	1.5	7	Z□AD015□□		
	1616R/L12	▲	▲	16×16	125	15.4	1.5	12	Z□AD015□□		
	2020R/L07	▲	▲	20×20	125	19.4	1.5	7	Z□AD015□□		
	2020R/L12	▲	▲	20×20	125	19.4	1.5	12	Z□AD015□□		
QEBD	1212R/L07	▲	▲	12×12	125	11.2	2	7	Z□BD02□□	GB70-85-M4×12	WH30L
	1212R/L10	▲	▲	12×12	125	11.2	2	10	Z□BD02□□		
	1212R/L14	▲	▲	12×12	125	11.2	2	14	Z□BD02□□		
	1616R/L07	▲	▲	16×16	125	15.2	2	7	Z□BD02□□		
	1616R/L10	▲	▲	16×16	125	15.2	2	10	Z□BD02□□		
	1616R/L14	▲	▲	16×16	125	15.2	2	14	Z□BD02□□		
	2020R/L07	▲	▲	20×20	125	19.2	2	7	Z□BD02□□	GB70-85-M5×16	WH40L
	2020R/L10	▲	▲	20×20	125	19.2	2	10	Z□BD02□□		
	2020R/L14	▲	▲	20×20	125	19.2	2	14	Z□BD02□□		
	2525R/L07	▲	▲	25×25	150	24.2	2	7	Z□BD02□□		
	2525R/L10	▲	▲	25×25	150	24.2	2	10	Z□BD02□□		
	2525R/L14	▲	▲	25×25	150	24.2	2	14	Z□BD02□□		
QEED	1616R/L10	▲	▲	16×16	125	15	2.5	10	Z□ED025□□	GB70-85-M5×20	WH40L
	1616R/L17	▲	▲	16×16	125	15	2.5	17	Z□ED025□□		
	2020R/L10	▲	▲	20×20	125	19	2.5	10	Z□ED025□□		
	2020R/L17	▲	▲	20×20	125	19	2.5	17	Z□ED025□□		
	2525R/L10	▲	▲	25×25	150	24	2.5	10	Z□ED025□□	GB70-85-M6×20	WH50L
	2525R/L17	▲	▲	25×25	150	24	2.5	17	Z□ED025□□		
QEFD	1616R/L10	▲	▲	16×16	125	14.8	3	10	Z□FD03□□	GB70-85-M5×20	WH40L
	1616R/L17	▲	▲	16×16	125	14.8	3	17	Z□FD03□□		
	2020R/L10	▲	▲	20×20	125	18.8	3	10	Z□FD03□□		
	2020R/L17	▲	▲	20×20	125	18.8	3	17	Z□FD03□□		
	2525R/L10	▲	▲	25×25	150	23.8	3	10	Z□FD03□□	GB70-85-M6×20	WH50L
	2525R/L17	▲	▲	25×25	150	23.8	3	17	Z□FD03□□		
QEGD	2020R/L13	▲	▲	20×20	140	18.5	4	13	Z□GD04□□	GB70-85-M6×20	WH50L
	2020R/L22	▲	▲	20×20	140	18.5	4	22	Z□GD04□□		
	2525R/L13	▲	▲	25×25	150	23.5	4	13	Z□GD04□□		

▲Stock available

△Make-to-order



External parting, grooving and turning tools

Type		Stock		Basic dimensions(mm)					Applicable inserts	Screw	Wrench
		R	L	H×B	L	S	W	ar max			
QEGD	2525R/L22	▲	▲	25×25	150	23.5	4	22	Z□GD04□□	GB70-85-M6×20	WH50L
	3232R/L13	▲	▲	32×32	170	30.5	4	13	Z□GD04□□		
	3232R/L22	▲	▲	32×32	170	30.5	4	22	Z□GD04□□		
QEHD	2525R/L13	▲	▲	25×25	150	23	5	13	Z□HD05□□	GB70-85-M6×20	WH50L
	2525R/L22	▲	▲	25×25	150	23	5	22	Z□HD05□□		
QEHS	2525N30	▲	▲	25×25	150	12.5	5	30	Z□HS05□□		
QEHD	3232R/L13	▲	▲	32×32	170	30	5	13	Z□HD05□□		
	3232R/L22	▲	▲	32×32	170	30	5	22	Z□HD05□□		
QEHS	3232N30	▲	▲	32×32	170	16	5	30	Z□HS05□□		
QEKD	2525R/L13	▲	▲	25×25	150	22.6	6	13	Z□KD06□□	GB70-85-M6×20	WH50L
	2525R/L22	▲	▲	25×25	150	22.6	6	22	Z□KD06□□		
QEKs	2525N30	▲	▲	25×25	150	12.5	6	30	Z□KS06□□		
QEKD	3232R/L13	▲	▲	32×32	170	29.6	6	13	Z□KD06□□		
	3232R/L22	▲	▲	32×32	170	29.6	6	22	Z□KD06□□		
QEKs	3232N30	▲	▲	32×32	170	16	6	30	Z□KS06□□		
QELD	2525R/L16	▲	▲	25×25	150	22	8	16	ZTLD0808-MM	GB70-85-M6×20	WH50L
	2525R/L25	▲	▲	25×25	150	22	8	25	ZTLD0808-MM	GB70-85-M6×20	WH50L
	3232R/L28	▲	▲	32×32	170	29	8	28	ZTLD0808-MM	GB70-85-M8×30	WH60L

▲Stock available

△Make-to-order

Precision grooving and turning tools

Type		Stock		Basic dimensions(mm)					Applicable inserts	Screw	Wrench
		R	L	H×B	L	S	W	ar max			
QECD	1616R/L025	△	△	16×16	125	14.75	1.0~2.4	2.5	ZTCD□□□□□-EG	GB70-85-M5×20	WH40L
	2020R/L025	▲	△	20×20	125	18.75				GB70-85-M6×20	WH50L
	2525R/L025	▲	△	25×25	150	23.75					

▲Stock available

△Make-to-order

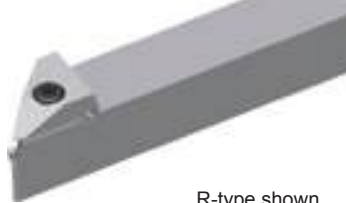
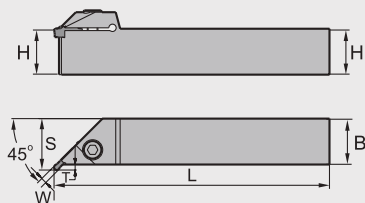
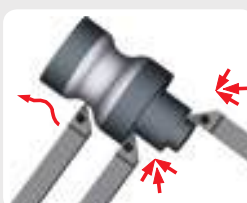
General
turningParting and
groovingLittle squirrel series parting
and grooving tools



TURNING Parting and grooving tools

Little squirrel series parting and grooving tools

External relief groove machining and profiling tools

R-type shown

Type		Stock		Basic dimensions(mm)					Applicable inserts	Screw	Wrench
		R	L	H×B	L	S	W	ar max			
QXFD	2020R/L03-45	△	△	20×20	125	23	3.0	3.0	ZR(T)FD03-□□	GB70-85-M6×20	WH50L
	2525R/L03-45	△	△	25×25	150	28					
	3232R/L03-45	△	△	32×32	170	35					
QXGD	2020R/L03-45	△	△	20×20	125	23	4.0	3.0	ZR(T)GD04-□□		
	2525R/L03-45	△	△	25×25	150	28					
	3232R/L03-45	△	△	32×32	170	35					
QXHD	2020R/L04-45	△	△	20×20	125	24	5.0	4.0	ZR(T)HD05-□□		
	2525R/L04-45	△	△	25×25	150	29					
	3232R/L04-45	△	△	32×32	170	36					
QXKD	2020R/L04-45	△	△	20×20	125	24	6.0	4.0	ZR(T)KD06-□□		
	2525R/L04-45	△	△	25×25	150	29					
	3232R/L04-45	△	△	32×32	170	36					

▲Stock available △Make-to-order

External grooving tools for difficult-to-machine materials

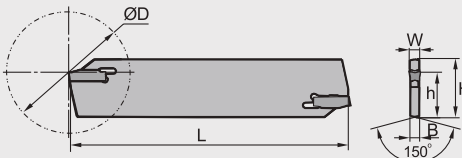
R-type shown

Type		Stock		Basic dimensions(mm)					Applicable inserts	Screw	Wrench
		R	L	H×B	L	S	W	ar max			
QEFS	2525R/L12-3N	△	△	25×25	150	25.3	3	12	ZIGQ3N-□□	GB70-85-M6×20	WH50L
	3232R/L22-3N	△	△	32×32	170	32.3	3	22	ZIMF304N-□□		
QEGS	2525R/L12-4N	△	△	25×25	150	25.3	4	12	ZIGQ4N-□□		
	3232R/L22-4N	△	△	32×32	170	32.3	4	22	ZIMF40□N-□□		
QEHS	2525R/L12-5N	△	△	25×25	150	25.4	5	12	ZIGQ5N-□□		
	3232R/L22-5N	△	△	32×32	170	32.4	5	22	ZIMF50□N-□□		
QEKs	2525R/L12-6N	△	△	25×25	150	25.4	6	12	ZIGQ6N-□□		
	3232R/L22-6N	△	△	32×32	170	32.4	6	22	ZIMF60□N-□□		

▲Stock available △Make-to-order



Blade for external parting

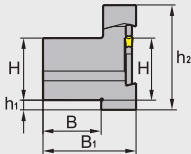




Type	Stock	Basic dimensions(mm)						Applicable inserts	Wrench
		L	H	h	B	W	ØDmax (Maximum parting diameter)		
QEES26N	▲	110	26	19	2	2.5	60	ZPES02502-MG	W50RL
QEFS26N	▲	110	26	19	2.4	3	60	ZPFS0302-MG	
QEGS26N	▲	110	26	19	3.2	4	70	ZPGS0402-MG	
QEHS26N	▲	110	26	19	4	5	70	ZPHS0503-MG	
QEKS26N	▲	110	26	19	5	6	70	ZPKS0604-MG	
QEES32N	▲	150	32	24.6	2	2.5	100	ZPES02502-MG	
QEFS32N	▲	150	32	24.6	2.4	3	100	ZPFS0302-MG	
QEGS32N	▲	150	32	24.6	3.2	4	120	ZPGS0402-MG	
QEHS32N	▲	150	32	24.6	4	5	120	ZPHS0503-MG	
QEKS32N	▲	150	32	24.6	5	6	120	ZPKS0604-MG	

▲Stock available

△Make-to-order

Holder for blade used for external parting

										
Type	Stock	Basic dimensions(mm)						Clamp	Screw	Wrench
		L	H	h ₁	h ₂	B	B ₁			
QZS2026	▲	86	20	10	46.6	19	38	QZC26	GB70-85-M6×20	WH50L
QZS2526	▲	86	25	5	46.6	23	42	QZC26		
QZS3226	▲	86	30	3	51.6	30	48	QZC26		
QZS2032	▲	110	20	13	50	19	38	QZC32		
QZS2532	▲	110	25	8	50	23	42	QZC32		
QZS3232	▲	110	32	5	54	30	48	QZC32		

▲Stock available

△Make-to-order

General turning

Parting and grooving

Little squirrel series parting and grooving tools



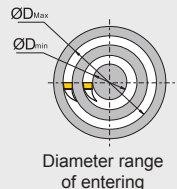
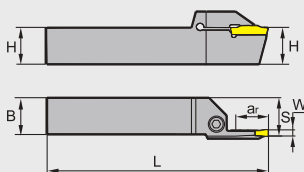
TURNING Parting and grooving tools

Little squirrel series parting and grooving tools

End surface grooving and turning tools



L-type shown



Type		Stock		Basic dimensions(mm)						Applicable inserts	Screw	Wrench		
		R	L	H×B	L	S	W	a _r max	ØD (min-max)					
QFFD	2020R/L7-48H	▲	▲	20×20	150	21	3	7	48-66	ZTFD0303-□□	GB70-85-M6×20	WH50L		
	2020R/L10-48H	▲	▲	20×20	150	21	3	10	48-66					
	2525R/L10-48H	▲	▲	25×25	150	26	3	10	48-66					
	2525R/L17-48H	▲	▲	25×25	150	26	3	17	48-66					
	2020R/L7-60H	△	△	20×20	150	21	3	7	60-80					
	2020R/L10-60H	△	△	20×20	150	21	3	10	60-80					
	2525R/L10-60H	▲	▲	25×25	150	26	3	10	60-80					
	2525R/L17-60H	▲	▲	25×25	150	26	3	17	60-80					
	2020R/L7-74H	△	△	20×20	150	21	3	7	74-110					
	2020R/L10-74H	△	▲	20×20	150	21	3	10	74-110					
	2525R/L10-74H	▲	▲	25×25	150	26	3	10	74-110					
	2525R/L17-74H	▲	▲	25×25	150	26	3	17	74-110					
	2020R/L7-100H	△	△	20×20	150	21	3	7	100-150					
	2020R/L10-100H	△	△	20×20	150	21	3	10	100-150					
	2525R/L10-100H	▲	▲	25×25	150	26	3	10	100-150					
	2525R/L17-100H	▲	▲	25×25	150	26	3	17	100-150					
QFGD	2020R/L10-52H	△	△	20×20	150	21	4	10	52-72	ZTGD0404-□□			GB70-85-M6×20	WH50L
	2525R/L13-52H	▲	▲	25×25	150	26	4	13	52-72					
	2020R/L15-52H	△	△	20×20	150	21	4	15	52-72					
	2525R/L22-52H	▲	▲	25×25	150	26	4	22	52-72					
	2020R/L10-64H	△	▲	20×20	150	21	4	10	64-100					
	2525R/L13-64H	▲	▲	25×25	150	26	4	13	64-100					
	2020R/L15-64H	△	△	20×20	150	21	4	15	64-100					
	2525R/L22-64H	▲	▲	25×25	150	26	4	22	64-100					
	2020R/L10-90H	△	△	20×20	150	21	4	10	90-140					
	2525R/L13-90H	▲	▲	25×25	150	26	4	13	90-140					
	2020R/L15-90H	△	△	20×20	150	21	4	15	90-140					
	2525R/L22-90H	▲	▲	25×25	150	26	4	22	90-140					
	2020R/L10-130H	△	△	20×20	150	21	4	10	130-230					
	2525R/L13-130H	▲	▲	25×25	150	26	4	13	130-230					
	2020R/L15-130H	△	△	20×20	150	21	4	15	130-230					
	2525R/L22-130H	▲	▲	25×25	150	26	4	22	130-230					

▲Stock available

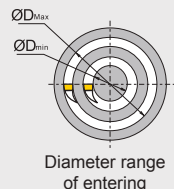
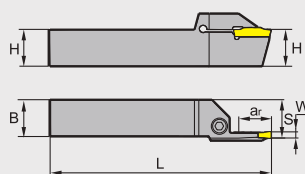
△Make-to-order



End surface grooving and turning tools



L-type shown



Type		Stock		Basic dimensions(mm)						Applicable inserts	Screw	Wrench
		R	L	H×B	L	S	W	ar max	ØD (min-max)			
QFHD	2525R/L13-58H	▲	▲	25×25	150	26	5	13	58-96	ZTHD0504-□□	GB70-85-M6×20	WH50L
	2525R/L22-58H	▲	▲	25×25	150	26	5	22	58-96			
	2525R/L13-86H	△	▲	25×25	150	26	5	13	86-140			
	2525R/L22-86H	▲	▲	25×25	150	26	5	22	86-140			
	2525R/L13-130H	▲	▲	25×25	150	26	5	13	130-200			
	2525R/L22-130H	▲	▲	25×25	150	26	5	22	130-200			
	2525R/L13-185H	▲	▲	25×25	150	26	5	13	185-400			
	2525R/L22-185H	▲	▲	25×25	150	26	5	22	185-400			
QFHS	2525R/L30-185H	△	△	25×25	150	26	5	30	185-400	ZTHS0504-MG		
QFKD	2525R/L13-60H	▲	▲	25×25	150	26	6	13	60-100	ZTKD0608-□□	GB70-85-M6×20	WH50L
	2525R/L22-60H	▲	▲	25×25	150	26	6	22	60-100			
	2525R/L13-88H	△	▲	25×25	150	26	6	13	88-180			
	2525R/L22-88H	▲	▲	25×25	150	26	6	22	88-180			
	2525R/L13-160H	▲	▲	25×25	150	26	6	13	160-400			
	2525R/L22-160H	▲	▲	25×25	150	26	6	22	160-400			
QFKS	2525R/L30-160H	△	△	25×25	150	26	6	30	160-400	ZTKS0608-MG		
QFLD	2525R/L25-75H	▲	▲	25×25	150	27	8	25	75-150	ZTLD0808-MM	GB70-85-M6×20	WH50L
	2525R/L25-140H	▲	▲	25×25	150	27	8	25	140-400	ZTLD0808-MM	GB70-85-M6×20	WH50L
	3232R/L28-140H	▲	▲	32×32	170	30	8	28	140-400	ZTLD0808-MM	GB70-85-M8×30	WH60L

▲Stock available

△Make-to-order

General turning

Parting and grooving

Little squirrel series parting and grooving tools



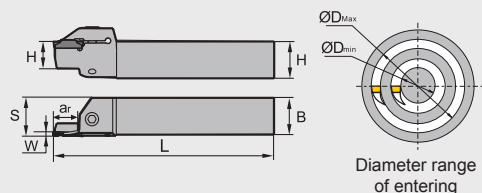
TURNING Parting and grooving tools

Little squirrel series parting and grooving tools

End surface grooving and turning tools



RR-type shown



Diameter range of entering



Type		Stock	Basic dimensions(mm)						Applicable inserts	Screw	Wrench		
			H×B	L	S	W	ar max	ØD (min-max)					
QFFD	2020RR7-48H	△	20×20	150	21	3	7	48-66	ZTFD0303-□□	GB70-85-M6×20	WH50L		
	2020RR10-48H	△	20×20	150	21	3	10	48-66					
	2525RR10-48H	△	25×25	150	26	3	10	48-66					
	2525RR17-48H	△	25×25	150	26	3	17	48-66					
	2020RR7-60H	△	20×20	150	21	3	7	60-80					
	2020RR10-60H	△	20×20	150	21	3	10	60-80					
	2525RR10-60H	△	25×25	150	26	3	10	60-80					
	2525RR17-60H	△	25×25	150	26	3	17	60-80					
	2020RR7-74H	△	20×20	150	21	3	7	74-110					
	2020RR10-74H	△	20×20	150	21	3	10	74-110					
	2525RR10-74H	△	25×25	150	26	3	10	74-110					
	2525RR17-74H	△	25×25	150	26	3	17	74-110					
	2020RR7-100H	△	20×20	150	21	3	7	100-150					
	2020RR10-100H	△	20×20	150	21	3	10	100-150					
	2525RR10-100H	△	25×25	150	26	3	10	100-150					
	2525RR17-100H	△	25×25	150	26	3	17	100-150					
QFGD	2020RR10-52H	△	20×20	150	21	4	10	52-72	ZTGD0404-□□				
	2020RR15-52H	△	20×20	150	26	4	15	52-72					
	2525RR13-52H	△	25×25	150	21	4	13	52-72					
	2525RR22-52H	△	25×25	150	26	4	22	52-72					
	2020RR10-64H	△	20×20	150	21	4	10	64-100					
	2020RR15-64H	△	20×20	150	26	4	15	64-100					
	2525RR13-64H	△	25×25	150	21	4	13	64-100					
	2525RR22-64H	△	25×25	150	26	4	22	64-100					
	2020RR10-90H	△	20×20	150	21	4	10	90-140					
	2020RR15-90H	△	20×20	150	26	4	15	90-140					
	2525RR13-90H	△	25×25	150	21	4	13	90-140					
	2525RR22-90H	△	25×25	150	26	4	22	90-140					
	2020RR10-130H	△	20×20	150	21	4	10	130-230					
	2020RR15-130H	△	20×20	150	26	4	15	130-230					
	2525RR13-130H	△	25×25	150	21	4	13	130-230					
	2525RR22-130H	△	25×25	150	26	4	22	130-230					

▲Stock available

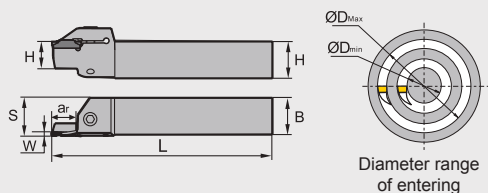
△Make-to-order



End surface grooving and turning tools



RR-type shown



Type	Stock	Basic dimensions(mm)							Applicable inserts	Screw	Wrench
		H×B	L	S	W	a _r max	ØD (min-max)				
QFHD	2525RR13-58H	△	25×25	150	26	5	13	58-96	ZTHD0504-□□	GB70-85-M6×20	WH50L
	2525RR22-58H	△	25×25	150	26	5	22	58-96			
	2525RR13-86H	△	25×25	150	26	5	13	86-140			
	2525RR22-86H	△	25×25	150	26	5	22	86-140			
	2525RR13-130H	△	25×25	150	26	5	13	130-200			
	2525RR22-130H	△	25×25	150	26	5	22	130-200			
	2525RR13-185H	△	25×25	150	26	5	13	185-400			
	2525RR22-185H	△	25×25	150	26	5	22	185-400			
QFHS	2525RR30-185H	△	25×25	150	26	5	30	185-400	ZTHS0504-MG		
QFKD	2525RR13-60H	△	25×25	150	26	6	13	60-100	ZTKD0608-□□	GB70-85-M6×20	WH50L
	2525RR22-60H	△	25×25	150	26	6	22	60-100			
	2525RR13-88H	△	25×25	150	26	6	13	88-180			
	2525RR22-88H	△	25×25	150	26	6	22	88-180			
	2525RR13-160H	△	25×25	150	26	6	13	160-400			
	2525RR22-160H	△	25×25	150	26	6	22	160-400			
QFKS	2525RR30-160H	△	25×25	150	26	6	30	160-400	ZTKS0608-MG		

▲Stock available

△Make-to-order

General turning

Parting and grooving

Little squirrel series parting and grooving tools



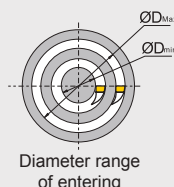
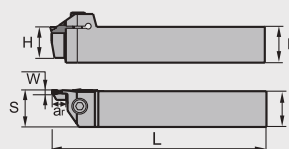
TURNING Parting and grooving tools

Little squirrel series parting and grooving tools

End surface grooving and turning tools



LL-type shown



Type		Stock	Basic dimensions(mm)						Applicable inserts	Screw	Wrench		
			H×B	L	S	W	a _r max	ØD (min-max)					
QFFD	2020LL7-48H	△	20×20	150	21	3	7	48-66	ZTFD0303-□□	GB70-85-M6×20	WH50L		
	2020LL10-48H	△	20×20	150	21	3	10	48-66					
	2525LL10-48H	△	25×25	150	26	3	10	48-66					
	2525LL17-48H	△	25×25	150	26	3	17	48-66					
	2020LL7-60H	△	20×20	150	21	3	7	60-80					
	2020LL10-60H	△	20×20	150	21	3	10	60-80					
	2525LL10-60H	△	25×25	150	26	3	10	60-80					
	2525LL17-60H	△	25×25	150	26	3	17	60-80					
	2020LL7-74H	△	20×20	150	21	3	7	74-110					
	2020LL10-74H	△	20×20	150	21	3	10	74-110					
	2525LL10-74H	△	25×25	150	26	3	10	74-110					
	2525LL17-74H	△	25×25	150	26	3	17	74-110					
	2020LL7-100H	△	20×20	150	21	3	7	100-150					
	2020LL10-100H	△	20×20	150	21	3	10	100-150					
	2525LL10-100H	△	25×25	150	26	3	10	100-150					
	2525LL17-100H	△	25×25	150	26	3	17	100-150					
QFGD	2020LL10-52H	△	20×20	150	21	4	10	52-72	ZTGD0404-□□			GB70-85-M6×20	WH50L
	2020LL15-52H	△	20×20	150	26	4	15	52-72					
	2525LL13-52H	△	25×25	150	21	4	13	52-72					
	2525LL22-52H	△	25×25	150	26	4	22	52-72					
	2020LL10-64H	△	20×20	150	21	4	10	64-100					
	2020LL15-64H	△	20×20	150	26	4	15	64-100					
	2525LL13-64H	△	25×25	150	21	4	13	64-100					
	2525LL22-64H	△	25×25	150	26	4	22	64-100					
	2020LL10-90H	△	20×20	150	21	4	10	90-140					
	2020LL15-90H	△	20×20	150	26	4	15	90-140					
	2525LL13-90H	△	25×25	150	21	4	13	90-140					
	2525LL22-90H	△	25×25	150	26	4	22	90-140					
	2020LL10-130H	△	20×20	150	21	4	10	130-230					
	2020LL15-130H	△	20×20	150	26	4	15	130-230					
	2525LL13-130H	△	25×25	150	21	4	13	130-230					
	2525LL22-130H	△	25×25	150	26	4	22	130-230					

▲ Stock available

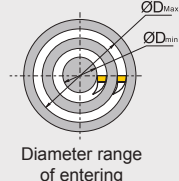
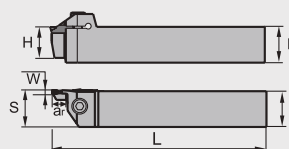
△ Make-to-order



End surface grooving and turning tools



LL-type shown



Diameter range of entering



Type		Stock	Basic dimensions(mm)						Applicable inserts	Screw	Wrench
			H×B	L	S	W	αr max	$\varnothing D$ (min-max)			
QFHD	2525LL13-58H	△	25×25	150	26	5	13	58-96	ZTHD0504-□□	GB70-85-M6×20	WH50L
	2525LL22-58H	△	25×25	150	26	5	22	58-96			
	2525LL13-86H	△	25×25	150	26	5	13	86-140			
	2525LL22-86H	△	25×25	150	26	5	22	86-140			
	2525LL13-130H	△	25×25	150	26	5	13	130-200			
	2525LL22-130H	△	25×25	150	26	5	22	130-200			
	2525LL13-185H	△	25×25	150	26	5	13	185-400			
	2525LL22-185H	△	25×25	150	26	5	22	185-400			
QFHS	2525LL30-185H	△	25×25	150	26	5	30	185-400	ZTHS0504-MG		
QFKD	2525LL13-60H	△	25×25	150	26	6	13	60-100	ZTKD0608-□□	GB70-85-M6×20	WH50L
	2525LL22-60H	△	25×25	150	26	6	22	60-100			
	2525LL13-88H	△	25×25	150	26	6	13	88-180			
	2525LL22-88H	△	25×25	150	26	6	22	88-180			
	2525LL13-160H	△	25×25	150	26	6	13	160-400			
	2525LL22-160H	△	25×25	150	26	6	22	160-400			
QFKS	2525LL30-160H	△	25×25	150	26	6	30	160-400	ZTKS0608-MG		

▲Stock available

△Make-to-order

General turning

Parting and grooving

Little squirrel series parting and grooving tools



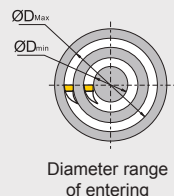
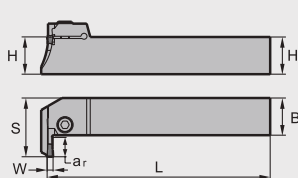
TURNING Parting and grooving tools

Little squirrel series parting and grooving tools

L type tools for surface grooving and turning



R-type shown



Diameter range of entering



Type		Stock		Basic dimensions(mm)						Applicable inserts	Screw	Wrench		
		R	L	H×B	L	S	W	a _r max	ØD (min-max)					
QFFD	2020R/L7-48L	△	△	20×20	150	28.5	3	7	48-66	ZTFD0303-□□	GB70-85-M6×20	WH50L		
	2020R/L10-48L	△	△	20×20	150	31.5	3	10	48-66					
	2525R/L10-48L	▲	▲	25×25	150	36.5	3	10	48-66					
	2525R/L17-48L	△	△	25×25	150	43.5	3	17	48-66					
	2020R/L7-60L	△	△	20×20	150	28.5	3	7	60-80					
	2020R/L10-60L	△	△	20×20	150	31.5	3	10	60-80					
	2525R/L10-60L	▲	▲	25×25	150	36.5	3	10	60-80					
	2525R/L17-60L	△	△	25×25	150	43.5	3	17	60-80					
	2020R/L7-74L	△	△	20×20	150	28.5	3	7	74-110					
	2020R/L10-74L	△	△	20×20	150	31.5	3	10	74-110					
	2525R/L10-74L	▲	▲	25×25	150	36.5	3	10	74-110					
	2525R/L17-74L	△	△	25×25	150	43.5	3	17	74-110					
	2020R/L7-100L	△	△	20×20	150	28.5	3	7	100-150					
	2020R/L10-100L	△	△	20×20	150	31.5	3	10	100-150					
	2525R/L10-100L	▲	▲	25×25	150	36.5	3	10	100-150					
	2525R/L17-100L	△	△	25×25	150	43.5	3	17	100-150					
QFGD	2020R/L10-52L	△	△	20×20	150	31.5	4	10	52-72	ZTGD0404-□□			GB70-85-M6×20	WH50L
	2525R/L13-52L	▲	△	25×25	150	39.5	4	13	52-72					
	2020R/L15-52L	△	△	20×20	150	36.5	4	15	52-72					
	2525R/L22-52L	△	△	25×25	150	48.5	4	22	52-72					
	2020R/L10-64L	△	△	20×20	150	31.5	4	10	64-100					
	2525R/L13-64L	△	△	25×25	150	39.5	4	13	64-100					
	2020R/L15-64L	△	△	20×20	150	36.5	4	15	64-100					
	2525R/L22-64L	△	△	25×25	150	48.5	4	22	64-100					
	2020R/L10-90L	△	△	20×20	150	31.5	4	10	90-140					
	2525R/L13-90L	△	△	25×25	150	39.5	4	13	90-140					
	2020R/L15-90L	△	△	20×20	150	36.5	4	15	90-140					
	2525R/L22-90L	▲	△	25×25	150	48.5	4	22	90-140					
	2020R/L10-130L	△	△	20×20	150	31.5	4	10	130-230					
	2525R/L13-130L	△	△	25×25	150	39.5	4	13	130-230					
	2020R/L15-130L	△	△	20×20	150	36.5	4	15	130-230					
	2525R/L22-130L	▲	▲	25×25	150	48.5	4	22	130-230					

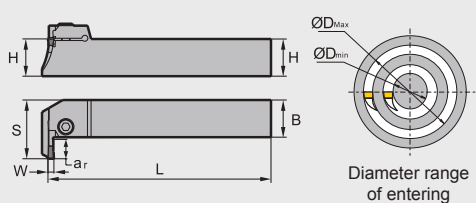
▲ Stock available

△ Make-to-order



L type tools for surface grooving and turning





Diameter range of entering



R-type shown

Type		Stock		Basic dimensions(mm)						Applicable inserts	Screw	Wrench
		R	L	H×B	L	S	W	ar _{max}	ØD (min-max)			
QFHD	2525R/L13-58L	△	△	25×25	150	39.5	5	13	58-96	ZTHD0504-□□	GB70-85-M6×20	WH50L
	2525R/L22-58L	△	△	25×25	150	48.5	5	22	58-96			
	2525R/L13-86L	△	△	25×25	150	39.5	5	13	86-140			
	2525R/L22-86L	△	△	25×25	150	48.5	5	22	86-140			
	2525R/L13-130L	△	△	25×25	150	39.5	5	13	130-200			
	2525R/L22-130L	△	△	25×25	150	48.5	5	22	130-200			
	2525R/L13-185L	△	△	25×25	150	39.5	5	13	185-400			
	2525R/L22-185L	▲	△	25×25	150	48.5	5	22	185-400			
QFHS	2525R/L30-185L	△	△	25×25	150	56.5	5	30	185-400	ZTHS0504-MG		
QFKD	2525R/L13-60L	▲	▲	25×25	150	39.5	6	13	60-100	ZTKD0608-□□	GB70-85-M6×20	WH50L
	2525R/L22-60L	▲	▲	25×25	150	48.5	6	22	60-100			
	2525R/L13-88L	△	▲	25×25	150	39.5	6	13	88-180			
	2525R/L22-88L	▲	▲	25×25	150	48.5	6	22	88-180			

▲Stock available

△Make-to-order

General turning

Parting and grooving

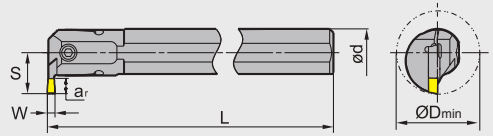
Little squirrel series parting and grooving tools



TURNING Parting and grooving tools

Little squirrel series parting and grooving tools

Internal grooving and turning tools

  											
R-type shown											
Type	Stock		Basic dimensions(mm)						Applicable inserts	Screw	Wrench
	R	L	ød	L	S	W	ar max	ØDmin			
C20Q-QEDR/L05-27	▲	▲	20	180	15.2	2.5	5	27	ZTED025□□ ZRED025□□	GB70-85-M4×12	WH30L
C25R-QEDR/L07-33	▲	▲	25	200	20.3	2.5	7	33		GB70-85-M5×16	WH40L
C32S-QEDR/L09-42	▲	▲	32	250	25.3	2.5	9	42		GB70-85-M5×20	
C20Q-QFDR/L05-27	▲	▲	20	180	15.2	3	5	27	ZTFD03□□ ZRFD03□□	GB70-85-M4×12	WH30L
C25R-QFDR/L07-33	▲	▲	25	200	20.3	3	7	33		GB70-85-M5×16	WH40L
C32S-QFDR/L09-42	▲	▲	32	250	25.3	3	9	42		GB70-85-M5×20	
C25R-QGDR/L08-35	▲	▲	25	200	21.5	4	8	35	ZTGD04□□ ZRGD04□□	GB70-85-M5×16	WH40L
C32S-QGDR/L11-44	▲	▲	32	250	27.5	4	11	44		GB70-85-M6×20	WH50L
C40T-QGDR/L13-54	▲	▲	40	300	33.5	4	13	54		GB70-85-M6×20	
C25R-QHDR/L08-35	▲	▲	25	200	21.5	5	8	35	ZTHD05□□ ZRHD05□□	GB70-85-M5×16	WH40L
C32S-QHDR/L11-44	▲	▲	32	250	27.5	5	11	44		GB70-85-M6×20	WH50L
C40T-QHDR/L13-54	▲	▲	40	300	33.5	5	13	54		GB70-85-M6×20	
C25R-QKDR/L08-35	▲	▲	25	200	21.5	6	8	35	ZTKD06□□ ZRKD06□□	GB70-85-M5×16	WH40L
C32S-QKDR/L11-44	▲	▲	32	250	27.5	6	11	44		GB70-85-M6×20	WH50L
C40T-QKDR/L13-54	▲	▲	40	300	33.5	6	13	54		GB70-85-M6×20	

▲Stock available

△Make-to-order

Profile turning tools for Al

R-type shown

Type	Stock		Basic dimensions(mm)					Applicable inserts	Screw	Wrench
	R	L	ØD (Minimum machining diameter)	ød	S	L1	L2			
C40X-QLDR/L65-15A	▲	▲	160	40	21	320	65	ZRLD08-LH	GB70-85-M6×20	WH50L
C40X-QLDR/L80-15A	▲	△	160	40	21	320	80	ZRLD08-LH		
C40X-QKDR/L60-15A	△	△	160	40	20	320	60	ZRKD06-LH		
C40X-QKDR/L75-15A	△	△	160	40	20	320	75	ZRKD06-LH		

▲Stock available

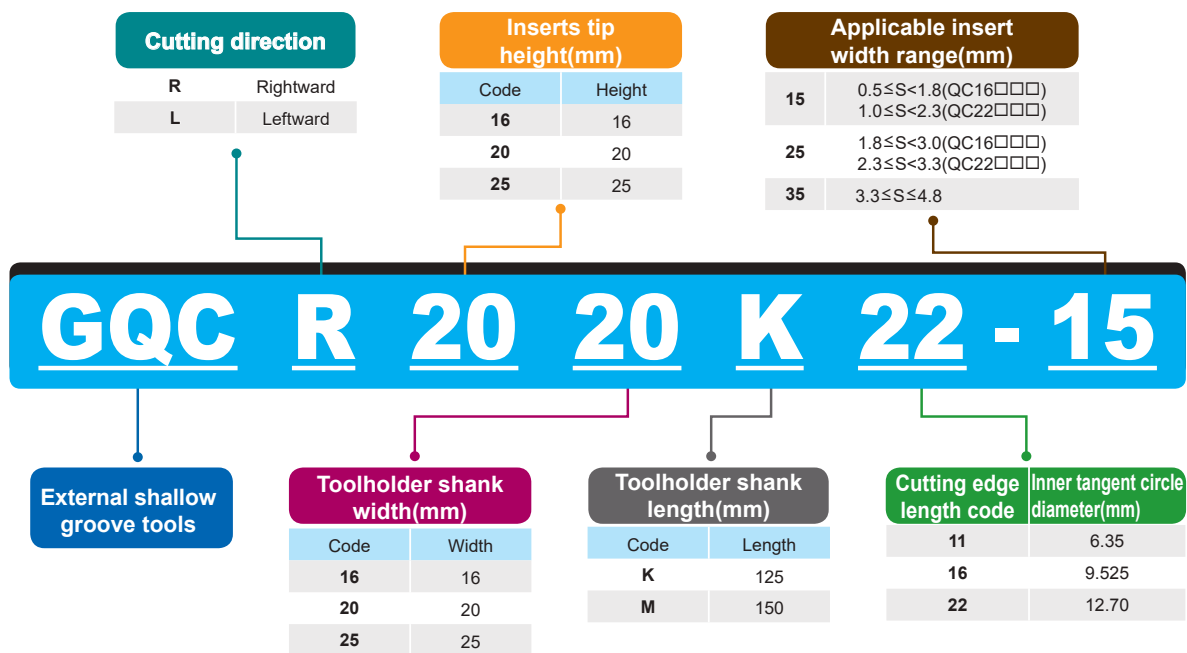
△Make-to-order



QC series

shallow grooving tools code key

● External shallow groove tools

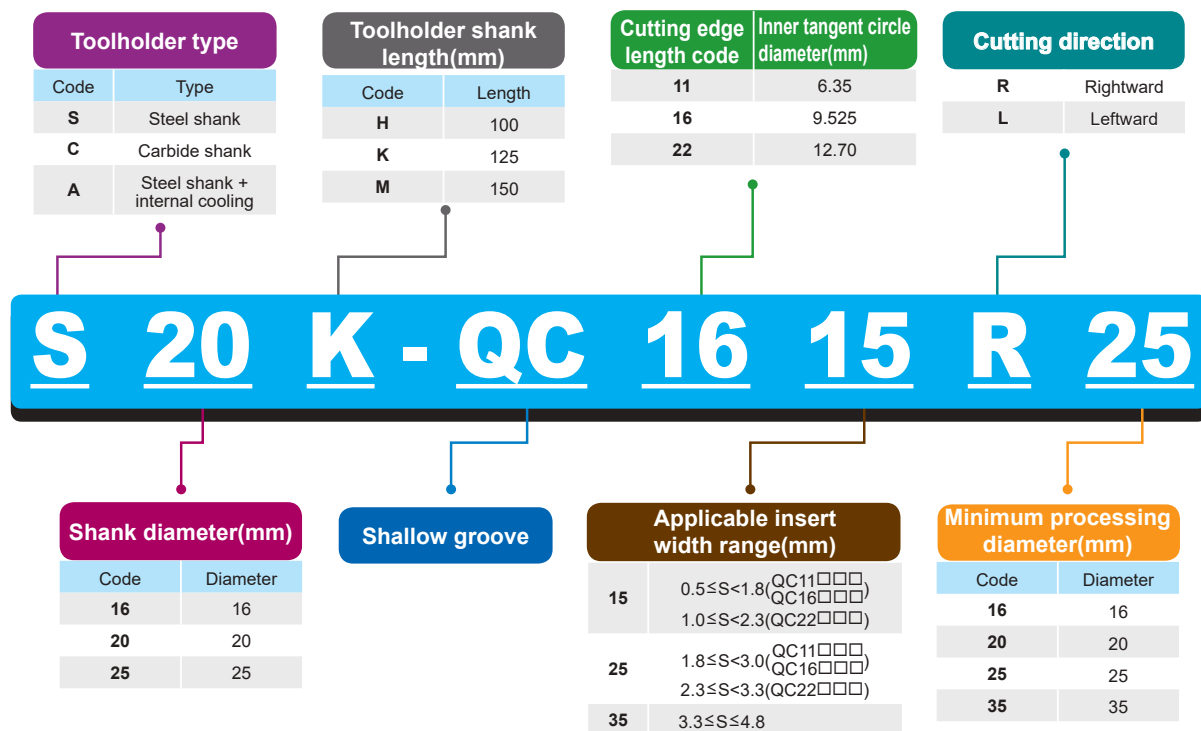


General turning

Parting and grooving

QC series shallow grooving tools

● Internal shallow groove tools

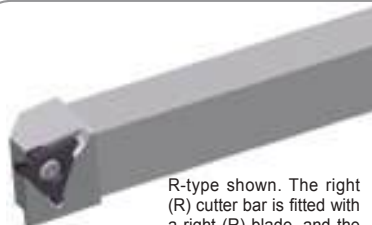




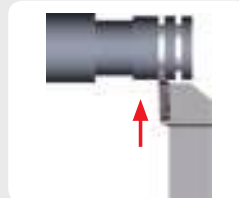
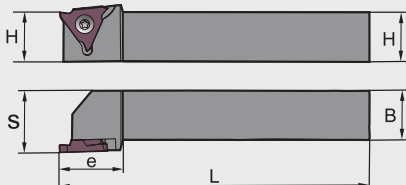
TURNING Parting and grooving tools

QC series shallow grooving tools

External shallow groove tools



R-type shown. The right (R) cutter bar is fitted with a right (R) blade, and the left (L) cutter bar is fitted with a left (L) blade.



Type		Stock	Basic dimensions(mm)					Width (mm)	Applicable inserts	Screw	Wrench
			H	B	S	e	L				
GQCR/L	1616K16-15	▲	16	16	21	25.5	125	1.1-1.8	QC16R/L 110~180	I60M3.5×10	WT15IP
	2020K16-15	▲	20	20	25		125				
	2525M16-15	▲	25	25	30		150				
	1616K16-25	▲	16	16	21		125	1.8-3.0	QC16R/L 180~300		
	2020K16-25	▲	20	20	25		125				
	2525M16-25	▲	25	25	30		150				
	2020K22-15	▲	20	20	25		125	1.0-2.3	QC22R/L 100~230	I60M5×13	WT20IP
	2525M22-15	▲	25	25	30		150				
	2020K22-25	▲	20	20	25		125				
	2525M22-25	▲	25	25	30		150				
	2020K22-35	▲	20	20	25		125	3.3-4.8	QC22R/L 330~480		
	2525M22-35	▲	25	25	30		150				

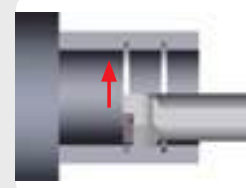
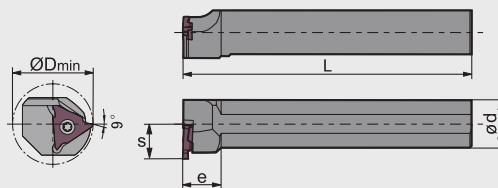
▲Stock available

△Make-to-order

Internal shallow groove tools



L-type shown. The right (R) cutter bar is fitted with a right (R) blade, and the left (L) cutter bar is fitted with a left (L) blade.



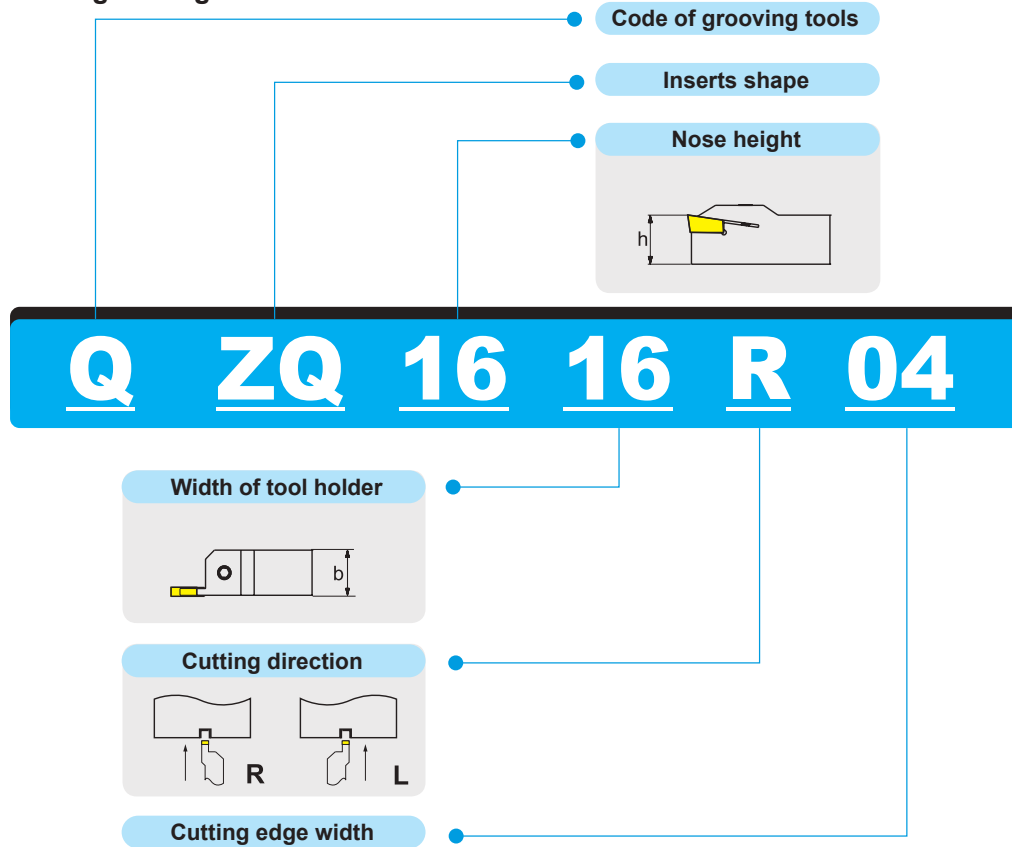
Type	Stock	Basic dimensions(mm)					Width (mm)	Applicable inserts	Screw	Wrench
		ØDmin	ød	S	e	L				
S20K-QC1115R/L 16	▲	16	20	11.1	40	125	1.2-1.8	QC11R/L 120~180	I60M2.5×6.5	WT07IP
S20K-QC1125R/L 16	▲	16	20	11.1	40	125	1.8-3.0	QC11R/L180~300		
S16H-QC1115R/L 20	▲	21	16	11.5	12	100	1.2-1.8	QC11R/L 120~180		
S16H-QC1125R/L 20	▲	21	16	11.5	12	100	1.8-3.0	QC11R/L180~300		
S20M-QC1615R/L 25	▲	26	20	12.5	15	150	1.1-1.8	QC16R/L110~180	I60M3.5×10	WT15IP
S20M-QC1625R/L 25	▲			12.5			1.8-3.0	QC16R/L180~300		
S25M-QC2215R/L 35	▲	35	25	18.2	20	150	1.0-2.3	QC22R/L100~230	I60M5×13	WT20IP
S25M-QC2225R/L 35	▲			18.2			2.3-3.3	QC22R/L230~330		
S25M-QC2235R/L 35	▲			18.2			3.3-4.8	QC22R/L 330~480		

▲Stock available

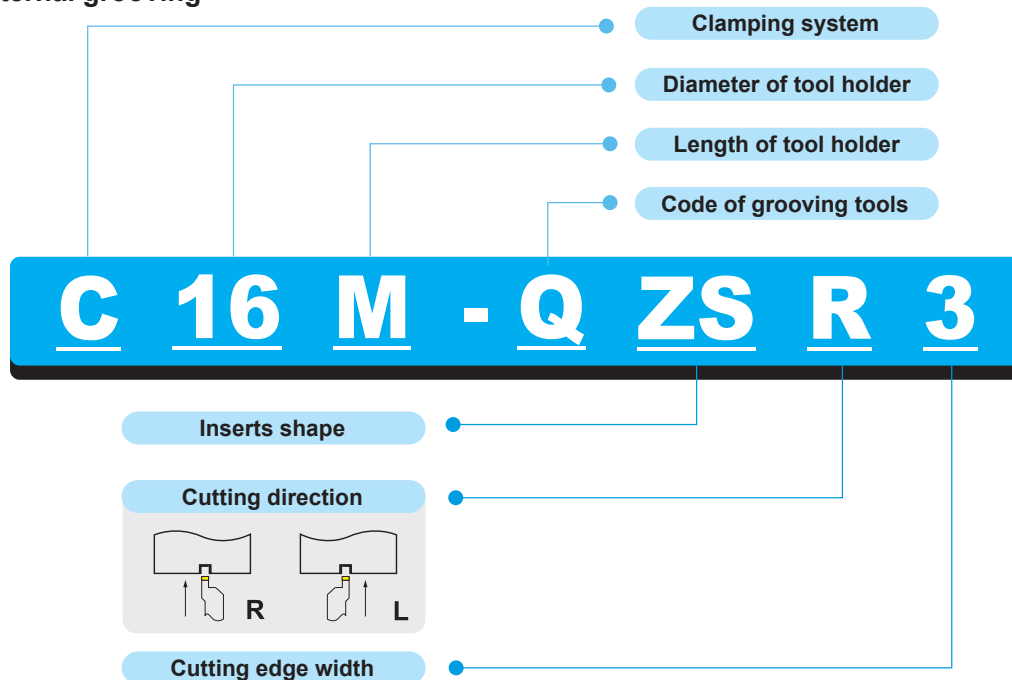
△Make-to-order

Parting and grooving tools code key

● External grooving



● Internal grooving

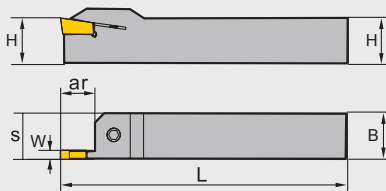




External parting and grooving tools: QZQ series



R-type shown



Type		Stock		Basic dimensions(mm)						Applicable inserts	Screw	Wrench
		R	L	H	B	L	S	W	ar _{max}			
QZQ	1616R/L03	▲	▲	16	16	100	16.4	3	16	ZQMX3N11-IE	GB70-85-M5×16	WH40L
	1616R/L04	▲	▲	16	16	100	16.4	4	18	ZQMX4N11-IE		
	2020R/L03	▲	▲	20	20	125	20.4	3	20	ZQMX3N11-IE		
	2020R/L04	▲	▲	20	20	125	20.4	4	20	ZQMX4N11-IE		
	2525R/L03	▲	▲	25	25	150	25.4	3	20	ZQMX3N11-IE	GB70-85-M6×20	WH50L
	2525R/L04	▲	▲	25	25	150	25.4	4	20	ZQMX4N11-IE		
	2525R/L05	▲	▲	25	25	150	25.4	5	25	ZQMX5N11-IE		
	2525R/L06	▲	▲	25	25	150	25.7	6	32	ZQMX6N11-IE		
	3225R/L03	▲	▲	32	25	170	25.4	3	25	ZQMX3N11-IE		
	3225R/L04	▲	▲	32	25	170	25.4	4	25	ZQMX4N11-IE		
	3225R/L05	▲	▲	32	25	170	25.4	5	25	ZQMX5N11-IE		
	3225R/L06	▲	▲	32	25	170	25.7	6	35	ZQMX6N11-IE		

▲ Stock available

△ Make-to-order

General turning

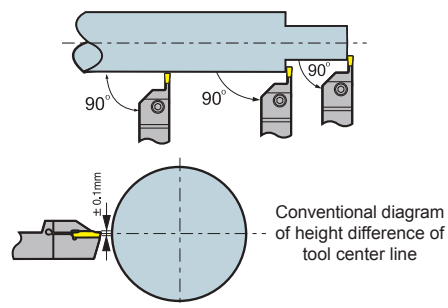
Parting and grooving

Supplementary series parting and grooving inserts



Center height control of parting and grooving tools

- No matter which parting or grooving tools you select, the ideal surface quality is only achieved by ensuring that insert is vertical from the center line of workpiece, which can also effectively reduce vibration during machining.
- The height tolerance between insert edge bottom and the center height of workpiece should be remained in $\pm 0.1\text{mm}$, especially for lever parting and grooving workpieces with small diameter. This can improve tool life, reduce cutting resistant force, and diminish burrs.

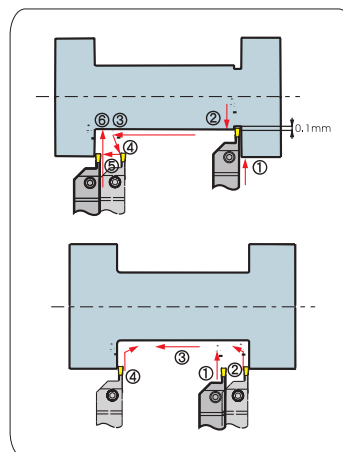


Parting

- When the insert is approaching the center of workpiece, the cutting speed should be reduced by 30%, which is good for improving life and surface quality.
- As long as conditions allow, try to shorten the overhang of tools as much as possible to ensure good stability.

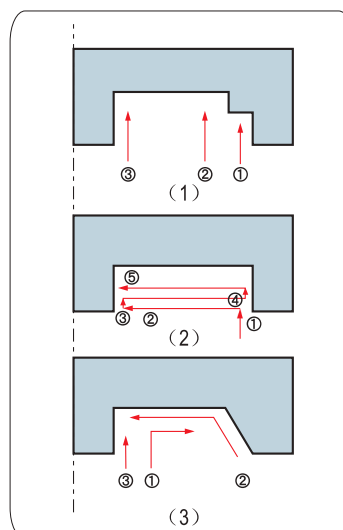
External grooving, turning and profiling

- In-feed sequence: When cutting depth $> 0.5\text{mm}$, radial in-feed (Max. cutting depth can be $0.75 \times \text{insert edge width } S$) → radial out-feed about 0.1mm → axial in-feed → flank out-feed → axial in-feed → radial machining to required depth.
- When finishing, adopt the sequence shown in the diagram. It can reduce vibration caused by the friction between tools and chips.



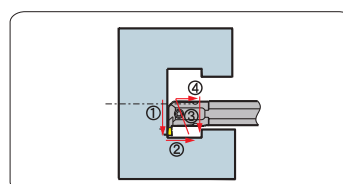
Surface grooving and turning

- Finishing (Multi-slot cutting)
Cut inwards from Max. diameter. Inserts offset to inward flange when retracting, as is shown in diagram (1).
- Recess turning
Axial turning depth should not exceed $0.75 \times S$ (cutting edge width).
If slot width is larger than slot depth, it is recommended to adopt recess turning, as is shown in diagram (2).
If slot depth is larger than slot depth, it is recommended to adopt multi-slot cutting.
- Finish machining
First finish bottom and external diameter fringe, then finish the internal diameter to required size, as is shown in diagram (3).



Internal grooving and turning

- To facilitate chip flow, always feed along the direction of moving from the deepest in the hole to outside.



General
turning

Parting and
grooving

Application information of
parting and grooving



TURNING Parting and grooving tools

Application information of parting and grooving

The cutting parameters recommended are suitable for wet machining.

Insert size	Recommended feed rate(mm/r)					
Insert width(mm)	Parting	Grooving	Grooving(-MM)	Turning	Turning(-MM)	Profiling
2.5	0.05-0.15	0.05-0.15	0.05-0.2	0.05-0.15	0.05-0.2	0.05-0.15
3	0.05-0.15	0.05-0.15	0.05-0.2	0.07-0.15	0.07-0.2	0.1-0.2
4	0.05-0.2	0.05-0.2	0.05-0.25	0.07-0.25	0.07-0.3	0.1-0.2
5	0.07-0.2	0.07-0.22	0.07-0.25	0.1-0.25	0.1-0.3	0.15-0.3
6	0.1-0.3	0.07-0.25	0.07-0.3	0.1-0.3	0.1-0.35	0.15-0.3
8			0.1-0.4		0.15-0.45	

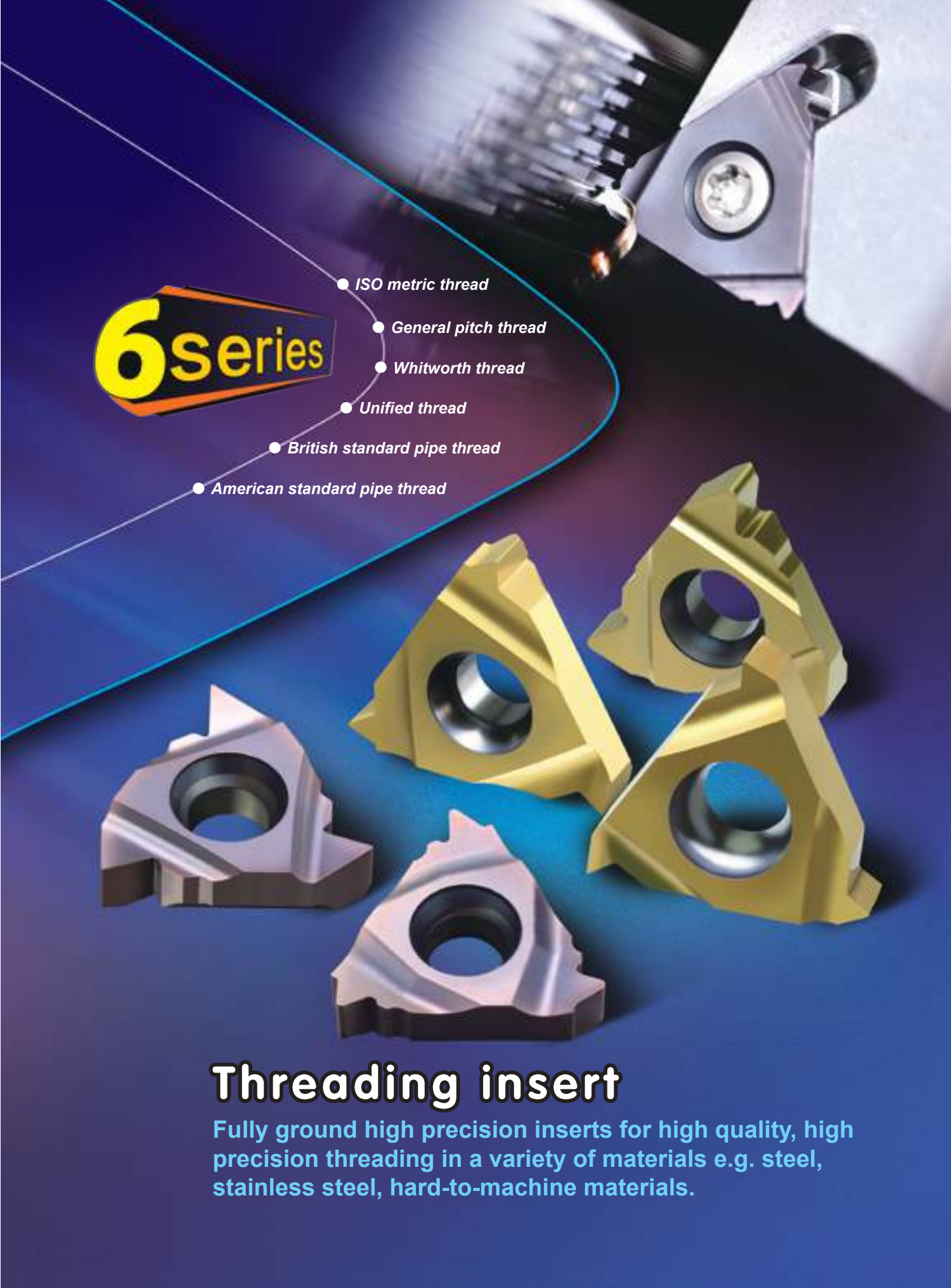
Workpiece material	Hardness	YBG302	YBG202 YBG205	YBG105	YBG212	YBC151	YBC251	YBS103	YD101	YD201	YBG102	YC10	YC40
P	Carbon steel	125≤HB≤170	120-260	150-280			140-280	150-280				130-280	110-260
	Low alloy steel	180≤HB≤275	80-175	110-200			100-240	110-200				90-200	70-175
	High alloy steel	180≤HB≤325	80-160	110-190			100-220	110-190				90-190	70-160
	Cast steel	180≤HB≤250	75-140	100-170			80-160	100-170				80-170	60-140
M	Ferrite, Martensite	200≤HB≤300	70-170	100-200			100-200					80-200	60-170
	Austenite	180≤HB≤300	80-200	110-220			110-220					90-220	70-200
K	Malleable cast iron	130≤HB≤230	100-200	130-220						90-160			
	Grey cast iron	180≤HB≤220	90-170	120-200						80-140			
	Nodular cast iron	160≤HB≤250	80-150	110-180						60-140			
N	Al alloy	--							200-400				
S	High temperature alloy	≤400			40-70	20-50		30-80	20-50		30-60		

The cutting parameters recommended are suitable for wet machining.

Advice: internal machining and end machining, The cutting speed should be reduced by 30%-40%.

●Recommended cutting parameters for QC series shallow groove tools

Processed material	Recommended insert material (cutting speed m/min)		A: Tool feed for grooving(mm/r)				
	PVD Coating		B: Tool feed for transverse machining(mm/r)				
	YBG202	YBG205	C: Depth of cut for transverse machining(mm)				
			QC**R/L050-120	QC**R/L125-225	QC**R/L230-325	QC**R/L330-400	QC**R/L400-480
Carbon Steel	80-180	80-180	A: 0.03-0.08	A: 0.04-0.09	A: 0.05-0.1	A: 0.05-0.12	A: 0.05-0.12
			Non-horizontal processing	B: 0.04-0.09	B: 0.05-0.1	B: 0.05-0.1	B: 0.05-1
			Non-horizontal processing	C: 0.3(MAX)	C: 0.5(MAX)	C: 0.5(MAX)	C: 0.8(MAX)
Alloy Steel	80-160	80-160	A: 0.03-0.07	A: 0.04-0.08	A: 0.05-0.09	A: 0.05-0.1	A: 0.05-0.1
			Non-horizontal processing	B: 0.04-0.08	B: 0.05-0.09	B: 0.05-0.1	B: 0.05-1
			Non-horizontal processing	C: 0.3(MAX)	C: 0.5(MAX)	C: 0.5(MAX)	C: 0.5(MAX)
Stainless Steel	60-130	60-130	A: 0.03-0.07	A: 0.04-0.08	A: 0.05-0.09	A: 0.05-0.1	A: 0.05-0.1
			Non-horizontal processing	B: 0.04-0.08	B: 0.05-0.09	B: 0.05-0.1	B: 0.05-1
			Non-horizontal processing	C: 0.3(MAX)	C: 0.5(MAX)	C: 0.5(MAX)	C: 0.5(MAX)
The cutting parameters above are applicable to external grooving. When machining internal hole grooves, please reduce the cutting speed and feed by 10%.							



6series

- *ISO metric thread*
- *General pitch thread*
- *Whitworth thread*
- *Unified thread*
- *British standard pipe thread*
- *American standard pipe thread*



Threading insert

Fully ground high precision inserts for high quality, high precision threading in a variety of materials e.g. steel, stainless steel, hard-to-machine materials.

TURNING Threading Tools

How to select threading tools

How to select threading tools

Structure of threading tools selected table

- Categorized as external threading and internal threading according to machining type.
- Separately listed out according to series.

Dimensions of product

Indicating external threading or internal threading

External threading tools

Threading insert type Including type, standard, tolerance class

Diagram of thread pitch

ISO metric thread (with end)

ISO 965-1980 DIN 13
GB/T 197-2003 Tolerance class: 6g/6H

R type shown

R type L type

Product specification Including type (right hand and left hand), basic dimensions, applicable inserts, spare parts

Product specification Including type (right hand and left hand), basic dimensions, stock

Dimension diagram of insert

Type	Stock	Basic dimensions(mm)					Applicable inserts	Inserts screw	Shim	Shim screw	Wrench
		a	h	b	L	s					
1616H16	▲	16	16	16	100	20	Z16ERC□□□□	80 M3.5X12TT	MT16-□□MN	SM4X8C	WT15P
2020K16	▲	20	20	20	125	25					
2525M16	▲	25	25	25	150	32					
3232P16	▲	32	32	25	170	32					
3232P16	▲	32	32	32	170	40	Z22ERC□□□□	80 M5X17	MT22-□□MN	SM5X8.5	WT20P
2525M22	▲	25	25	25	150	32					
3232P22	▲	32	32	25	170	32					
3232P22	▲	32	32	32	170	40					
4040S22	△	40	40	40	250	50	Z16EL□□□□	80 M3.5X12TT	MT16-□□MN	SM4X8C	WT15P
1616H16	▲	16	16	16	100	20					
2020K16	▲	20	20	20	125	25					
2525M16	▲	25	25	25	150	32					
3232P16	▲	32	32	25	170	32	Z22EL□□□□	80 M5X17	MT22-□□MN	SM5X8.5	WT20P
3232P16	▲	32	32	32	170	40					
2525M22	▲	25	25	25	150	32					
3232P22	▲	32	32	25	170	32					
3232P22	▲	32	32	32	170	40	Z22ER6.0ISO	80 M5X17	MT22-□□MN	SM5X8.5	WT20P
4040S22	△	40	40	40	250	50					

▲ Stock available △ Make-to-order

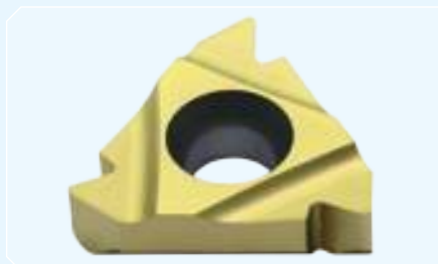
Type	Basic dimensions(mm)		Pitch	S	ØL/C	ed	Recommended coating grade
	The right hand tools	The left hand tools					
Z16ER0.5ISO	Z16EL0.5ISO	0.50	3.52	9.525	4.0	★	○
Z16ER0.75ISO	Z16EL0.75ISO	0.75	3.52	9.525	4.0	★	○
Z16ER1.0ISO	Z16EL1.0ISO	1.00	3.52	9.525	4.0	★	○
Z16ER1.25ISO	Z16EL1.25ISO	1.25	3.52	9.525	4.0	★	○
Z16ER1.5ISO	Z16EL1.5ISO	1.50	3.52	9.525	4.0	★	○
Z16ER1.75ISO	Z16EL1.75ISO	1.75	3.52	9.525	4.0	★	○
Z16ER2.0ISO	Z16EL2.0ISO	2.00	3.52	9.525	4.0	★	○
Z16ER2.5ISO	Z16EL2.5ISO	2.50	3.52	9.525	4.0	★	○
Z16ER3.0ISO	Z16EL3.0ISO	3.00	3.52	9.525	4.0	★	○
Z22ER3.5ISO	Z22EL3.5ISO	3.50	4.65	12.7	5.0	★	○
Z22ER4.0ISO	Z22EL4.0ISO	4.00	4.65	12.7	5.0	★	○
Z22ER4.5ISO	Z22EL4.5ISO	4.50	4.65	12.7	5.0	★	○
Z22ER5.0ISO	Z22EL5.0ISO	5.00	4.65	12.7	5.0	★	○
Z22ER5.5ISO	Z22EL5.5ISO	5.50	4.65	12.7	5.0	★	○
Z22ER6.0ISO	Z22EL6.0ISO	6.00	4.65	12.7	5.0	★	○

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



TURNING

Threading Tools



Threading tools overview	A294-A295
Introduction on threading insert grade and chipbreaker	A296
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Threading tools code key	A312
External threading tools	A313
Internal threading tools	A314
Application information on threading	A315-A325



TURNING Threading Tools

Threading tools overview

General
turning

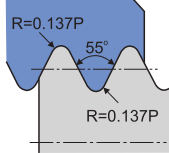
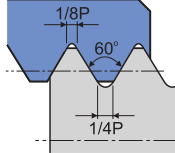
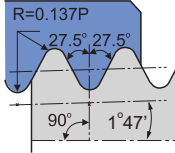
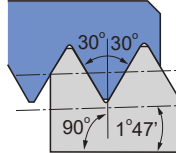
Parting and
grooving

Threading

Threading tools overview

Applications			For general use		
Legend					
Thread name			ISO metric thread With end	General pitch thread Without end	General pitch thread Without end
Profil			GM	60	55
Shape of insert (length: 11, 16, 22mm)			R style shown A298-299	R style shown A300	R style shown A300
Tool holder	Pitch	Dimensions (mm) (H×W×L) (Dia×L×Min. dia)	Pitch/mm	Pitch/mm (pitch/Inch)	Pitch/mm (pitch/Inch)
External thread	 R-type shown A313	16×16×100 20×20×125 25×25×150 32×25×170 32×32×170 40×40×250	0.5~6.0	0.5~5.0 (5~48)	0.5~5.0 (5~48)
Internal thread	 R-type shown A314	16×125×12 16×150×16 16×150×20 20×150×25 20×180×25 25×150×32 32×200×40 32×250×40 40×300×50 50×350×63	0.5~6.0	0.5~5.0 (5~48)	0.5~5.0 (5~48)



For general use	For aerospace industry	Heater, gas and water pipe thread	For gas and water faucet and pipe connection
			
Whitworth thread	Unified thread (American standard threads)	British standard taper pipe threads	American standard taper pipe threads
W	UN	BSPT	NPT
R style shown  A301	R style shown  A302	R style shown  A303	R style shown  A304
Pitch/mm (pitch/Inch)	Pitch/mm (pitch/Inch)	Pitch/mm (pitch/Inch)	Pitch/mm (pitch/Inch)
8~19	8~24	11~28	8~27
8~19	8~24	11~28	8~27

General turning

Parting and grooving

Threading

Threading tools overview

YBG203

New nano coating grade

suitable for threading in a variety of materials

- Specially treated edge for superior surface quality
- Sharp nose with small cutting resistance and superior performance
- Full ground inserts with high dimensional precision for high quality threading

Thread type	Grade of tolerance
ISO metric thread	6g/6H
Whitworth thread W	Medium Class A
British standard pipe thread	Standard BSPT
Unified thread	2A/2B
American standard pipe thread	Standard NPT

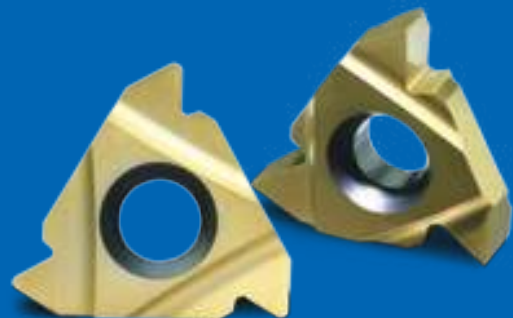
- New nano coating grade specially designed for threading with longer insert life



Advanced surface treatment techniques effectively reduce friction and allows for better wear observation.

Advanced TiAlN substrate nano coating, in combination with proper coating ingredients, improves the mechanical and thermal properties of coating.

Further optimizing coating structure, improving coating stress, enhancing bond strength of coating and substrate.



A 296

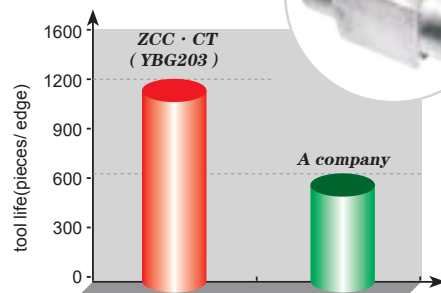
Case:

Workpiece material: 42CrMo(HB260)

Insert: Z16ER2.0ISO/YBG203

Thread pitch: $p=2.0\text{mm}$

Cutting data: $V_c=120\text{ m/min}$



84% tool life improvement of ZCC-CT product than that of company A under the same cutting condition.



Threading inserts code key

Insert size

Code	Diameter of IC(mm)
Z11	ø6.35
Z16	ø9.525
Z22	ø12.7

Cutting style

E -External threading inserts
I -Internal threading inserts

Cutting direction

R-Right
L-Left

Z16 E R 2.0 ISO (PP)

Screw pitch

Full profile (Range of screw pitch is indicated by numbers).

mm	TPI
0.5-6.0	48-5

V profile (Range of screw pitch is indicated by letters).

	mm	TPI
A	0.5-1.5	48-16
AG	0.5-3.0	48-8
G	1.75-3.0	14-8
N	3.5-5.0	7-5

Thread specification	Range of thread pitch
ISO metric thread	0.5-6.0
General pitch thread	0.5-5.0
Whitworth thread W	8-19
British standard pipe thread	11-28
Unified thread	8-24
American standard pipe thread	8-27

Profile

ISO—ISO metric 60° thread
60—60° general pitch thread
55—55° general pitch thread
W—Whitworth thread
UN—Unified thread(American standard threads)
BSPT—British standard taper pipe thread
NPT—American standard taper pipe thread

Chip breaker

□—fully ground edge insert
PP —3-Dimensional chip-breaking insert

General turning

Parting and grooving

Threading

Threading insert

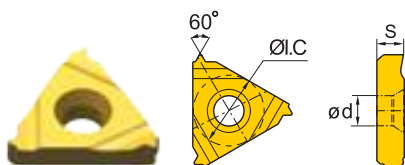
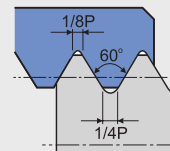


TURNING Threading Tools

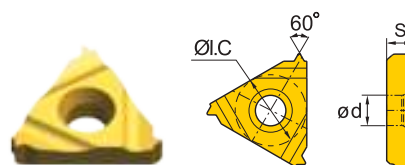
Threading insert

ISO metric thread (with end)

ISO 965-1980 DIN 13
GB/T 197-2003 Tolerance class: 6g/6H



R type



L type

	Type		Basic dimensions(mm)				Recommended coating grade	
	The right hand tools	The left hand tools	Pitch	S	ØI.C	ød	YBG203	YBG205
External thread	Z16ER0.5ISO	Z16EL0.5ISO	0.50	3.52	9.525	4.0	★	○
	Z16ER0.75ISO	Z16EL0.75ISO	0.75	3.52	9.525	4.0	★	○
	Z16ER1.0ISO	Z16EL1.0ISO	1.00	3.52	9.525	4.0	★	○
	Z16ER1.25ISO	Z16EL1.25ISO	1.25	3.52	9.525	4.0	★	○
	Z16ER1.5ISO	Z16EL1.5ISO	1.50	3.52	9.525	4.0	★	○
	Z16ER1.75ISO	Z16EL1.75ISO	1.75	3.52	9.525	4.0	★	○
	Z16ER2.0ISO	Z16EL2.0ISO	2.00	3.52	9.525	4.0	★	○
	Z16ER2.5ISO	Z16EL2.5ISO	2.50	3.52	9.525	4.0	★	○
	Z16ER3.0ISO	Z16EL3.0ISO	3.00	3.52	9.525	4.0	★	○
	Z22ER3.5ISO	Z22EL3.5ISO	3.50	4.65	12.7	5.0	★	○
	Z22ER4.0ISO	Z22EL4.0ISO	4.00	4.65	12.7	5.0	★	○
	Z22ER4.5ISO	Z22EL4.5ISO	4.50	4.65	12.7	5.0	★	○
	Z22ER5.0ISO	Z22EL5.0ISO	5.00	4.65	12.7	5.0	★	○
	Z22ER5.5ISO	Z22EL5.5ISO	5.50	4.65	12.7	5.0	★	○
	Z22ER6.0ISO	Z22EL6.0ISO	6.00	4.65	12.7	5.0	★	○

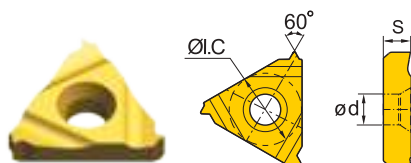
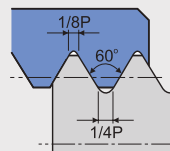
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order



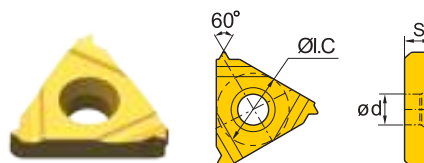


ISO metric thread (with end)

ISO 965-1980 DIN 13
GB/T 197-2003 Tolerance class: 6g/6H



R type



L type

	Type		Basic dimensions(mm)				Recommended coating grade	
	The right hand tools	The left hand tools	Pitch	S	ØI.C	Ød	YBG203	YBG205
Internal thread	Z11IR0.5ISO	Z11IL0.5ISO	0.50	3.05	6.35	3.2	★	○
	Z11IR0.75ISO	Z11IL0.75ISO	0.75	3.05	6.35	3.2	★	○
	Z11IR1.0ISO	Z11IL1.0ISO	1.00	3.05	6.35	3.2	★	○
	Z11IR1.25ISO	Z11IL1.25ISO	1.25	3.05	6.35	3.2	★	○
	Z11IR1.5ISO	Z11IL1.5ISO	1.50	3.05	6.35	3.2	★	○
	Z11IR1.75ISO	Z11IL1.75ISO	1.75	3.05	6.35	3.2	★	○
	Z11IR2.0ISO	Z11IL2.0ISO	2.00	3.05	6.35	3.2	★	○
	Z16IR0.5ISO	Z16IL0.5ISO	0.50	3.52	9.525	4.0	★	○
	Z16IR0.75ISO	Z16IL0.75ISO	0.75	3.52	9.525	4.0	★	○
	Z16IR1.0ISO	Z16IL1.0ISO	1.00	3.52	9.525	4.0	★	○
	Z16IR1.25ISO	Z16IL1.25ISO	1.25	3.52	9.525	4.0	★	○
	Z16IR1.5ISO	Z16IL1.5ISO	1.50	3.52	9.525	4.0	★	○
	Z16IR1.75ISO	Z16IL1.75ISO	1.75	3.52	9.525	4.0	★	○
	Z16IR2.0ISO	Z16IL2.0ISO	2.00	3.52	9.525	4.0	★	○
	Z16IR2.5ISO	Z16IL2.5ISO	2.50	3.52	9.525	4.0	★	○
	Z16IR3.0ISO	Z16IL3.0ISO	3.00	3.52	9.525	4.0	★	○
	Z22IR3.5ISO	Z22IL3.5ISO	3.50	4.65	12.7	5.0	★	○
	Z22IR4.0ISO	Z22IL4.0ISO	4.00	4.65	12.7	5.0	★	○
	Z22IR4.5ISO	Z22IL4.5ISO	4.50	4.65	12.7	5.0	★	○
	Z22IR5.0ISO	Z22IL5.0ISO	5.00	4.65	12.7	5.0	★	○
	Z22IR5.5ISO	Z22IL5.5ISO	5.50	4.65	12.7	5.0	★	○
	Z22IR6.0ISO	Z22IL6.0ISO	6.00	4.65	12.7	5.0	★	○

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

General turning

Parting and grooving

Threading

Threading insert



TURNING Threading Tools

Threading insert

General pitch thread (without end)



		Type		Basic dimensions(mm)					Recommended coating grade	
		The right hand tools	The left hand tools	Pitch/mm (pitch/Inch)	S	ØI.C	ød	α°	YBG203	YBG205
External thread	55°	Z16ERA55	Z16ELA55	0.5-1.5(48-16)	3.52	9.525	4.0	55°	★	○
		Z16ERG55	Z16ELG55	1.75-3.0(14-8)	3.52	9.525	4.0	55°	★	○
		Z16ERAG55	Z16ELAG55	0.5-3.0(48-8)	3.52	9.525	4.0	55°	★	○
		Z22ERN55	Z22ELN55	3.5-5.0(7-5)	4.65	12.7	5.0	55°	★	○
	60°	Z16ERA60	Z16ELA60	0.5-1.5(48-16)	3.52	9.525	4.0	60°	★	○
		Z16ERG60	Z16ELG60	1.75-3.0(14-8)	3.52	9.525	4.0	60°	★	○
		Z16ERAG60	Z16ELAG60	0.5-3.0(48-8)	3.52	9.525	4.0	60°	★	○
		Z22ERN60	Z22ELN60	3.5-5.0(7-5)	4.65	12.7	5.0	60°	★	○

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

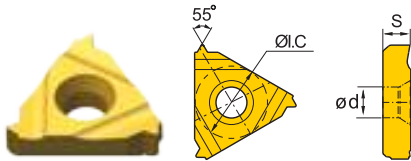
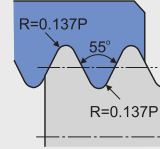


		Type		Basic dimensions(mm)					Recommended coating grade	
		The right hand tools	The left hand tools	Pitch/mm (pitch/Inch)	S	ØI.C	ød	α°	YBG203	YBG205
Internal thread	55°	Z11IRA55	Z11ILA55	0.5-1.5(48-16)	3.05	6.35	3.2	55°	★	○
		Z16IRA55	Z16ILA55	0.5-1.5(48-16)	3.52	9.525	4.0	55°	★	○
		Z16IRG55	Z16ILG55	1.75-3.0(14-8)	3.52	9.525	4.0	55°	★	○
		Z16IRAG55	Z16ILAG55	0.5-3.0(48-8)	3.52	9.525	4.0	55°	★	○
		Z22IRN55	Z22ILN55	3.5-5.0(7-5)	4.65	12.7	5.0	55°	★	○
	60°	Z11IRA60	Z11ILA60	0.5-1.5(48-16)	3.05	6.35	3.2	60°	★	○
		Z16IRA60	Z16ILA60	0.5-1.5(48-16)	3.52	9.525	4.0	60°	★	○
		Z16IRG60	Z16ILG60	1.75-3.0(14-8)	3.52	9.525	4.0	60°	★	○
		Z16IRAG60	Z16ILAG60	0.5-3.0(48-8)	3.52	9.525	4.0	60°	★	○
		Z22IRN60	Z22ILN60	3.5-5.0(7-5)	4.65	12.7	5.0	60°	★	○

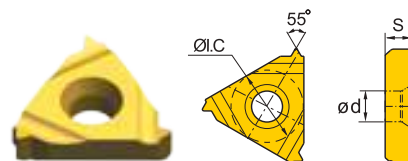
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Whitworth thread (with end)

ISO 228/1:1982,
DIN 259, B.S.84:1956
Tolerance class: Medium class A



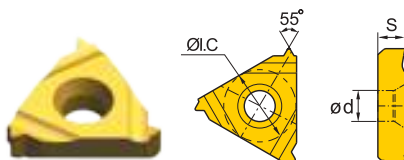
R type



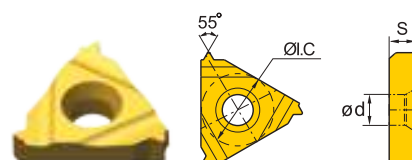
L type

	Type		Basic dimensions(mm)				Recommended coating grade	
	The right hand tools	The left hand tools	Pitch/mm (pitch/Inch)	S	ØI.C	ød	YBG203	YBG205
External thread	Z16ER8W	Z16EL8W	8	3.52	9.525	4.0	★	○
	Z16ER9W	Z16EL9W	9	3.52	9.525	4.0	★	○
	Z16ER10W	Z16EL10W	10	3.52	9.525	4.0	★	○
	Z16ER11W	Z16EL11W	11	3.52	9.525	4.0	★	○
	Z16ER12W	Z16EL12W	12	3.52	9.525	4.0	★	○
	Z16ER14W	Z16EL14W	14	3.52	9.525	4.0	★	○
	Z16ER16W	Z16EL16W	16	3.52	9.525	4.0	★	○
	Z16ER18W	Z16EL18W	18	3.52	9.525	4.0	★	○
	Z16ER19W	Z16EL19W	19	3.52	9.525	4.0	★	○

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



R type



L type

	Type		Basic dimensions(mm)				Recommended coating grade	
	The right hand tools	The left hand tools	Pitch/mm (pitch/Inch)	S	ØI.C	ød	YBG203	YBG205
Internal thread	Z16IR8W	Z16IL8W	8	3.52	9.525	4.0	★	○
	Z16IR9W	Z16IL9W	9	3.52	9.525	4.0	★	○
	Z16IR10W	Z16IL10W	10	3.52	9.525	4.0	★	○
	Z16IR11W	Z16IL11W	11	3.52	9.525	4.0	★	○
	Z16IR12W	Z16IL12W	12	3.52	9.525	4.0	★	○
	Z16IR14W	Z16IL14W	14	3.52	9.525	4.0	★	○
	Z16IR16W	Z16IL16W	16	3.52	9.525	4.0	★	○
	Z16IR18W	Z16IL18W	18	3.52	9.525	4.0	★	○
	Z16IR19W	Z16IL19W	19	3.52	9.525	4.0	★	○

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

General turning

Parting and grooving

Threading

Threading insert

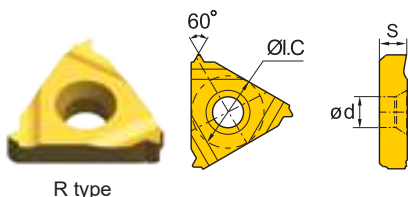
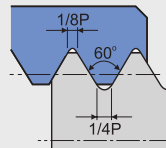


TURNING Threading Tools

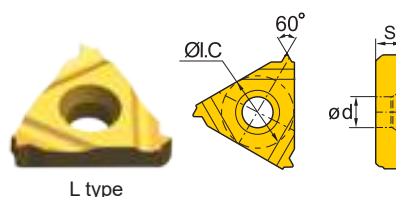
Threading insert

Unified thread (with end)

ASME B1.1-1989
Tolerance class: 2A/2B



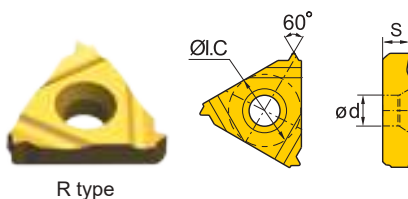
R type



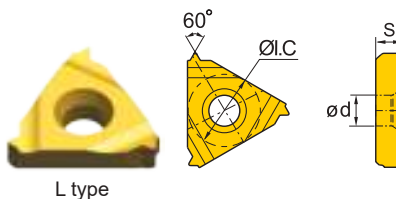
L type

	Type		Basic dimensions(mm)				Recommended coating grade	
	The right hand tools	The left hand tools	Pitch/mm (pitch/Inch)	S	ØI.C	ød	YBG203	YBG205
External thread	Z16ER8UN	Z16EL8UN	8	3.52	9.525	4.0	★	○
	Z16ER10UN	Z16EL10UN	10	3.52	9.525	4.0	★	○
	Z16ER12UN	Z16EL12UN	12	3.52	9.525	4.0	★	○
	Z16ER14UN	Z16EL14UN	14	3.52	9.525	4.0	★	○
	Z16ER16UN	Z16EL16UN	16	3.52	9.525	4.0	★	○
	Z16ER18UN	Z16EL18UN	18	3.52	9.525	4.0	★	○
	Z16ER20UN	Z16EL20UN	20	3.52	9.525	4.0	★	○
	Z16ER24UN	Z16EL24UN	24	3.52	9.525	4.0	★	○

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



R type



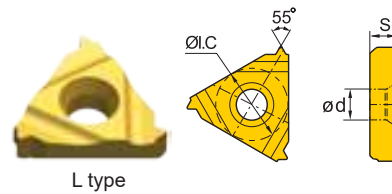
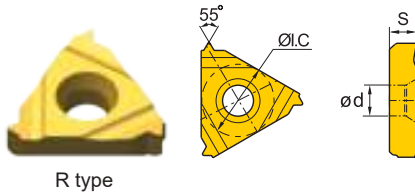
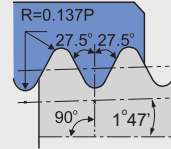
L type

	Type		Basic dimensions(mm)				Recommended coating grade	
	The right hand tools	The left hand tools	Pitch/mm (pitch/Inch)	S	ØI.C	ød	YBG203	YBG205
Internal thread	Z16IR8UN	Z16IL8UN	8	3.52	9.525	4.0	★	○
	Z16IR10UN	Z16IL10UN	10	3.52	9.525	4.0	★	○
	Z16IR12UN	Z16IL12UN	12	3.52	9.525	4.0	★	○
	Z16IR14UN	Z16IL14UN	14	3.52	9.525	4.0	★	○
	Z16IR16UN	Z16IL16UN	16	3.52	9.525	4.0	★	○
	Z16IR18UN	Z16IL18UN	18	3.52	9.525	4.0	★	○
	Z16IR20UN	Z16IL20UN	20	3.52	9.525	4.0	★	○
	Z16IR24UN	Z16IL24UN	24	3.52	9.525	4.0	★	○

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

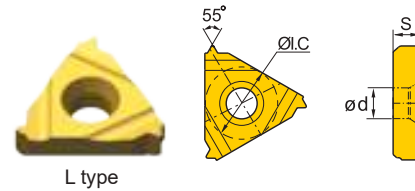
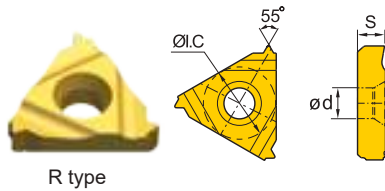
British standard taper pipe thread (with end)

ISO 7/1:1994
B.S.21:1985
Standard BSPT



	Type		Basic dimensions(mm)				Recommended coating grade	
	The right hand tools	The left hand tools	Pitch/mm (pitch/Inch)	S	ØI.C	ød	YBG203	YBG205
External thread	Z16ER11BSPT	Z16EL11BSPT	11	3.52	9.525	4.0	★	○
	Z16ER14BSPT	Z16EL14BSPT	14	3.52	9.525	4.0	★	○
	Z16ER19BSPT	Z16EL19BSPT	19	3.52	9.525	4.0	★	○
	Z16ER28BSPT	Z16EL28BSPT	28	3.52	9.525	4.0	★	○

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



	Type		Basic dimensions(mm)				Recommended coating grade	
	The right hand tools	The left hand tools	Pitch/mm (pitch/Inch)	S	ØI.C	ød	YBG203	YBG205
Internal thread	Z16IR11BSPT	Z16IL11BSPT	11	3.52	9.525	4.0	★	○
	Z16IR14BSPT	Z16IL14BSPT	14	3.52	9.525	4.0	★	○
	Z16IR19BSPT	Z16IL19BSPT	19	3.52	9.525	4.0	★	○
	Z16IR28BSPT	Z16IL28BSPT	28	3.52	9.525	4.0	★	○

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

General turning

Parting and grooving

Threading

Threading insert



TURNING Threading Tools

Threading insert

General turning

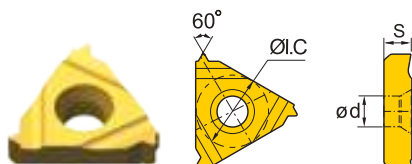
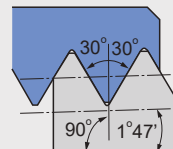
Parting and grooving

Threading

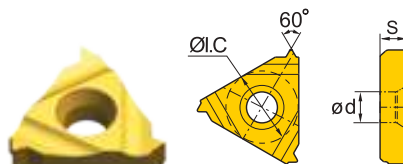
Threading insert

American standard taper piper thread (with end)

ASME B1.20.1-1983
Standard NPT



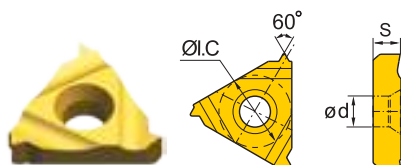
R type



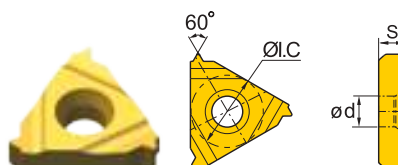
L type

	Type		Basic dimensions(mm)				Recommended coating grade	
	The right hand tools	The left hand tools	Pitch/mm (pitch/Inch)	S	ØI.C	ød	YBG203	YBG205
External thread	Z16ER8NPT	Z16EL8NPT	8	3.52	9.525	4.0	★	○
	Z16ER11.5NPT	Z16EL11.5NPT	11.5	3.52	9.525	4.0	★	○
	Z16ER14NPT	Z16EL14NPT	14	3.52	9.525	4.0	★	○
	Z16ER18NPT	Z16EL18NPT	18	3.52	9.525	4.0	★	○
	Z16ER27NPT	Z16EL27NPT	27	3.52	9.525	4.0	★	○

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



R type



L type

	Type		Basic dimensions(mm)				Recommended coating grade	
	The right hand tools	The left hand tools	Pitch/mm (pitch/Inch)	S	ØI.C	ød	YBG203	YBG205
Internal thread	Z16IR8NPT	Z16IL8NPT	8	3.52	9.525	4.0	★	○
	Z16IR11.5NPT	Z16IL11.5NPT	11.5	3.52	9.525	4.0	★	○
	Z16IR14NPT	Z16IL14NPT	14	3.52	9.525	4.0	★	○
	Z16IR18NPT	Z16IL18NPT	18	3.52	9.525	4.0	★	○
	Z16IR27NPT	Z16IL27NPT	27	3.52	9.525	4.0	★	○

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



Threading inserts code key

Cutting direction

R ▶ Right rotation **L** ▶ Left rotation

Insert shape



T

Other

Z

- 22** ▶ Indicates that the inner cutting circle diameter of the blade is 12.7
- 16** ▶ Indicates that the inner cutting circle diameter of the blade is 9.525
- 11** ▶ Indicates that the inner cutting circle diameter of the blade is 6.35

Number of cutting edge teeth

01 ▶ Number of teeth per cutting edge

Cutting Type

W ▶ External thread cutting inserts

N ▶ Internal thread cutting inserts

R T 16. 01 W- 3.00 GM (B)

Pitch

Full tooth shape
(pitch range is indicated by numbers)

mm	TPI
0.35-9.0	72-2

V-tooth
(pitch range is indicated by letter)

	mm	TPI
A	0.5-1.5	48-16
AG	0.5-3.0	48-8
G	1.75-3.0	14-8
N	3.5-5.0	7-5
Q	5.5-6.0	4 1/2-4

Threaded tooth shape

GM	ISO metric 60° thread
60	60° general pitch thread
55	55° general pitch thread
W	Whitworth thread
UN	Unified thread
BSPT	British standard pipe thread
NPT	American standard pipe thread

Supplementary number

B ▶ Thin Threaded Inserts

General turning

Parting and grooving

Threading

Threading tools



TURNING Threading Tools

Threading tools

General
turning

Parting and
grooving

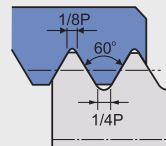
Threading

Threading tools

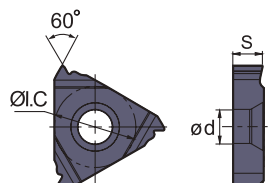
ISO metric thread (with end) **Thin type**

ISO 965-1980, DIN 13, GB/T 197-2003

Tolerance class: 6g/6H



R type

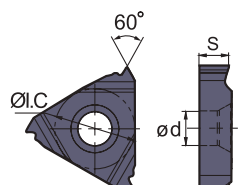


	Type	Basic dimensions(mm)				Recommended coating grade
	The right hand tools	Pitch/mm	S	ØI.C	ød	YBG202
External thread	RT16.01W-0.50GMB	0.50	3.52	9.525	4.0	★
	RT16.01W-0.75GMB	0.75	3.52	9.525	4.0	★
	RT16.01W-1.00GMB	1.00	3.52	9.525	4.0	★
	RT16.01W-1.25GMB	1.25	3.52	9.525	4.0	★
	RT16.01W-1.50GMB	1.50	3.52	9.525	4.0	★
	RT16.01W-1.75GMB	1.75	3.52	9.525	4.0	★
	RT16.01W-2.00GMB	2.00	3.52	9.525	4.0	★
	RT16.01W-2.50GMB	2.50	3.52	9.525	4.0	★
	RT16.01W-3.00GMB	3.00	3.52	9.525	4.0	★

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



R type



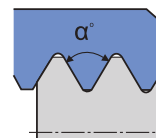
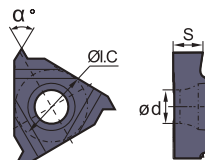
	Type	Basic dimensions(mm)				Recommended coating grade
	The right hand tools	Pitch/mm	S	ØI.C	ød	YBG202
Internal thread	RT16.01N-0.50GMB	0.50	3.52	9.525	4.0	★
	RT16.01N-0.75GMB	0.75	3.52	9.525	4.0	★
	RT16.01N-1.00GMB	1.00	3.52	9.525	4.0	★
	RT16.01N-1.25GMB	1.25	3.52	9.525	4.0	★
	RT16.01N-1.50GMB	1.50	3.52	9.525	4.0	★
	RT16.01N-1.75GMB	1.75	3.52	9.525	4.0	★
	RT16.01N-2.00GMB	2.00	3.52	9.525	4.0	★
	RT16.01N-2.50GMB	2.50	3.52	9.525	4.0	★
	RT16.01N-3.00GMB	3.00	3.52	9.525	4.0	★

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

General pitch thread (without end) Thin type



R type

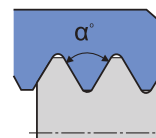
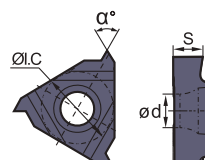


		Type	Basic dimensions(mm)					Recommended coating grade
		The right hand tools	Pitch/mm (pitch/Inch)	S	ØI.C	ød	α°	YBG202
External thread	60°	RT16.01W-A60B	0.5-1.5(48-16)	3.52	9.525	4.0	60°	★
		RT16.01W-G60B	1.75-3.0(14-8)	3.52	9.525	4.0	60°	★
		RT16.01W-AG60B	0.5-3.0(48-8)	3.52	9.525	4.0	60°	★
	55°	RT16.01W-A55B	0.5-1.5(48-16)	3.52	9.525	4.0	55°	★
		RT16.01W-G55B	1.75-3.0(14-8)	3.52	9.525	4.0	55°	★
		RT16.01W-AG55B	0.5-3.0(48-8)	3.52	9.525	4.0	55°	★

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



R type



		Type	Basic dimensions(mm)					Recommended coating grade
		The right hand tools	Pitch/mm (pitch/Inch)	S	ØI.C	ød	α°	YBG202
Internal thread	60°	RT16.01N-A60B	0.5-1.5(48-16)	3.52	9.525	4.0	60°	★
		RT16.01N-G60B	1.75-3.0(14-8)	3.52	9.525	4.0	60°	★
		RT16.01N-AG60B	0.5-3.0(48-8)	3.52	9.525	4.0	60°	★
	55°	RT16.01N-A55B	0.5-1.5(48-16)	3.52	9.525	4.0	55°	★
		RT16.01N-G55B	1.75-3.0(14-8)	3.52	9.525	4.0	55°	★
		RT16.01N-AG55B	0.5-3.0(48-8)	3.52	9.525	4.0	55°	★

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

General turning

Parting and grooving

Threading

Threading tools



TURNING Threading Tools

Threading tools

General turning

Parting and grooving

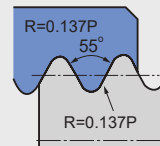
Threading

Threading tools

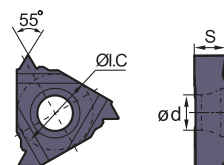
Whitworth thread (with end) **Thin type**

ISO 228/1:1982,DIN 259,B.S.84:1956

Tolerance class: Medium class A



R type

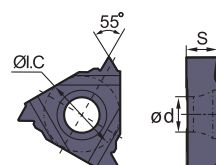


	Type	Basic dimensions(mm)				Recommended coating grade
	The right hand tools	Pitch/mm (pitch/Inch)	S	ØI.C	ød	YBG202
External thread	RT16.01W-8WB	8	3.52	9.525	4.0	★
	RT16.01W-9WB	9	3.52	9.525	4.0	★
	RT16.01W-10WB	10	3.52	9.525	4.0	★
	RT16.01W-11WB	11	3.52	9.525	4.0	★
	RT16.01W-12WB	12	3.52	9.525	4.0	★
	RT16.01W-14WB	14	3.52	9.525	4.0	★
	RT16.01W-16WB	16	3.52	9.525	4.0	★

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



R type



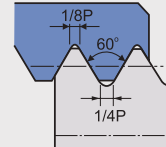
	Type	Basic dimensions(mm)				Recommended coating grade
	The right hand tools	Pitch/mm (pitch/Inch)	S	ØI.C	ød	YBG202
Internal thread	RT16.01N-8WB	8	3.52	9.525	4.0	★
	RT16.01N-9WB	9	3.52	9.525	4.0	★
	RT16.01N-10WB	10	3.52	9.525	4.0	★
	RT16.01N-11WB	11	3.52	9.525	4.0	★
	RT16.01N-12WB	12	3.52	9.525	4.0	★
	RT16.01N-14WB	14	3.52	9.525	4.0	★
	RT16.01N-16WB	16	3.52	9.525	4.0	★

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

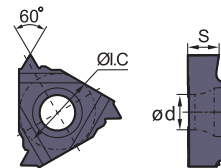
Unified thread (with end) **Thin type**

ASME B1.1-1989

Tolerance class: 2A/2B



R type

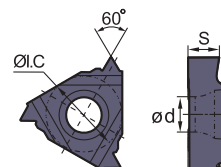


	Type	Basic dimensions(mm)				Recommended coating grade
	The right hand tools	Pitch/mm (pitch/Inch)	S	ØI.C	ød	YBG202
External thread	RT16.01W-8UNB	8	3.52	9.525	4.0	★
	RT16.01W-10UNB	10	3.52	9.525	4.0	★
	RT16.01W-12UNB	12	3.52	9.525	4.0	★
	RT16.01W-14UNB	14	3.52	9.525	4.0	★
	RT16.01W-16UNB	16	3.52	9.525	4.0	★
	RT16.01W-18UNB	18	3.52	9.525	4.0	★
	RT16.01W-20UNB	20	3.52	9.525	4.0	★

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



R type



	Type	Basic dimensions(mm)				Recommended coating grade
	The right hand tools	Pitch/mm (pitch/Inch)	S	ØI.C	ød	YBG202
Internal thread	RT16.01N-8UNB	8	3.52	9.525	4.0	★
	RT16.01N-10UNB	10	3.52	9.525	4.0	★
	RT16.01N-12UNB	12	3.52	9.525	4.0	★
	RT16.01N-14UNB	14	3.52	9.525	4.0	★
	RT16.01N-16UNB	16	3.52	9.525	4.0	★
	RT16.01N-18UNB	18	3.52	9.525	4.0	★
	RT16.01N-20UNB	20	3.52	9.525	4.0	★
	RT16.01N-24UNB	24	3.52	9.525	4.0	★

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

General turning

Parting and grooving

Threading

Threading tools



TURNING Threading Tools

Threading tools

General
turning

Parting and
grooving

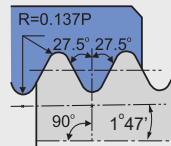
Threading

Threading tools

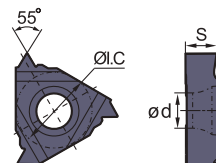
British standard taper piper thread (with end)

Thin type

ISO 7/1:1994,B.S.21:1985
Standard BSPT



R type

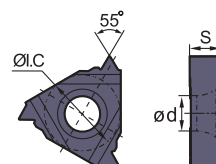


	Type	Basic dimensions(mm)				Recommended coating grade
	The right hand tools	Pitch/mm (pitch/Inch)	S	ØI.C	ød	YBG202
External thread	RT16.01W-11BSPTB	11	3.52	9.525	4.0	★
	RT16.01W-14BSPTB	14	3.52	9.525	4.0	★
	RT16.01W-19BSPTB	19	3.52	9.525	4.0	★
	RT16.01W-28BSPTB	28	3.52	9.525	4.0	★

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



R type

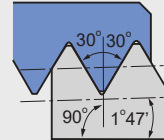


	Type	Basic dimensions(mm)				Recommended coating grade
	The right hand tools	Pitch/mm (pitch/Inch)	S	ØI.C	ød	YBG202
Internal thread	RT16.01N-11BSPTB	11	3.52	9.525	4.0	★
	RT16.01N-14BSPTB	14	3.52	9.525	4.0	★
	RT16.01N-19BSPTB	19	3.52	9.525	4.0	★
	RT16.01N-28BSPTB	28	3.52	9.525	4.0	★

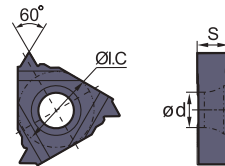
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

American standard taper pipe thread (with end) Thin type

ASME B1.20.1-1983
Standard NPT



R type

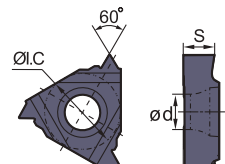


	Type	Basic dimensions(mm)				Recommended coating grade
	The right hand tools	Pitch/mm (pitch/Inch)	S	ØI.C	ød	YBG202
External thread	RT16.01W-8NPTB	8	3.52	9.525	4.0	★
	RT16.01W-11.5NPTB	11.5	3.52	9.525	4.0	★
	RT16.01W-14NPTB	14	3.52	9.525	4.0	★
	RT16.01W-18NPTB	18	3.52	9.525	4.0	★
	RT16.01W-27NPTB	27	3.52	9.525	4.0	★

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



R type



	Type	Basic dimensions(mm)				Recommended coating grade
	The right hand tools	Pitch/mm (pitch/Inch)	S	ØI.C	ød	YBG202
Internal thread	RT16.01N-8NPTB	8	3.52	9.525	4.0	★
	RT16.01N-11.5NPTB	11.5	3.52	9.525	4.0	★
	RT16.01N-14NPTB	14	3.52	9.525	4.0	★
	RT16.01N-18NPTB	18	3.52	9.525	4.0	★
	RT16.01N-27NPTB	27	3.52	9.525	4.0	★

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

General turning

Parting and grooving

Threading

Threading tools



TURNING Threading Tools

Threading tools

Threading tools code key

General turning

Parting and grooving

Threading

Threading tools

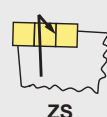
Clamping system

Top clamping

Screw clamping



ZC



ZS

Thread type

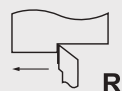
I Internal thread

E External thread

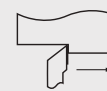
Cutting direction

Right hand

Left hand



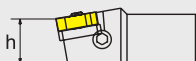
R



L

ZS E R 20 20 K 16

Nose height



Note: 00 for round tool holder.
Only to integer, for example:
h=8mm is labeled as 08.

Shank width



Note: Diameter for round tool holder
for example: b=8mm is labeled as 08.

Tool length

Code	H	K	M	P	Q	R	S	T	U
Length	100	125	150	170	180	200	250	300	350

Insert size

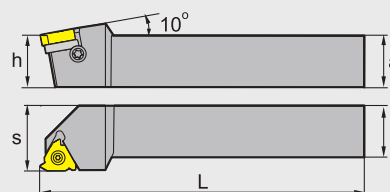
Code	11	16	22
Triangle side length	11	16	22
Inscribed circle	6.35	9.525	12.70



External threading tools



R-type shown



Type		Stock	Basic dimensions(mm)					Applicable inserts	Inserts screw	Shim	Shim screw	Wrench
			a	h	b	L	s					
ZSER	1616H16	▲	16	16	16	100	20	Z16ER□□□□	I60 M3.5×12TT	MT16-□□MN	SM4X8C	WT15IP
	2020K16	▲	20	20	20	125	25					
	2525M16	▲	25	25	25	150	32					
	3225P16	▲	32	32	25	170	32					
	3232P16	▲	32	32	32	170	40					
	2525M22	▲	25	25	25	150	32	Z22ER□□□□	I60 M4×15X	MT22-□□MN	SM5X8.5	WT20IP
	3225P22	▲	32	32	25	170	32					
	3232P22	▲	32	32	32	170	40					
	4040S22	△	40	40	40	250	50					
ZSEL	1616H16	▲	16	16	16	100	20	Z16EL□□□□	I60 M3.5×12TT	MT16-□□MN	SM4X8C	WT15IP
	2020K16	▲	20	20	20	125	25					
	2525M16	▲	25	25	25	150	32					
	3225P16	▲	32	32	25	170	32					
	3232P16	▲	32	32	32	170	40					
	2525M22	▲	25	25	25	150	32	Z22EL□□□□	I60 M4×15X	MT22-□□MN	SM5X8.5	WT20IP
	3225P22	▲	32	32	25	170	32					
	3232P22	▲	32	32	32	170	40					
	4040S22	△	40	40	40	250	50					

▲Stock available

△Make-to-order

General turning

Parting and grooving

Threading

Threading tools



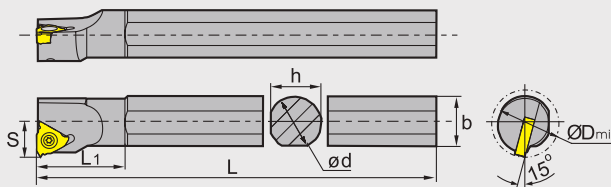
TURNING Threading Tools

Threading tools

Internal threading tools



R-type shown



Type		Stock	Basic dimensions(mm)							Applicable inserts	Inserts screw	Shim	Shim screw	Wrench		
			d	L	b	D _{min}	s	h	L ₁							
ZSIR	0016K11	▲	16	125	15.5	12	10	15	20.9	Z11IR□□□□	I60 M2.5X6.5T	---	---	WT08IP		
	0016M11	▲	16	150	16	16	10.5	15	25.9		Z16IR□□□□	I60 M3.5X08TT	---	---	WT15IP	
	0016M16	▲	16	150	15.5	20	12	15	27	I60 M3.5X12TT		MT16-□□MN	SM4X8C			
	0020M16	▲	20	150	19	25	14	18	28.7							
	0020Q16	▲	20	180	19	25	14	18	34							
	0025M16	▲	25	150	24	32	17	23	28.8							
	0032R16	▲	32	200	31	40	22	30	30.9							
	0032S16	▲	32	250	31	40	22	30	30.9							
	0040T16	▲	40	300	38.5	50	27	37	31.5	Z22IR□□□□		I60 M5×13.2	---	---		WT20IP
	0050U16	▲	50	350	48.5	63	35	49	40.2							
	0020Q22	▲	20	180	19	25	15	18	35							
	0025R22	▲	25	200	24	32	19	23	39	I60 M4×15X	MT22-□□MN	SM5X8.5				
	0032S22	▲	32	250	31	40	22	30	36.4							
	0040T22	▲	40	300	38.5	50	27	37	37.2							
	0050U22	▲	50	350	48.5	63	35	47	42.6							
ZSIL	0016K11	▲	16	125	15.5	12	10	15	20.9	Z11IL□□□□	I60 M2.5X6.5T	---	---	WT07IP		
	0016M11	▲	16	150	16	16	10.5	15	25.9		Z16IL□□□□	I60 M3.5X08TT	---	---	WT15IP	
	0016M16	▲	16	150	16	20	12	15	27	I60 M3.5X12TT		MT16-□□MN	SM4X8C			
	0020M16	▲	20	150	19	25	14	18	28.7							
	0020Q16	▲	20	180	19	25	14	18	34							
	0025M16	▲	25	150	24	32	17	23	28.8							
	0032R16	▲	32	200	31	40	22	30	30.9							
	0032S16	▲	32	250	31	40	22	30	30.9					Z22IL□□□□		I60 M5×13.2
	0040T16	▲	40	300	38.5	50	27	37	31.5							
	0050U16	▲	50	350	48.5	63	35	49	40.2							
	0020Q22	▲	20	180	19	25	15	18	35	I60 M4×15X	MT22-□□MN	SM5X8.5				
	0025R22	▲	25	200	24	32	19	23	39							
	0032S22	▲	32	250	31	40	22	30	36.4							
	0040T22	▲	40	300	38.5	50	27	37	37.2							
	0050U22	▲	50	350	48.5	63	35	47	42.6							

▲Stock available

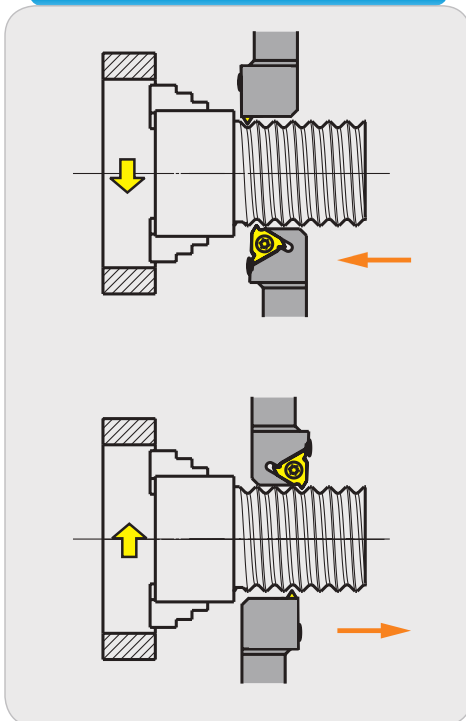
△Make-to-order

Please follow the following steps to get the best threading result:

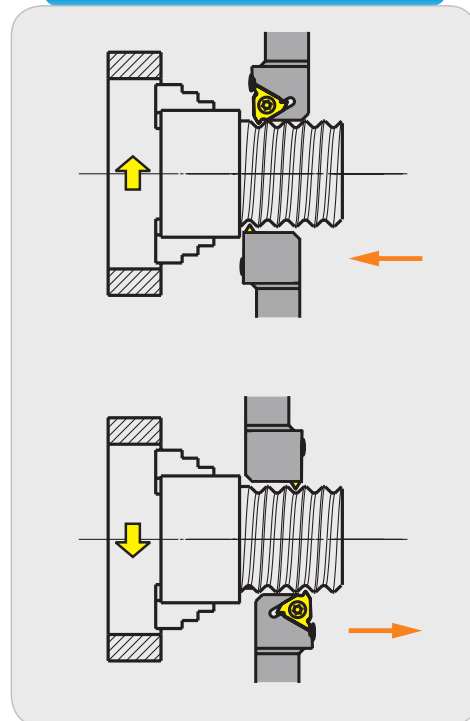
- 1 Select proper thread machining method.
- 2 Define helical angle and select shim.
- 3 Select proper insert and tool holder size.
- 4 By checking reference table of standard threading programs, select feasible cutting parameters.
- 5 Select feed way.

Machining method of threading tools

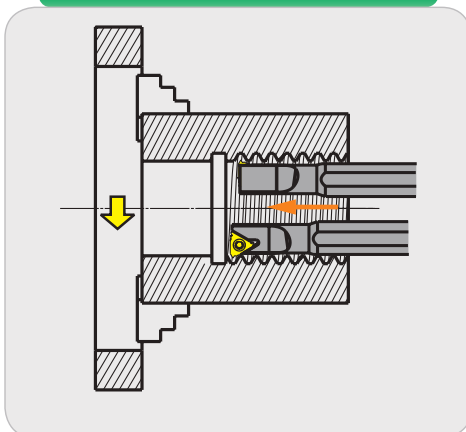
External threading machining (Right thread)



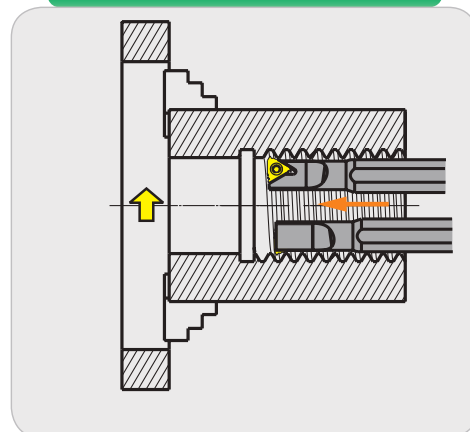
External threading machining (Left thread)



Internal threading machining (Right thread)



Internal threading machining (Left thread)





TURNING Threading Tools

Application information of threading

Decide helical angle and select shim

The clearance angle of threading inserts is actually along the edge (flank). This has significant effect on heat diffusion, spread of abrasion as well as tool life, security and pitch quality. The clearance angle of threading pitch on clearance face is determined by thread helical angle. These two angles are similar to each other to some extent. If inclined angle of insert is different from the helical angle, then the clearance angle won't be the same either.

The helical angle of pitch has to be the same with the inclined angle of insert to prevent over wearing on the clearance face which could affect tool life. the helical angle is calculated as below:

$$e = \arctan \frac{p}{d_2 \times \pi}$$

P= Pitch

d₂= pitch diameter

The most common inclined angle is 1°. MT standard shim and its inclined angle is also 1°.

Calculation of clearance angle:

Clearance angle is calculated as below:

$$\beta = \arctan (\tan \theta \times \tan \alpha)$$

2θ=Thread profile angle

α=The rake angle of external standard threading tools is 10°; the rake angle of internal standard threading tools is 15°.

The shim has to be changed when helical angle of thread is ≤ clearance angle of tool, which could cause intervene on insert flank.

Please change the shim to adjust the difference between helical angle of thread and inclined angle of shim to be within 2°~0°.

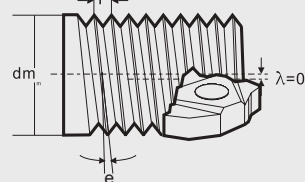
For example: when P=1.5, d₂=24mm, helical angle 1.14°-(2°~0°)=inclined angle (-0.86°~1.14°) it is feasible to use standard shim 1°.

Shim specification table is as follows:

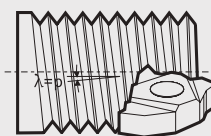
Screw pitch range	Insert dimensions	Inclined angle	Shim
0.5-3.0	16	0	MT16-00MN
		1	MT16-01MN
		2	MT16-02MN
		3	MT16-03MN
3.5-6.0	22	0	MT22-00MN
		1	MT22-01MN
		2	MT22-02MN
		3	MT22-03MN

Note: the standard angle of shim for our threading tools is 1°. ((MT16-01MN or MT22-01MN))

e = Helical angle



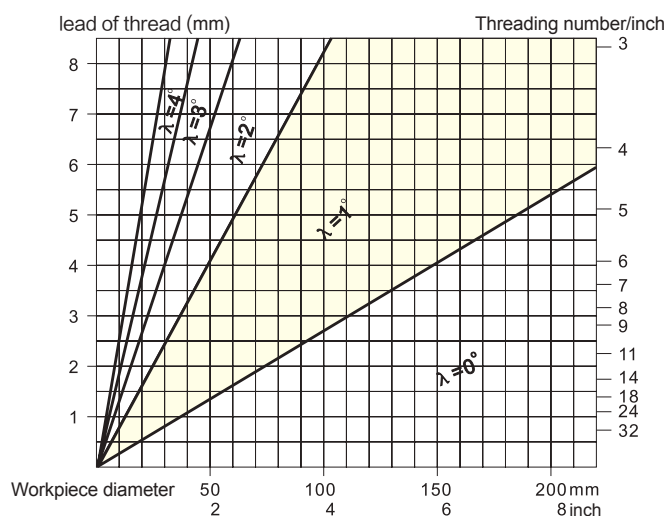
λ = Inclined angle



Please refer to the table below for actual value:

Thread profile angle 2θ	β	
	External thread	Internal thread
60°	5.8°	8.79°
55°	5.24°	7.94°
30°	2.7°	4.1°
29°	2.6°	3.96°

Select shim:





Select proper inserts and size of tool holder (Please refer to detailed table of threading tools and inserts)

Parameter table for threading program under different standards

Table of recommended in-feed for metric ISO external threading with wiper edge

Screw pitch	1.0	1.25	1.5	1.75	2.0	2.5	3.0	4.0	5.0
Total in-feed	0.72	0.86	1.02	1.17	1.33	1.63	1.94	2.58	3.21
Number of passes	5	6	7	8	9	11	13	15	17
Order to follow in threading operation	Value of radial in-feed (X) and flank in-feed (Z)								
	x/z	x/z	x/z	x/z	x/z	x/z	x/z	x/z	x/z
1	0.20/-	0.20/-	0.21/-	0.22/-	0.24/-	0.25/-	0.26/-	0.35/-	0.40/-
2	0.18/0.10	0.18/0.10	0.18/0.10	0.20/0.12	0.22/0.13	0.24/0.14	0.24/0.14	0.30/0.17	0.35/0.20
3	0.16/0.09	0.14/0.09	0.18/0.10	0.18/0.10	0.20/0.12	0.21/0.12	0.20/0.12	0.25/0.14	0.30/0.17
4	0.10/0.06	0.10/0.08	0.15/0.09	0.15/0.09	0.15/0.09	0.18/0.10	0.20/0.12	0.20/0.12	0.28/0.16
5	0.08/-	0.08/0.06	0.12/0.07	0.13/0.08	0.12/0.07	0.15/0.09	0.18/0.10	0.18/0.10	0.25/0.14
6			0.10/0.06	0.11/0.06	0.12/0.07	0.12/0.07	0.15/0.09	0.18/0.10	0.20/0.12
7			0.08/-	0.10/0.06	0.10/0.06	0.12/0.07	0.13/0.08	0.16/0.09	0.18/0.10
8				0.08/-	0.10/0.06	0.10/0.06	0.12/0.07	0.15/0.09	0.16/0.09
9					0.08/-	0.10/0.06	0.10/0.06	0.15/0.09	0.15/0.09
10						0.08/0.05	0.10/0.06	0.13/0.08	0.15/0.09
11						0.08/-	0.08/0.06	0.12/0.07	0.13/0.08
12							0.08/0.05	0.12/0.07	0.13/0.08
13								0.11/0.06	0.12/0.07
14								0.10/0.06	0.12/0.07
15								0.08/-	0.11/0.06
16									0.10/0.06
17									0.08/-

General
turningParting and
grooving

Threading

Application information of threading



TURNING Threading Tools

Application information of threading

Table of recommended in-feed for metric ISO internal threading with wiper edge

Screw pitch	1.00	1.25	1.5	1.75	2.0	2.5	3.0	4.0	5.0
Total in-feed	0.62	0.77	0.92	1.06	1.21	0.15	1.79	2.36	2.95
Number of passes	5	6	7	8	9	11	13	15	17
Order to follow in threading operation	Value of radial in-feed (X) and flank in-feed (Z)								
	x/z	x/z	x/z	x/z	x/z	x/z	x/z	x/z	x/z
1	0.18/-	0.20/-	0.22/-	0.23/-	0.24/-	0.25/-	0.26/-	0.30/-	0.32/-
2	0.14/0.08	0.15/0.09	0.16/0.09	0.16/0.09	0.18/0.10	0.20/0.12	0.20/0.12	0.25/0.14	0.28/0.16
3	0.12/0.07	0.12/0.07	0.14/0.08	0.14/0.08	0.15/0.09	0.15/0.09	0.20/0.12	0.22/0.13	0.25/0.14
4	0.10/0.06	0.12/0.07	0.12/0.07	0.13/0.08	0.14/0.08	0.15/0.09	0.18/0.10	0.20/0.12	0.22/0.13
5	0.08/-	0.10/0.06	0.11/0.06	0.12/0.07	0.12/0.07	0.13/0.08	0.15/0.09	0.18/0.10	0.21/0.12
6			0.09/0.05	0.10/0.06	0.11/0.06	0.12/0.07	0.12/0.07	0.15/0.09	0.20/0.12
7			0.08/-	0.10/0.06	0.10/0.06	0.12/0.07	0.12/0.07	0.15/0.09	0.18/0.10
8				0.08/-	0.09/0.05	0.10/0.06	0.10/0.06	0.15/0.09	0.18/0.10
9					0.08/-	0.10/0.06	0.10/0.06	0.12/0.07	0.15/0.09
10						0.09/0.05	0.10/0.06	0.12/0.07	0.15/0.09
11						0.08/-	0.10/0.06	0.12/0.07	0.15/0.09
12							0.08/0.05	0.11/0.06	0.15/0.09
13								0.11/0.06	0.12/0.07
14								0.10/0.06	0.11/0.06
15								0.08/-	0.10/0.06
16									0.10/0.06
17									0.08/-

General turning

Parting and grooving

Threading

Application information of threading



Table of recommended in-feed for American unified standard external threading with wiper edge

Screw pitch	24	20	18	16	14	12	11	10	9	8	7	6	5
Total in-feed	0.649	0.779	0.866	0.974	1.113	1.299	1.416	1.558	1.731	1.948	2.226	2.597	3.116
Number of passes	5	6	6	7	9	9	10	11	12	13	14	15	16
Order to follow in threading operation	Value of radial in-feed (X) and flank in-feed (Z)												
	x/z	x/z	x/z	x/z	x/z	x/z	x/z	x/z	x/z	x/z	x/z	x/z	x/z
1	0.206 / 0.086	0.210 / 0.094	0.233 / 0.104	0.226 / 0.109	0.196 / 0.110	0.229 / 0.128	0.220 / 0.132	0.214 / 0.139	0.210 / 0.148	0.211 / 0.160	0.213 / 0.176	0.218 / 0.198	0.229 / 0.230
2	0.148 / 0.086	0.163 / 0.094	0.181 / 0.104	0.188 / 0.109	0.189 / 0.110	0.222 / 0.128	0.228 / 0.132	0.240 / 0.139	0.256 / 0.148	0.276 / 0.160	0.304 / 0.176	0.343 / 0.198	0.399 / 0.230
3	0.114 / 0.066	0.125 / 0.072	0.139 / 0.080	0.145 / 0.083	0.146 / 0.084	0.170 / 0.098	0.176 / 0.102	0.184 / 0.106	0.196 / 0.113	0.212 / 0.122	0.234 / 0.135	0.263 / 0.152	0.306 / 0.177
4	0.096 / 0.055	0.105 / 0.061	0.117 / 0.068	0.122 / 0.070	0.123 / 0.071	0.143 / 0.083	0.148 / 0.086	0.155 / 0.090	0.165 / 0.095	0.179 / 0.103	0.197 / 0.114	0.222 / 0.128	0.258 / 0.149
5	0.085 / 0.049	0.093 / 0.054	0.103 / 0.059	0.107 / 0.062	0.108 / 0.062	0.126 / 0.073	0.131 / 0.075	0.137 / 0.079	0.146 / 0.084	0.158 / 0.091	0.173 / 0.100	0.195 / 0.113	0.227 / 0.131
6		0.084 / 0.048	0.093 / 0.054	0.097 / 0.056	0.098 / 0.056	0.114 / 0.066	0.118 / 0.068	0.124 / 0.072	0.132 / 0.076	0.142 / 0.082	0.157 / 0.091	0.177 / 0.102	0.205 / 0.119
7				0.089 / 0.052	0.090 / 0.052	0.105 / 0.061	0.109 / 0.063	0.114 / 0.066	0.121 / 0.070	0.131 / 0.076	0.144 / 0.083	0.163 / 0.094	0.189 / 0.109
8					0.084 / 0.048	0.098 / 0.056	0.101 / 0.058	0.106 / 0.061	0.113 / 0.065	0.122 / 0.070	0.134 / 0.078	0.151 / 0.087	0.176 / 0.101
9					0.079 / 0.045	0.092 / 0.053	0.095 / 0.055	0.100 / 0.057	0.106 / 0.061	0.114 / 0.066	0.126 / 0.073	0.142 / 0.082	0.165 / 0.095
10							0.090 / 0.052	0.094 / 0.054	0.100 / 0.058	0.108 / 0.063	0.119 / 0.069	0.134 / 0.078	0.156 / 0.090
11								0.090 / 0.052	0.095 / 0.055	0.103 / 0.059	0.113 / 0.065	0.128 / 0.074	0.149 / 0.086
12									0.091 / 0.053	0.098 / 0.057	0.108 / 0.063	0.122 / 0.071	0.142 / 0.082
13										0.094 / 0.054	0.104 / 0.060	0.117 / 0.068	0.136 / 0.079
14											0.100 / 0.058	0.113 / 0.065	0.131 / 0.076
15												0.109 / 0.063	0.126 / 0.073
16													0.122 / 0.071

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Table of recommended in-feed for American unified standard internal threading with wiper edge

Screw pitch	24	20	18	16	14	12	11	10	9	8	7	6	5
Total in-feed	0.573	0.687	0.764	0.860	0.982	1.146	1.250	1.375	1.528	1.719	1.964	2.291	2.750
Number of passes	5	6	6	7	8	9	9	10	11	12	13	14	15
Order to follow in threading operation	Value of radial in-feed (X) and flank in-feed (Z)												
	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z
1	0.193 / —	0.200 / —	0.222 / —	0.219 / —	0.220 / —	0.228 / —	0.250 / —	0.247 / —	0.246 / —	0.252 / —	0.262 / —	0.278 / —	0.302 / —
2	0.127 / 0.073	0.239 / 0.081	0.155 / 0.089	0.161 / 0.093	0.173 / 0.100	0.190 / 0.110	0.207 / 0.120	0.216 / 0.125	0.229 / 0.132	0.247 / 0.142	0.271 / 0.156	0.304 / 0.176	0.353 / 0.204
3	0.098 / 0.056	0.107 / 0.062	0.119 / 0.069	0.124 / 0.072	0.132 / 0.076	0.146 / 0.084	0.159 / 0.092	0.166 / 0.096	0.176 / 0.101	0.189 / 0.109	0.208 / 0.120	0.234 / 0.135	0.271 / 0.156
4	0.082 / 0.048	0.090 / 0.052	0.100 / 0.058	0.104 / 0.060	0.112 / 0.064	0.123 / 0.071	0.134 / 0.077	0.140 / 0.081	0.148 / 0.086	0.160 / 0.092	0.175 / 0.101	0.197 / 0.114	0.228 / 0.132
5	0.073 / 0.042	0.079 / 0.046	0.088 / 0.051	0.092 / 0.053	0.098 / 0.057	0.108 / 0.062	0.118 / 0.068	0.123 / 0.071	0.130 / 0.075	0.141 / 0.081	0.1543 / 0.089	0.173 / 0.100	0.201 / 0.116
6		0.072 / 0.041	0.080 / 0.046	0.083 / 0.048	0.089 / 0.051	0.098 / 0.056	0.107 / 0.062	0.111 / 0.064	0.118 / 0.068	0.127 / 0.073	0.140 / 0.081	0.157 / 0.091	0.182 / 0.105
7				0.077 / 0.044	0.082 / 0.047	0.090 / 0.052	0.098 / 0.057	0.102 / 0.059	0.108 / 0.063	0.117 / 0.067	0.128 / 0.074	0.144 / 0.083	0.167 / 0.097
8					0.076 / 0.044	0.084 / 0.048	0.091 / 0.053	0.095 / 0.055	0.101 / 0.058	0.109 / 0.063	0.119 / 0.069	0.134 / 0.078	0.156 / 0.090
9						0.079 / 0.045	0.086 / 0.050	0.090 / 0.052	0.095 / 0.055	0.102 / 0.059	0.112 / 0.065	0.126 / 0.073	0.146 / 0.084
10								0.085 / 0.049	0.090 / 0.052	0.097 / 0.056	0.106 / 0.061	0.119 / 0.069	0.138 / 0.080
11									0.085 / 0.049	0.092 / 0.053	0.101 / 0.058	0.113 / 0.065	0.131 / 0.076
12										0.088 / 0.051	0.096 / 0.056	0.108 / 0.063	0.126 / 0.073
13											0.092 / 0.053	0.101 / 0.060	0.121 / 0.070
14												0.100 / 0.058	0.116 / 0.067
15													0.112 / 0.065

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Table of recommended in-feed for British standard internal and external threading with wiper edge

Screw pitch	28	20	19	16	14	12	11	10	9	8	7	6	5
Total in-feed	0.581	0.813	0.856	1.017	1.162	1.355	1.479	1.626	1.807	2.033	2.324	2.711	3.253
Number of passes	5	6	6	8	8	9	9	10	11	12	14	15	16
Order to follow in threading operation	Value of radial in-feed (X) and flank in-feed (Z)												
	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z
1	0.179 / 0.070	0.211 / 0.089	0.223 / 0.094	0.196 / 0.097	0.223 / 0.111	0.226 / 0.122	0.246 / 0.133	0.236 / 0.139	0.230 / 0.147	0.255 / 0.158	0.195 / 0.167	0.197 / 0.189	0.204 / 0.219
2	0.134 / 0.054	0.172 / 0.069	0.181 / 0.072	0.186 / 0.074	0.213 / 0.085	0.234 / 0.093	0.255 / 0.102	0.226 / 0.106	0.282 / 0.113	0.304 / 0.121	0.322 / 0.128	0.361 / 0.145	0.421 / 0.168
3	0.104 / 0.045	0.132 / 0.058	0.139 / 0.061	0.143 / 0.063	0.163 / 0.072	0.180 / 0.079	0.197 / 0.086	0.206 / 0.090	0.216 / 0.095	0.233 / 0.102	0.247 / 0.108	0.278 / 0.122	0.323 / 0.142
4	0.087 / 0.040	0.111 / 0.051	0.117 / 0.054	0.120 / 0.055	0.138 / 0.063	0.151 / 0.069	0.165 / 0.076	0.172 / 0.079	0.182 / 0.084	0.197 / 0.090	0.208 / 0.095	0.234 / 0.108	0.272 / 0.125
5		0.089 / 0.046	0.093 / 0.049	0.096 / 0.050	0.110 / 0.057	0.121 / 0.063	0.131 / 0.068	0.137 / 0.071	0.145 / 0.076	0.157 / 0.082	0.166 / 0.086	0.187 / 0.097	0.217 / 0.113
6				0.088 / 0.046	0.101 / 0.052	0.111 / 0.058	0.121 / 0.063	0.126 / 0.066	0.134 / 0.070	0.144 / 0.075	0.152 / 0.079	0.172 / 0.089	0.200 / 0.104
7				0.082 / 0.043	0.093 / 0.049	0.103 / 0.054	0.113 / 0.059	0.117 / 0.061	0.124 / 0.065	0.134 / 0.070	0.142 / 0.074	0.160 / 0.083	0.186 / 0.097
8						0.097 / 0.050	0.106 / 0.055	0.110 / 0.057	0.117 / 0.061	0.126 / 0.066	0.133 / 0.069	0.150 / 0.078	0.174 / 0.091
9								0.104 / 0.054	0.111 / 0.058	0.119 / 0.062	0.126 / 0.066	0.142 / 0.074	0.165 / 0.086
10									0.105 / 0.055	0.113 / 0.059	0.120 / 0.062	0.135 / 0.070	0.157 / 0.082
11										0.108 / 0.056	0.114 / 0.060	0.129 / 0.067	0.150 / 0.078
12											0.110 / 0.055	0.124 / 0.064	0.144 / 0.075
13												0.119 / 0.062	0.138 / 0.072
14												0.115 / 0.060	0.133 / 0.069
15													0.129 / 0.067
16													

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■ Table of recommended in-feed for NPT internal and external threading with wiper edge

Screw pitch	27	18	14	11.5	8
Total in-feed	0.75	1.129	1.451	1.767	2.54
Number of passes	6	8	10	12	14
Order to follow in threading operation	Value of radial in-feed (X) and flank in-feed (Z)				
	X/Z	X/Z	X/Z	X/Z	X/Z
1	0.19/-	0.22/-	0.240/-	0.24/-	0.255/-
2	0.15/0.087	0.181/0.104	0.200/0.115	0.208/0.120	0.250/0.144
3	0.13/0.075	0.152/0.088	0.170/0.098	0.182/0.105	0.245/0.141
4	0.11/0.063	0.141/0.081	0.150/0.086	0.168/0.097	0.230/0.133
5	0.09/0.052	0.131/0.075	0.140/0.081	0.155/0.089	0.210/0.121
6	0.08/0.46	0.121/0.070	0.130/0.075	0.145/0.084	0.195/0.112
7		0.101/0.058	0.120/0.069	0.138/0.079	0.180/0.104
8		0.082/0.047	0.110/0.063	0.124/0.072	0.175/0.101
9			0.100/0.058	0.117/0.067	0.170/0.098
10			0.091/0.052	0.105/0.060	0.155/0.089
11				0.095/0.055	0.140/0.080
12				0.090/0.052	0.125/0.072
13					0.110/0.063
14					0.100/0.058

■ Table of recommended in-feed for BSPT internal and external threading with wiper edge

Screw pitch	28	19	14	11
Total in-feed	0.581	0.856	1.162	1.479
Number of passes	5	6	8	10
Order to follow in threading operation	Value of radial in-feed (X) and flank in-feed (Z)			
	X/Z	X/Z	X/Z	X/Z
1	0.179/-	0.223/-	0.222/-	0.214/-
2	0.134/0.070	0.181/0.094	0.213/0.111	0.242/0.126
3	0.103/0.054	0.139/0.072	0.163/0.085	0.186/0.097
4	0.087/0.045	0.117/0.061	0.138/0.072	0.157/0.082
5	0.078/0.040	0.103/0.054	0.121/0.063	0.138/0.072
6		0.093/0.049	0.110/0.057	0.125//0.065
7			0.101/0.052	0.115/0.060
8			0.094/0.049	0.107/0.056
9				0.100/0.052
10				0.095//0.049

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Table of recommended cutting parameters

ISO	Material		Unit cutting force Kc0.4 N/mm ²	Hardness HB	Grade	
					YBG202 YBG203 YBG205	
					Cutting speed(m/min)	
P	Carbon steel	C=0.15%	1900	125	150-175	
		C=0.35%	2100	150	140-155	
		C=0.60%	2250	200	130-145	
	Alloy steel	Anneal	2100	180	110-130	
		Hardened	2600	275	80-100	
		Hardened	2700	300	70-90	
		Hardened	2850	350	60-80	
	High alloy steel	Anneal	2600	200	90-115	
		Hardened	3900	325	70-90	
	Cast steel	Non-alloy	2000	180	180-210	
		low alloy	2500	200	90-115	
		High alloy	2700	225	90-115	
Martensite steel 12%Mn		3600	250	40-50		
M	Stainless steel	Austenite	2450	180	110-130	
		Martensite/Ferrite	2300	200	130-170	
K	Malleable cast iron	Ferrite	1100	130	110-140	
		Pearlite	1100	230	85-105	
	Gray cast iron	Low tensile-strength	1100	180	110-140	
		High tensile-strength	1500	260	90-115	
	Nodular cast iron	Ferrite	1100	160	110-130	
		Pearlite	1800	250	80-100	
N	Al alloy	Non-aging treatment Aging treatment		500 800	60 100	1300-1450 450-500
	Cast aluminum alloy	Non-aging treatment Aging treatment		750 900	75 90	430-470 250-290
S	Heat resistant alloy	Iron base	Anneal	3000	200	35-50
			Aging	3050	280	25-35
		Ni- or Co- base	Anneal	3500	250	15-25
			Aging Casting	4150 4150	350 320	10-20 10-15
H	Hardened steel	Hardened steel		4500	HRC55	40-50

Note: •The values in the above table are range values. High values in the range could be considered in actual cutting. When trying new cutting speed, please check the cutting edge condition before operation.
 •In stainless steel threading, high cutting speed should be used to prevent built-up edge.
 •The cutting parameters should be reduced when cutting small pitch thread and when using tools with small nose radius.
 •When cutting thread by tools with small nose radius, such as NPT standard thread, it is advisable to use tools with big nose radius first to rough, so as to improve the life of tools with small nose radius.

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In-feed way of threading tools

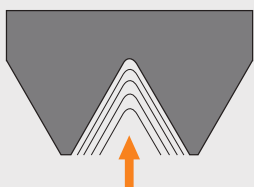
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Radial in-feed



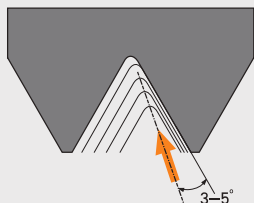
- Easy operating, high general.
- V-shape chip caused by long chip steel workpiece will produce big bend stress on cutting edge.
- It requires low cutting depth, sharp cutting edge and good tough material.
- Big quantity of heat when cutting ,V-shape chip is hard to control.
- Because the interface of cutting chips on the right and left side is long, so it is easy to cause vibration and make the cutting edge suffer more overloading.

Flank in-feed



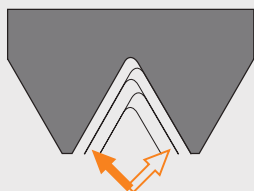
- Cutting edge suffer small bend stress, stable estate, it is easy for chips formation in deep cutting depth.
- There are enough space to leave chips flow when flank in-feed.
- Big abrasion on right flank.

Modified flank in-feed



- Right Cutting Edge also engage on cutting depth to a certain extent, it can reduce the abrasion on right side of clearance face.
- Cutting edge suffer small bend stress, stable estate, it is easy for chips formation in deep cutting depth.
- Good Cutting Performance.

Alternate flank in-feed



- Cutting edge trade off when machining, equality abrasion on left and right side of clearance face on cutting edge, it can improve the life of tools.
- Chips are flowing from both of right and left side, good chips flowing.
- Recommend using in big screw-pitch thread cutting.



Recommend adopting flank in-feed or alternate flank in-feed under allowable range of machining equipment or programmer, it can eliminate the machining vibration effectively, and it has enough space discharge the chips between pitch. Cutting edge suffer a small stress, machining stable, it likes the general turning process when machining thread, good chip control without extra chips.



Common problems in threading and solutions

Problem	Cause	Solutions
Wear on clearance face	Cutting speed too high.	Reduce cutting speed.
	Low cutting depth, abrasion.	Reduce frequency of feed and friction of cutting edge.
	Inserts are over the center line.	Adopt correct center height.
Asymmetric wear on right and left cutting edge	The inclined angle of insert is different from the helical angle of thread.	Change to proper shim to get correct inclined angle.
	Flank in-feed is not correct.	Change the way of flank in-feed.
Breakage	Cutting speed too low.	Increase cutting speed.
	Cutting force too high.	Increase frequency of feed and reduce Max in-feed.
	Unstable clamping.	Check if workpiece vibrates. Reduce overhang of tool. Verify clamping of workpiece and tool.
	Chip twisting.	Increase the pressure of cooling liquid to blow away chips.
Plastic deformation	High cutting speed, high temperature on cutting area.	Reduce cutting speed. Increase feed frequency and reduce Max cutting depth.
	Insufficient cooling fluid.	Increase cooling fluid supply.
Low thread surface quality	Cutting speed too low. The insert is over the center line. Chips are not under control.	Increase cutting speed. Adjust centre height. Change the operation way of tools to well control chips.
Incorrect profile	Incorrect center height.	Adjust centre height.
	Pitch on machine is not correct.	Adjust machine.
Shallow profile	Cutting speed set wrong.	Adjust cutting depth.
Surface damage	Chips involved or contacted.	Change to flank in-feed to control chip flow direction.
Built-up edge	Temperature of cutting edge is too low. Usually occur when machining stainless steel and low carbon steel.	Increase cutting speed as well as pressure and concentration of cooling fluid. Choose inserts with good toughness.
Crack on surface	Cutting force too high	Reduce the cutting depth of each feed.
Vibration	Incorrect clamping of workpiece or tool	Verify clamping of workpiece and tool. Minimize overhang of tool.
	Incorrect cutting parameters	Increase cutting speed or reduce it substantially.
	Incorrect tool clamping	Adjust center height.

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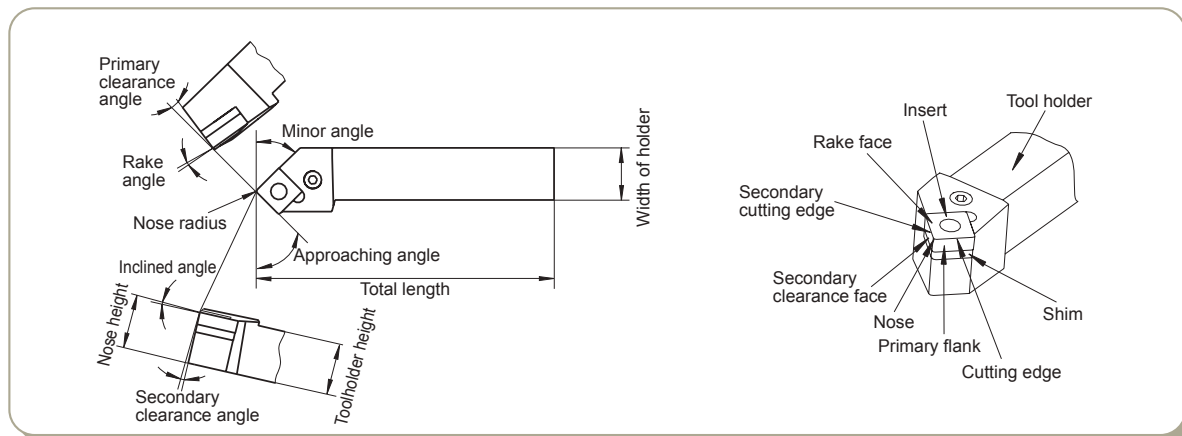
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The functions of each part of turning tools

1 The names of each part of turning tools



2 Effects of rake angle

Larger rake angle makes cutting edge sharper, reduces resistant forces of chip flow, diminishes friction and prevent deformation, leading to smaller cutting forces and cutting power, lower cutting temperature, less abrasion and higher surface quality. However, too large rake angle would reduce the rigidity and strength of tool. Heat can't be diffused easily. Serious breakage and abrasion on tool would occur, reducing tool life. Please choose rake angle according to machining conditions.

Value selection	Situations
Small rake angle	● When machining brittle and hard materials ● When roughing and intermittent cutting
Big rake angle	● When machining plastic or soft materials ● When finishing

3 Effects of clearance angle

The main function of clearance angle is to reduce the friction between the clearance face of tool and the surface of workpiece. When the rake angle is fixed, larger clearance angle can increase the sharpness of cutting edge, reduce cutting forces and friction, and then achieve higher surface quality. However, if clearance angle is too large, the strength of cutting edge would decrease. Also, heat can't be diffused easily and serious abrasion would occur, reducing tool life.

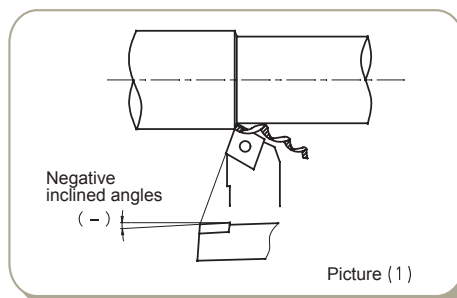
The principle of choosing clearance angle: Choose small clearance angle if friction is not serious.

Value Selection	Situations
Small clearance angle	● In order to increase nose strength when roughing ● When machining brittle and hard materials
Large clearance angle	● In order to reduce friction when finishing ● When machining materials easy to be hardened

4 Effects of inclined angle

Positive or negative inclined angle determines the direction of chip flow, and also affects the strength and impact resistance of insert nose.

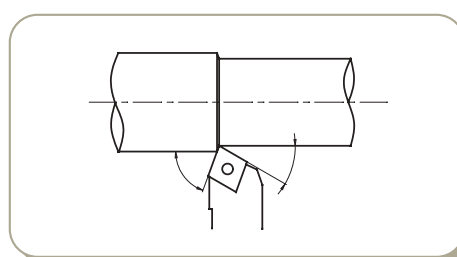
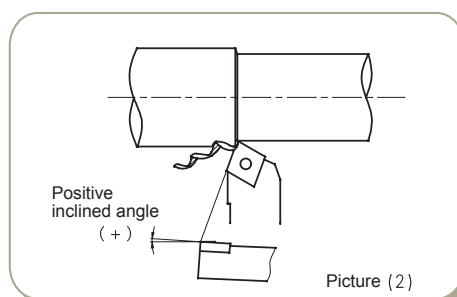
◆As diagram (1) shows, when the inclined angle is negative, namely nose is in the lowest point as apposed to the bottom of tool, chips flow to the machined surface of workpiece.





◆ As diagram (2) shows, when inclined angle is positive, namely the nose is in the highest point as apposed to the bottom of the tool, chips flow to the areas of workpiece surface that haven't been machined.

◆ The change of inclined angle also affects insert nose strength and impact resistance. When the inclined angle is negative, the nose is in the lowest point of cutting edge. When the cutting edge enters the workpiece, the contacting point is on the cutting edge or rake face, protecting the nose from impact and increase the strength of the nose. Normally, negative inclined angle should be chosen for tools with big rake angle. This can not only increase nose strength, but also prevent the impact of entry.



5 Effects of approach angle

Reduced approaching angle increases the strength of tools and enable heat to diffuse easily, improving surface quality. This is because when the approach angle is small, cutting edge width is large, and then the unit width of cutting edge bears less cutting force. Meanwhile, tool life can be improved.

Normally, select 90° approach angle for turning of slender and step shaft; select 45° approach angle for external turning, end surface machining and chamfering. When approach angle is larger, radial force is reduced, cutting is stable, cutting thickness is increased, and chip breaking is excellent.

Value selection	Situations
Small approach angle	For those materials with high intensity, high hardness and hardened layer on the surface
Big approach angle	When rigidity of the machine is not enough

6 Effects of minor angle

Minor angle is the main angle that can affect surface quality, and it can also affect tool strength. If the approach angle is too small, the friction between the secondary flank and machined surface of workpiece will increase, causing vibration.

The principle of selecting minor angle: Select small minor angle when roughing or when the friction is unaffected and there is no vibration. Select large minor angle when finishing.

7 Nose radius

Nose radius significantly affects nose strength and surface quality.

Large nose radius means higher cutting edge strength, and the abrasion on the rake face and clearance face can be reduced to some extent. However, if the nose radius is too large, radial force will increase, and vibration is easy to occur, affecting machining precision and surface quality.

Value selection	Situations
Small nose radius	● Finishing at small cutting depth ● Machining parts such as slender shaft ● When the rigidity of the machine is not enough
Large nose radius	● When roughing ● When machining hard materials (intermittent cutting) ● When the rigidity of the machine is not enough



Calculation method of turning parameters

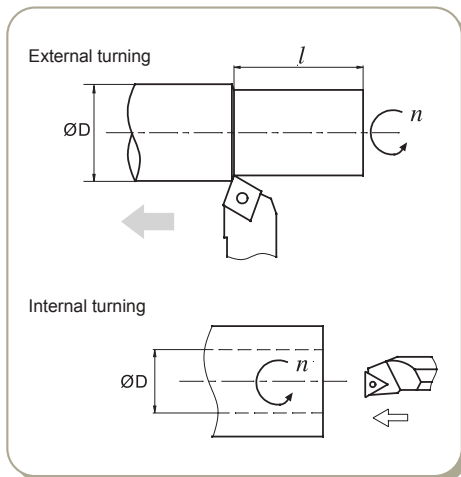
General
turning

Parting
and
grooving

Threading

General technical information for turning

1 Calculation of cutting speed



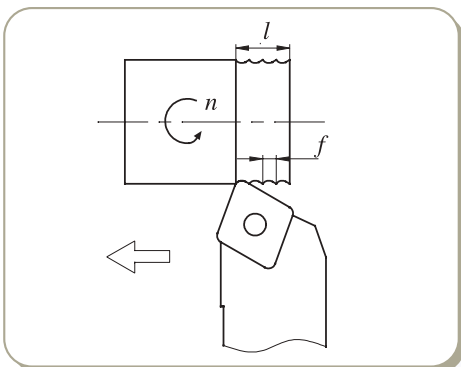
$$V_c = \frac{\pi \times D \times n}{1000} \text{ (m/min)}$$

In the formula: V_c : Cutting speed (m/min)
 n : Rotating speed of main axle (rev/min)
 D : Diameter of workpiece (mm)

For example: When the rotating speed is 280rev/min and the diameter of workpiece is 150mm, the cutting speed should be:

$$V_c = \frac{\pi \times D \times n}{1000} \text{ (m/min)} = 132 \text{ (m/min)}$$

2 Calculation of feed rate



$$f = \frac{l}{n} \text{ (mm/rev)}$$

In the formula: f : Feed rate per rotation (mm/rev)
 l : Cutting length per minute (mm/min)
 n : Rotating speed of main axle (rev/min)

For example: When the rotating speed of main axle is 500rev/min, and the cutting length per minute is 100mm/min, the feed rate per rotation should be:

$$f = \frac{l}{n} = \frac{100}{500} = 0.2 \text{ (mm/rev)}$$





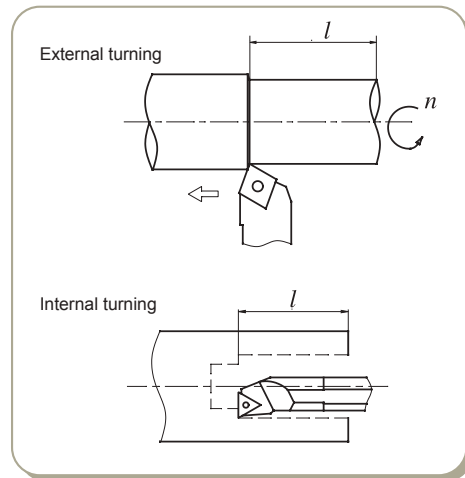
3 Cutting time calculation of external and internal turning

$$T = \frac{l}{f \times n} \text{ (min)}$$

In the formula: T: Cutting time (min)
 l: Length of machined areas (mm)
 f: Feed rate (mm/rev)
 n: Rotating speed of main axle (rev/min)

For example: When the rotating speed of main axle is 250rev/min, and the feed rate is 0.2mm/rev, the time needed for a cutting length of 150mm should be:

$$T = \frac{l}{f \times n} = \frac{150}{0.2 \times 250} = 3 \text{ (min)}$$



General turning

Parting and grooving

Threading

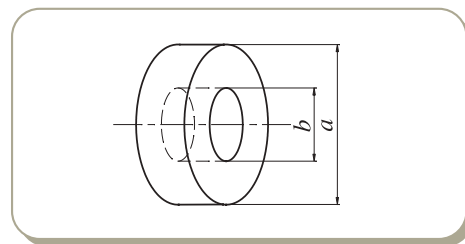
General technical information for turning

4 Time calculation for end surface turning (constant linear speed)

$$T = \frac{\pi \times (a^2 - b^2)}{4000 \times V_c \times f} \text{ (min)}$$

In the formula: T: Cutting time (min)
 V_c: Cutting speed (m/min)
 f: Feed rate (mm/rev)

For end surface without hole, b=0, the formula is still valid.



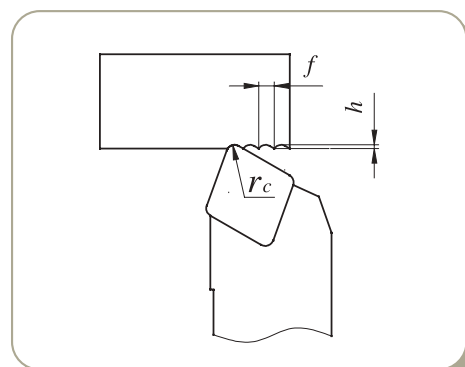
5 Theoretical value calculation of machined surface roughness

$$R = \frac{f^2}{8r_c} \times 1000 \text{ (}\mu\text{m)}$$

In the formula: R: Theoretical roughness value of machined surface
 f: Feed rate (mm/rev)
 r_c: Nose radius (mm)

For example: When the feed rate is 0.2mm/rev, and the nose radius is 0.4mm, the theoretical roughness value of machined surface should be:

$$R = \frac{f^2}{8r_c} \times 1000 = \frac{0.2^2}{8 \times 0.4} \times 1000 = 12.5 \text{ (}\mu\text{m)}$$





Effect of three main turning parameters on machining

General
turning

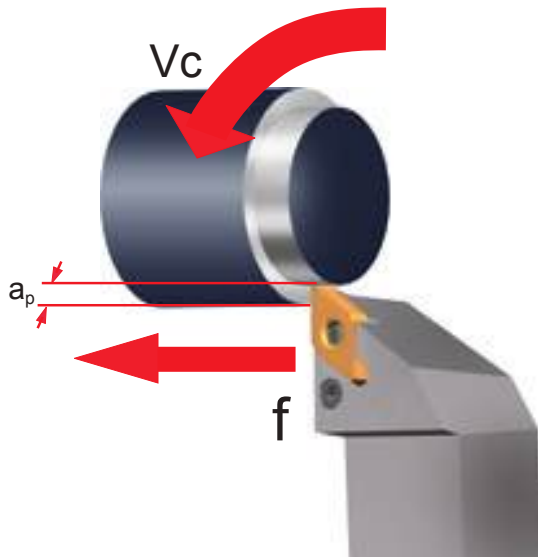
Parting and
grooving

Threading

General technical information for turning

Effects of three main parameters

Normally, short machining time, long tool life and high machining precision are expected in machining, so the material quality, hardness, and shape of the workpiece, and properties of machine should be fully considered, and then we can select suitable tools and adopt high-efficiency cutting parameters, namely three parameters.



Cutting speed (V_c)

When the workpiece is rotating on the machine, the number of its rotation per minute is defined as Rotating speed of main axle (n). Because of its rotation, the cutting speed measured on the contacting point of diameter is defined as linear speed, m/min. Normally, linear speed is considered to measure the effect of cutting speed on machining.

Effect of cutting speed

Cutting speed has significant effect on tool life. When the cutting speed is increased, cutting temperature will increase and tool life will be shortened. Cutting speed varies according to the different types and hardness of workpiece. The below conclusions are reached after many cutting experiments:

(1) Normally tool life would be reduced to half when the cutting speed is increased by 20%. Tool life would be 20% of the original life if the cutting speed is raised by 50%.

(2) Low speed (20-40m/min) cutting could easily cause vibration and shorten tool life.

Feed rate (f_n)

Feed rate is defined as the moving distance of tool after workpiece rotates for one circle, measured by mm/rotation.

Effect of feed rate

Feed rate is a key factor that determines surface quality. Meanwhile it also affect the range of chip forming and the thickness of chips during machining.

In term of the effect on tool life, small feed rate leads to serious abrasion on clearance face, greatly reducing tool life.

Cutting depth (a_p)

Cutting depth is defined as the difference between machined surface and unmachined surface, measured by mm. It is half the difference value between the original diameter and machined diameter.

Effect of cutting depth

Cutting depth should be determined by the machining allowance and shape of workpiece, power and rigidity of machine, and tool rigidity.

The change of cutting depth has little effect on tool life. If the cutting depth is too low, the cutting nose only scrapes the hardened layer on the workpiece surface, reducing tool life. When there is hardened oxide layer on workpiece surface, higher cutting depth should be adopted within the possible range of machine's power to avoid cutting nose just cutting the hardened layer of workpiece.



Comparison table for turning inserts chipbreaker

Comparison table for turning insert chipbreaker

Negative inserts

ISO	Machining range	ZCCCT	SANDVIK	KORLOY	TaeguTec	WALTER	SECO	MITSUBISHI	SUMITOMO	KENAMETAL	DIJET	HITACHI	TUNGALOY	KYOCERA	VALANTTE
P	For extra finishing		QF LC	HU	FA FX	FP5	FF1 FF2	PK※ FH, FY FP, FS	FB FA, FL	FF		FE	01※, TF, ZF 11	DP※, GP, PP, VF, XP XP-T, XF	F1
	For finishing	DF	PF XF	HF	FG FM	MP3, FV5 NF3, NF4	MF2	LP, C SA, SH	FE, SU, LU, SX, SE	LF, FN	PF, UR UA, UT	BE, CE B, BH	NS, 27 TSF, AS, TQ	HQ, CQ PQ	F2(2B), F5(5C)
	For finishing (Soft steel)	SF		HF	FC			SY					17	XQ, XS	
	For finishing (Wiper)	WGF	WL WF	HW	WS	NF	W-MF2	SW	LUW SEW	FW			AFW, ASW FW, SW	WF WP, WQ	
	For semi-finishing	DM PM	PM QM XM	HA HC HM	PC FT MT SM MP	MF3 MV5	MF3 M5	MP MA MH	GU UG UX GE	P MN	PG UB	CT AB AY AE AH	NM, ZM TM, DM 37, AM 33, 38	PG, C-J, GS, PS HS, PT	F3, F4(8A), M2(2C), M3 M4, M5(5B), M6, M7, 55, M8
M	For semi-finishing (Wiper)	WGM	WMX WM		WT	NM	W-M6 W-M3 W-MF5	MW	GUW	MW RW				WE	
	For light roughing	LR(Single-side) DR(Double-side)	PR, HM XMR		RT	NM6, RP5 NM9, RP7	MR7 MR6	RP GH	MU, MX ME, UZ	RN RP	UD, GG	Y, RE	TH	RH, GT	
	For heavy roughing	HDR HPR	QR PR HR MR	HR HH	RX, HD HY, HT RT, RH HZ, EH	NR6 NRF NRR	R5, R56 R4, R6 R7, PR9 R57, RR6 R8	HM, HL HZ, HX HV, HR	MP, HG HP, HU HW, HF	MR, RM RH	UC	TE, UE HX, HE H	TU, TRS TUS	PX	R3, R4, R6(9A) R7(9B), R9(9C)

※ Periphery grinding type

Comparison table for turning inserts chipbreaker

Threading

Parting and grooving

General turning



Comparison table for turning inserts chipbreaker

General
turningParting and
grooving

Threading

Comparison table for turning
inserts chipbreaker

Comparison table for turning insert chipbreaker

Negative inserts

ISO	Machining range	ZCCCT	SANDVIK	KORLOY	TaeguTec	WALTER	SECO	MITSUBISHI	SUMITOMO	KENNAMETAL	DIJET	HITACHI	TUNGALOY	KYOCERA	VALANTTE
M	For finishing	EF	MF	HA	SF	NF4, FM5	MF1	SH, LM	SU, EF	FP, LF※		MP, AB BH	SS	MQ GU	F1, F2(2B), F5(5C)
	For semi-finishing	EM	MM, QM XM, K	HS	ML, EM MM, VF	MM5 RM5 NM4	MF4	MS, ES GM, MM MA	EX, EG UP, GU HM	MP	SF, SG SZ	DE PV SE AH	SF, SA, SM, S	MS, MU SU, HU, ST, TK	F3, F4(8A), M2(2C), M3 M4, M5(5B), M6, M7, 55, M8
	For roughing	ER	MR	GS, HM	MT	NR4 NR5	M5, MR7 RR6	GH, HZ RM, HL	EM, MU MP	UP RP		AE	TH, SH		R3, R4, R6(9A) R7(9B), R9(9C)
K	For finishing	PM	KF			MK5	MF2, M3 MF5, M4	VA AH		FN		VA, AH	CF	KQ	F2(2B)
	For Semi-Finishing	PM	KM	Through chip-breaker, HM	MC	RK5 NM5	M5	V AE	UZ, GZ UX	RP, UN	PG	V, AE	CM	KG, C	M5(5B), M6, M8
	For roughing	Without chip-breaker	KR KRR	GR, HR GH	KT	RK7		RE			GG	RE		KH, GC	R3, R4, R7(9B)
S	For finishing	NF/NGF	SF SGF※		EA	NF4, NFT MS3	MF5, MF1 MF4	FJ※, LS MJ, MJ※	EF, SU※	FS, LF※ MS			HRF	MQ	F5(5C), M2(2C)
	For semi-finishing	NM	NGP※, SM			NMT, NMS	M1	MS	EG, EX SU※, UP	NGP※ UP, P		VI	HRM, SA HMM	SQ, MS MU, TK	M4, M5(5B), M7, 55
	For roughing	SNR	SR SMR		ET	NRS NRT	MR3 MR4	GJ RS	MU	RP				SG SX	

※ Periphery grinding type



Comparison table for turning inserts chipbreaker

Comparison table for turning insert chipbreaker

Positive inserts

ISO	Machining range	ZCCCT	SANDVIK	KORLOY	TaeguTec	WALTER	SECO	MITSUBISHI	SUMITOMO	KENAMETAL	DIJET	HITACHI	TUNGALOY	KYOCERA	VALANTTE
P	For finishing	SF, HF	PF, UF XF	HFP	FA, FG FX	PF4 FP4	FF1 F1	FV, SV FP, LP	FP, LU SU, SK	11, UF LF, FP		JQ	PF, PSF PS, PSS	GP, XP VF, PP	PF4 JQ, JZ
	For finishing (Wiper)		WF			PF2※ PF, PF5※	W-F1	SW	LUW SDW	FW				WP	
	For semi-finishing	HM	UM, XM PM, PR XR	HMP C25	MT, PC	PS5 PM5 FP6	F2 MF2, M5	MV, MP	MU	MF, MP	FT	JE	PM 23, 24	HQ, XQ GK MF※	PM2 PM4
	For semi-finishing (Wiper)		WM		WT	PM	W-F2 W-M3	MW		MW					
M	For finishing	EF	MF	HFP		FM4	F1, F2	FM, LM	FC※, SI※ LU, SU	MF		MP	PF, PSF PS, PSS	CF※, CK※ GQ※, GF※ MQ, SK	1A, 2A
	For semi-finishing	EM	MM	HMP C25		MM4 RM4		MM	MU	MP			PM	HQ GK	PM2 PM4
K	For semi-finishing	HM, HR without chip-breaker	KF KM	HMP C25		FK6	F1 M3, M5	MK Without chip-breaker	MU Without chip-breaker	Without chip-breaker			CM Without chip-breaker	Without chip-breaker※	PM2 PM4
S	For finishing/ For semi-finishing	NGF						FS※, LS※ FJ※, FSP※ LS-P※	SL※	LF※ HP※				MQ	PM2, 1A 2A
N	For general turning	LH	AL	TAAK MA	FL	PM2, FN2 MN2	AL※	AZ※	AG	HP※	ALU ACB ASF		AL※	AH※	1L, 1A 2A

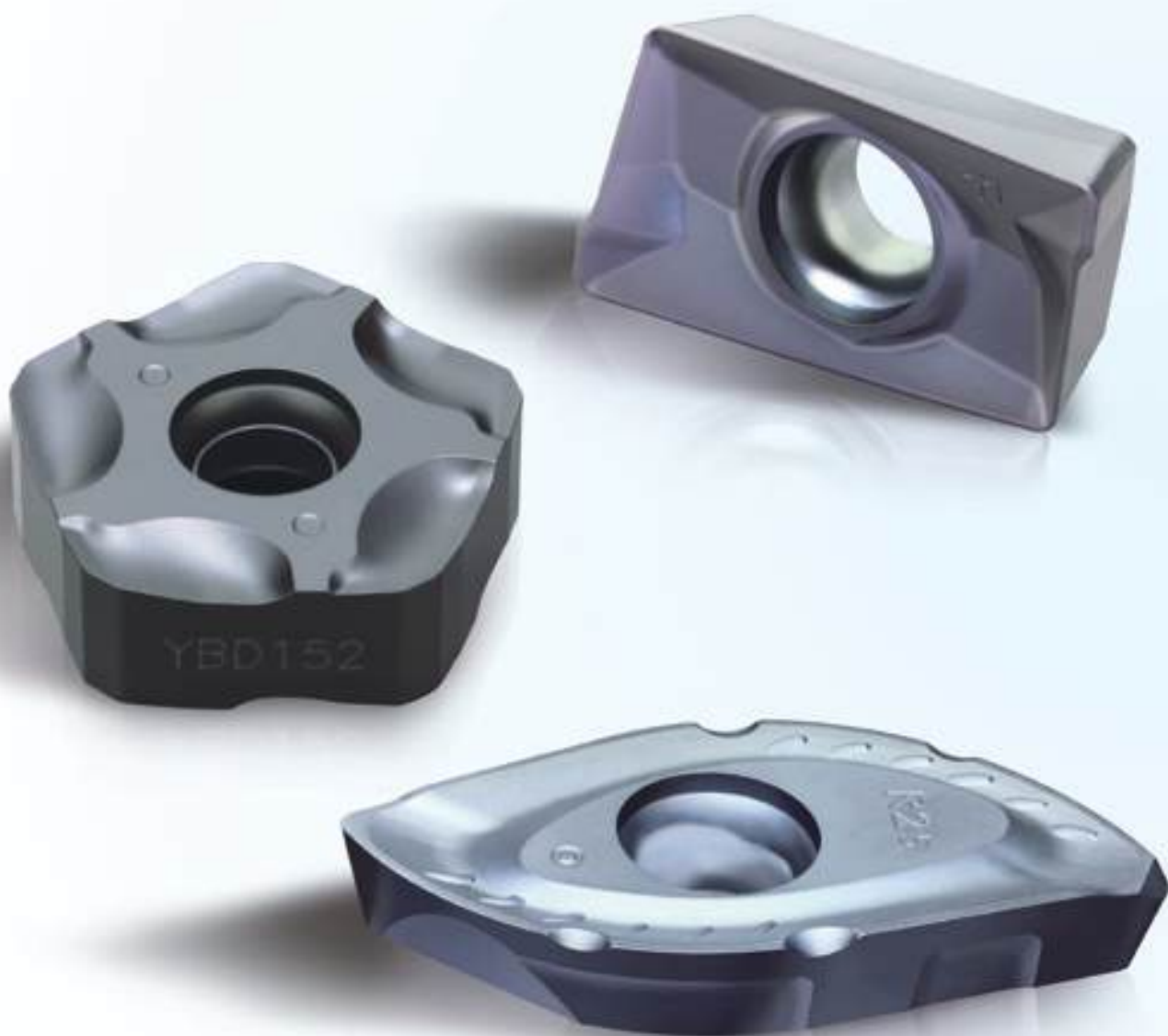
※ Periphery grinding type

Comparison table for turning inserts chipbreaker

Threading

Parting and grooving

General turning



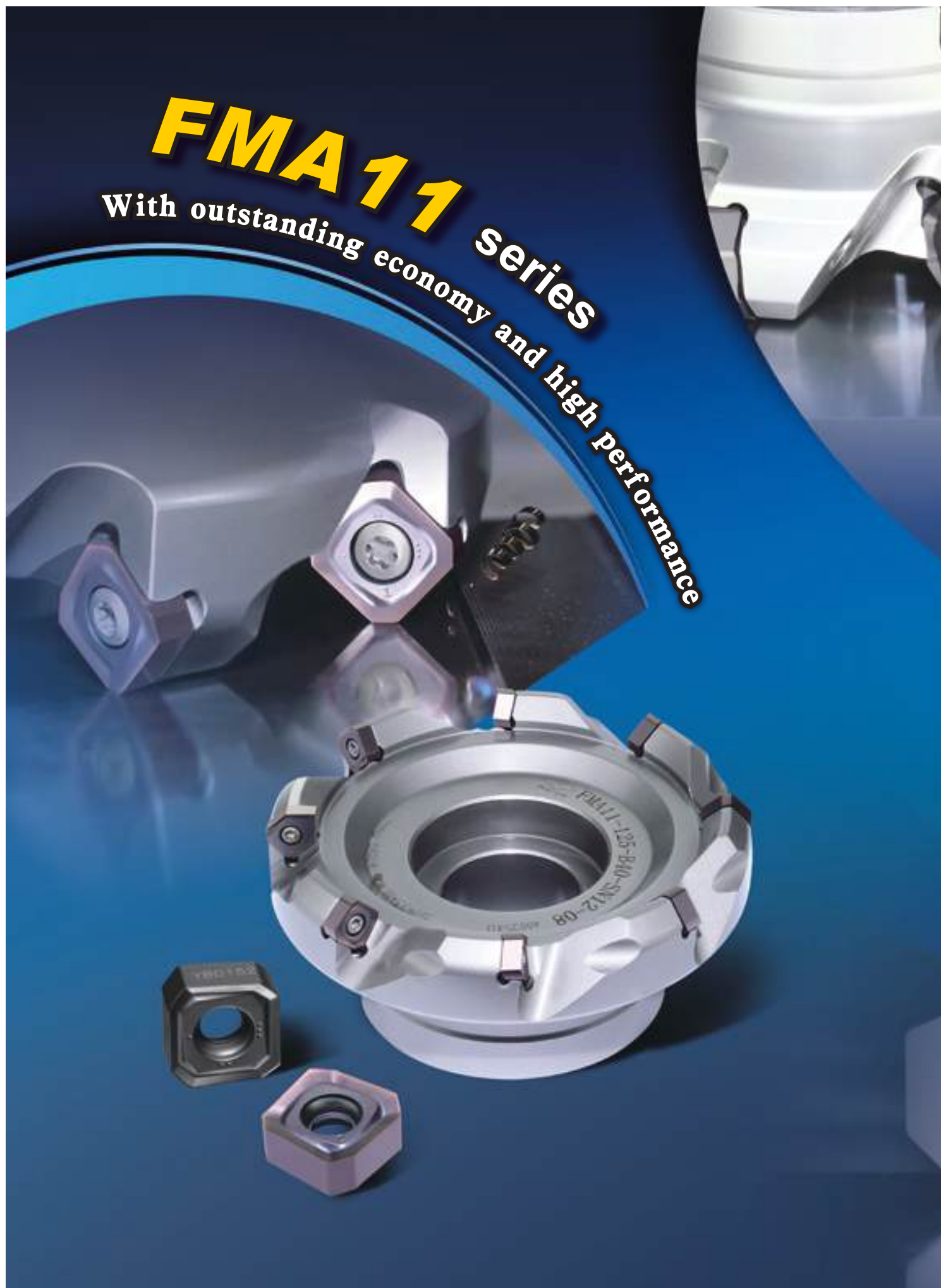


Milling Tools

Indexable milling tools

FMA11 series

With outstanding economy and high performance



FMA12 series

High Performance Face Milling
with 16 edges for outstanding
economy Milling

The image shows a large, silver-colored face mill with 16 cutting edges. It has a central bore and is surrounded by several smaller, similar components. The background is a blue gradient with a circular pattern.

FMA14 series

The image shows a large, silver-colored face mill with 16 cutting edges. It has a central bore and is surrounded by several smaller, similar components. The background is a blue gradient with a circular pattern.



*New generation of the
tangential milling cutter*
EMP09 series

Milling



Indexable Milling Tools

B1-B240

Indexable milling tools

B3-B201

Indexable milling inserts

B202-B233

Technical information

B234-B240

Solid Carbide End Mills

B241-B569

Solid carbide end mills

B241-B562

Technical information

B563-B569

Interchangeable modular
endmills

B570-B590

The image features three diamond inserts at the top: a triangular one on the left, a square one on the right, and an octagonal one in the center. They are all dark grey with a central hole. Below them, a diagonal banner contains the text 'New Champion in Milling' in white, 'YBC302' in large yellow letters, and 'Black Diamond Series grade' in yellow. The bottom half of the image shows a close-up of a milling machine's tool holder and cutting tool, with a diamond insert visible at the cutting point.

New Champion in Milling **YBC302**
Black Diamond Series grade

How to choose the right indexable milling tools

Classification of milling tools

According to types of machining operation

Applicable machining operations

For face milling, chamfering, shoulder milling etc.

Product series

Type of machining

Workpiece materials

Approach angle

Structure and coupling size

Inserts specification

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

Face milling tools

FMA01 P M K N S



Specification of tools

	Type	Stock		Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
		R	L	OD	OD ₁	ed	L	apmax			
FMA01 (series part)	-050-A22-SE12-04	▲	△	50	61	22	40	6	4	A	0.3
	-063-A22-SE12-05	▲	△	63	74	22	40	6	5	A	0.5
	-080-A27-SE12-06	▲	△	80	91	27	50	6	6	A	1.2
	-100-B32-SE12-07	▲	△	100	107	32	50	6	7	B	1.52
	-125-B40-SE12-08	▲	△	125	136	40	63	6	8	B	2.6
	-160-B40-SE12-07	▲	△	160	174	40	63	6	7	B	4.548
	-160-B40-SE12-10	▲	△	160	170	40	63	6	10	B	4.92
	-200-C40-SE12-08	▲	△	200	214	40	63	6	8	C	6.175
	-200-C40-SE12-12	▲	△	200	210	60	63	6	12	C	7.6
	-250-C60-SE12-10	▲	△	250	264	60	63	6	10	C	12.998
	-250-C60-SE12-14	▲	△	250	260	60	63	6	14	C	13.6
	-315-D60-SE12-18	▲	△	315	325	60	70	6	18	D	20.8
	-100-B32-SE18-04	▲	△	100	120	32	63	10.4	4	B	2.22
	-125-B40-SE18-05	▲	△	125	145	40	63	10.4	5	B	3.15
	-160-B40-SE18-06	▲	△	160	180	40	63	10.4	6	B	5.01
	-200-C60-SE18-08	▲	△	200	220	60	63	10.4	8	C	6.9
-250-C60-SE18-10	▲	△	250	270	60	63	10.4	10	C	13.1	
-315-D60-SE18-12	▲	△	315	335	60	80	10.4	12	D	24.6	

▲ Stock available △ Make-to-order

Spare parts

Diameter OD	Insert	Insert screw	Shim	Shim screw	Wrench	Wrench
Ø50-Ø100	SEET120□□□	IS0M3.5×10	—	—	WT15S	WH35L
Ø50-Ø315	SEET120□□□	IS0M3.5×12	S13BS	SM5×7XA	WT15S	WH35L
Ø100-Ø315	SEET180□□□	IS0M5×17	S18BS	SM8×9XA	WT20T	WH50L

Tools code key: 024-025 Grade selection guide: 019-023 Technical data: 0234-0240

Spare parts

Tools specification

Tool shape, dimensions, stock, etc

Tool shape

Assembly of tools and spare parts

Tools code key, reference to grade selection, technical data

Selection of inserts

Insert shape	Type	Basic dimensions(mm)						CVD Coating		PVD Coating		Cement	Cemented carbide
		L	Ø	L	S	pd	bs	R					

SEET12T3-DF	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	SEET12T3-DM	13.4	13.4	3.97	4.1	2.55	—	—	—	—	—	—	—
	SEET12T3-EM	13.4	13.4	3.97	4.1	2.55	—	—	—	—	—	—	—
	SEET18T6-DM	18.0	18.0	6.1	5.5	1.5	—	—	—	—	—	—	—
SEET12T3-DR	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	SEET12T3-W	17.82	13.4	3.97	4.1	9.45	500	—	—	—	—	—	—
	SEET18T6-W	24.79	18.0	6.1	5.5	11.0	900	—	—	—	—	—	—
	SEET18T6-W	24.79	18.0	6.1	5.5	11.0	900	—	—	—	—	—	—

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

Chipbreaker selection for FMA01 milling inserts

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

Chipbreaker selection

How to choose indexable milling inserts

Detailed information for indexable milling inserts

Listed according to insert shape

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

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

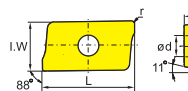
😐 Normal working condition: machine works normally. There are certain requirements for dimensional precision of components and surface quality.

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

Insert shape and size

Insert shape

AP□□



Workpiece material	Good working condition	Normal working condition	Bad working condition
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					Cermel	Cemented carbide										
		L	I.W	S	ød	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YCS3S	YD051	YD101	YD201
	APKT070204-APF	7.32	4.34	2.38	2	0.4		●	●								★											
	APKT11T304-APF	12.24	6.6	3.6	2.8	0.4		●	●								★											
	APKT11T308-APF	12.24	6.6	3.6	2.8	0.8		●	●								★					●	●					
	APKT160408-APF	17.877	9.33	5.76	4.4	0.8		●	●								★					●	●					
	APKT070204-APM	7.32	4.34	2.38	2	0.4			●	●							★											
	APKT11T304-APM	12.24	6.6	3.6	2.8	0.4			●	●							★											
	APKT11T308-APM	12.24	6.6	3.6	2.8	0.8			●	●							★					●	●					
	APKT11T312-APM	12.24	6.6	3.6	2.8	1.2				●							★											
	APKT11T316-APM	12.24	6.6	3.6	2.8	1.6											★											
	APKT11T320-APM	12.24	6.6	3.6	2.8	2.0			●								★											
	APKT160408-APM	17.877	9.33	5.76	4.4	0.8			●	●							★					●	●					
	APKT160416-APM	17.877	9.33	5.76	4.4	1.6			●	●							★					●	●					
	APKT160420-APM	17.877	9.33	5.76	4.4	2.0				●							★											
	APKT160424-APM	17.877	9.33	5.76	4.4	2.4											★											
	APKT160430-APM	17.877	9.33	5.76	4.4	3.0											★											
	APKT11T304-ALH	12.24	6.6	3.6	2.8	0.4																			★	★		
	APKT11T308-ALH	12.24	6.6	3.6	2.8	0.8																			★	★		
	APKT160408-ALH	17.877	9.33	5.76	4.4	0.8																			★	★		

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

Insert grade

Stock condition

Insert shape

Insert dimension

Insert type



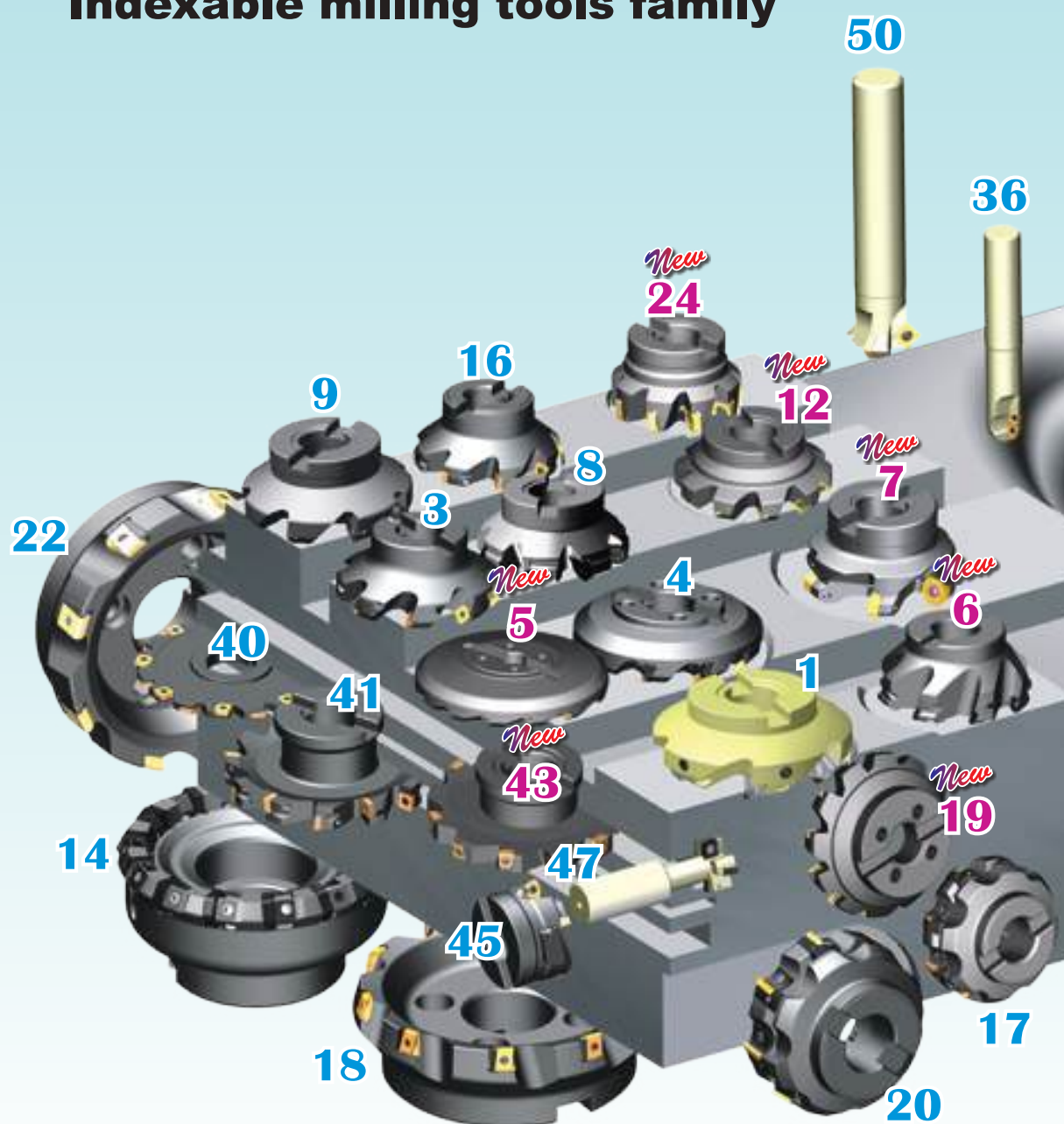
MILLING

Indexable Milling Tools >>>

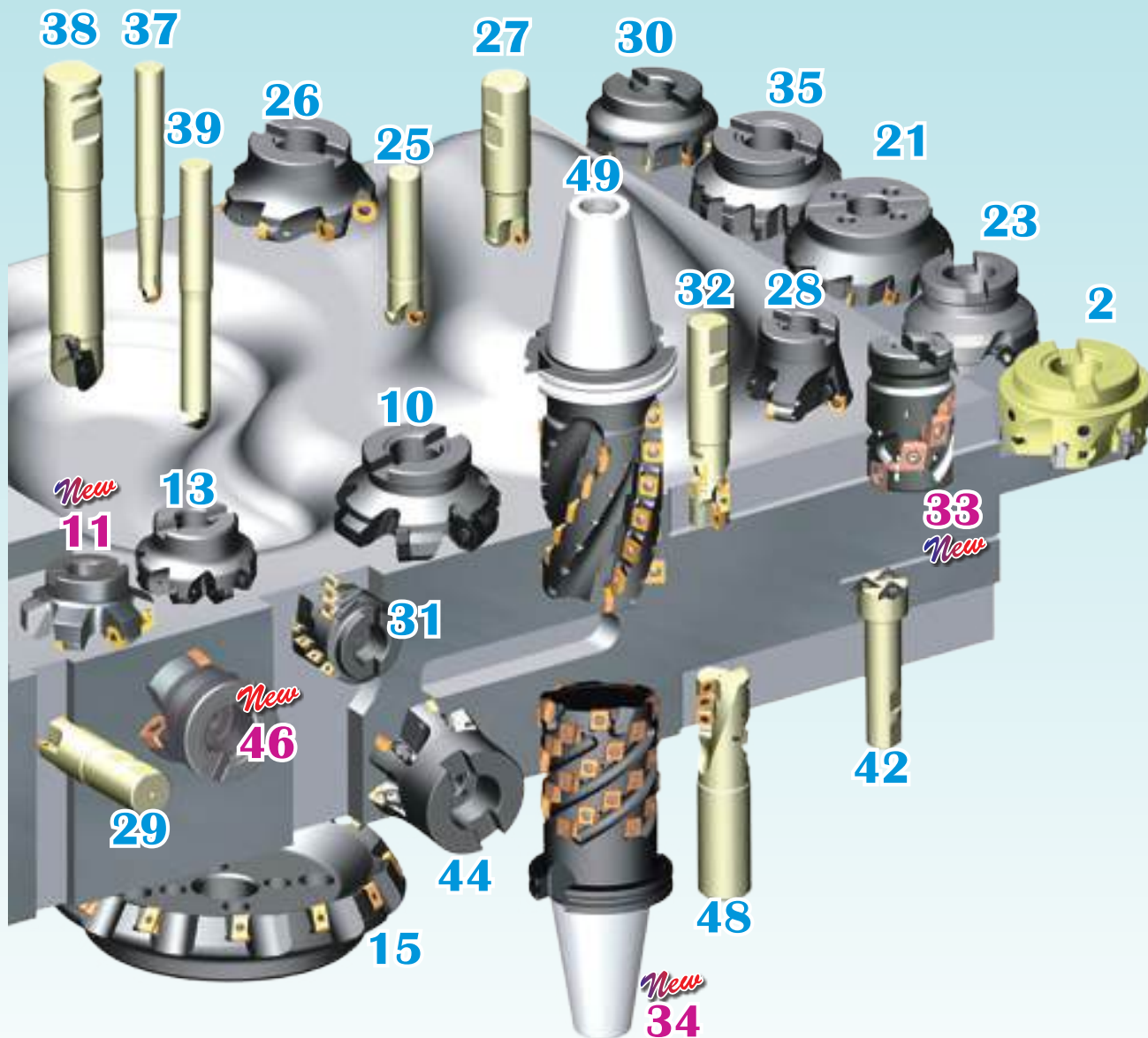


Indexable milling tools family	• B6-B7
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Milling insert grades overview	• B19
Grade classification for milling inserts	• B20-B23
Indexable milling tools code key	• B24-B25
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High-speed High-precision milling tools series	B26-B30
Face milling tool series	B31-B111
Square shoulder milling tool series	B112-B140
Profile milling tool series	B141-B162
Side and face milling series	B163-B177
Special milling tool series (high feed rate)	B178-B190
T-slot milling tool series	B191-B192
Helical end mill series	B193-B197
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Indexable milling tools family



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4	FMA03	B36	13	FMD02(PN11)	B64	22	FMP03	B90
5	FMA03A	B37	14	FMD02(HN09)	B69	23	FMP12	B93
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7	FMA04(ODH/MT06□□)	B42	16	FME02	B73	25	FMR01	B99
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30	EMP02	B118	38	BMR03	B145	47	TMP01	B191
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WHIRLWIND **FMD02**
milling cutter series



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

B MILLING Indexable Milling Tools

Indexable milling tools overview

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

Indexable milling tools

Indexable milling tools overview

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



B MILLING

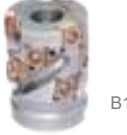
Indexable Milling Tools

Indexable milling tools overview

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

Indexable milling tools

Indexable milling tools overview

Operating pattern	Series/Shape	Approach angle / Max. cutting depth.	Applicable insert	Application overview	Features
Square shoulder milling	EMP02  B118	Kr=90° a _{pmax} =11.5	APKT11T3□□-APF/APM APKT11T3□□-ALH	Face milling of steel, alloy steel, stainless steel, cast iron, aluminum alloy and high-temperature alloy	- Diameter range Ø50-Ø160. - Kr 90° , for square shoulder milling, slot milling, ramp milling, etc. - Inserts with wiper, also suitable for face milling. - Inserts with 3D helical cutting edge, less cutting force.
		Kr=90° a _{pmax} =15.5	APKT160408-APF/APM APKT160408-ALH		
	EMP03  B121	Kr=90° a _{pmax} =39.0	APKT11T3□□-APF/APM APKT11T3□□-ALH	Milling of steel, alloy steel, stainless steel, cast iron, aluminum alloy and high-temperature alloy at high cutting depth	- Diameter range Ø50-Ø100. - End mills with positive helical angle, good chip removal. - For side face milling and slot machining. - Close pitch, high machining efficiency.
	EMP04  B122	Kr=90° a _{pmax} =29.4~58.0	APKT11T3□□-APF/APM APKT11T3□□-ALH	Multi-function drilling and milling of steel alloy steel, stainless steel, cast iron and high-temperature alloy	- Diameter range Ø20-Ø40. - End mills with positive helical angle, good chip removal. - For side face milling and slot machining. - Close pitch, high machining efficiency.
	EMP09 <i>New</i>  B126	Kr=90° a _{pmax} =8.0	LNKT0804□□PNR-GM/GL LNMT080404PNR-GM	Multiple functional milling of steel, alloy steel, stainless steel, cast iron and high-temperature alloy	- Diameter range Ø20-Ø40. - straight shank and tapered shank types. - The tangential inserts with 90-degree clearance angel can be used in square shoulder milling and slotting which can stand more cutting forces.
		Kr=90° a _{pmax} =11.5	LNKT1206□□PNR-GM/GL LNMT120608PNR-GM		
	 B127-128	Kr=90° a _{pmax} =8.0	LNKT0804□□PNR-GM/GL LNMT080404PNR-GM	face milling of steel, alloy steel, stainless steel, cast iron and high-temperature alloy	- Diameter range Ø40-Ø160. - The tangential inserts with 90-degree clearance angel can be used in square shoulder milling and face milling with good rigidity..
		Kr=90° a _{pmax} =11.5	LNKT1206□□PNR-GM/GL LNMT120608PNR-GM		
		Kr=90° a _{pmax} =15	LNKT1607□□PNR-GM/GL LNMT160708PNR-GM		
	 B129	Kr=90° a _{pmax} =33~63	LNKT1206□□PNR-GM/GL LNMT120608PNR-GM		- Diameter range Ø32-Ø100. - Used in side milling and slotting.. - The helical cutting edge design lead to light cut.
		Kr=90° a _{pmax} =30~53	LNKT0804□□PNR-GM/GL LNMT080404PNR-GM LNKT1206□□PNR-GM/GL LNMT120608PNR-GM		- Diameter range Ø25-Ø50. - High strength on the cutting edge with sharp cutting edge. - Used in side milling and slotting. - The tangential inserts could stand more cutting forces.
	EMP09 BT <i>New</i>  B131	Kr=90° a _{pmax} =63~125	LNKT1206□□PNR-GM/GL LNMT120608PNR-GM	large cutting depth milling of steel, alloy steel, stainless steel, cast iron and high-temperature alloy	- Diameter range Ø50-Ø80. - High strength on the cutting edge with sharp cutting edge. - Used in side milling and slotting. - The tangential inserts could stand more cutting forces.
	EMP09 JT <i>New</i>  B132	Kr=90° a _{pmax} =85~125			

B MILLING Indexable Milling Tools

Indexable milling tools overview

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

Indexable milling tools

Indexable milling tools overview

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



B MILLING

Indexable Milling Tools

Indexable milling tools overview

Operating pattern	Series/Shape	Approach angle / Max. cutting depth.	Applicable insert	Application overview	Features
Special milling (high feed)	XMR01  B178	cutting depth: see the detailed information about tool specifications	SDMT□□-DM/PM/NM	Slot milling of steel, stainless steel and cast iron	• Diameter range Ø20-Ø160. • Two mounting types: straight shank and arbor mounting. • Cutting forces are resolved effectively, achieving cutting with high feed rate. • For plunge milling. • Double clamping, firm and reliable.
	 B179				
	 B181		WPGT□□ZSR WPGT□□ZSR-PM	Face and cavity profile milling of steel, stainless steel and cast iron in cavity applications	• Diameter range Ø20-Ø160. • Two mounting types: straight shank and arbor mounting. • Cutting forces are resolved effectively, achieving cutting with high feed rate. • Double clamping, firm and reliable.
	 B182				
	XMR03   B189		SNGU□□-GM	cavity milling, face milling of steel, alloy steel, stainless steel, and cast iron	• Diameter range Ø50-Ø125 • double-sided inserts with 8 cutting edges and great economical effect. • Large rake angle design leads to low cutting resistance with high generality. • The overall impact resistance of the tool is outstanding. • Great anti-vibration ability and stable machining.
T-slot milling	TMP01  B191	Kr=90° apmax=9~28	MPHT□□	Machining T slot in cast iron	• Diameter range Ø21-Ø60. • Machining T-slot with nominal size 12, 14, 18, 22, 28, 36. • 86° rhombic inserts with positive angle.
Helical end mills	HMP01  B193	Kr=90° apmax=55	APKT150412-PM/KM SPMT120408-PM/KM	Milling of steel, alloy steel and cast iron at high cutting depth.	• Diameter range Ø40、Ø80. • Coarse and differential pitch, less vibration. • Holistic structure with good rigidity, interchangeable heads achieve high economical efficiency.
	 B194	Kr=90° apmax=74~144			
	HMP01 EC  B195	Kr=90° apmax=74~144			

Indexable milling tools

Indexable milling tools overview

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



***Profile milling tools
series***

Milling insert grades overview

Workpiece material	ISO code	Coating		Cermet	Cemented carbide	PCBN and PCD material
		CVD	PVD			
P Steel	P01					
	P10			YNG151 YNG151C		
	P20	YBC301 YBC302 YBM251	YBG202 YBG205 YB9320			
	P30	YBM351	YBG252 YBG302		YC30S	
	P40					
M Stainless steel	M01					
	M10	YBM251 YBC302 YBM351 YBM253	YBG202 YBG205 YB9320 YBG252	YNG151 YNG151C		
	M20					
	M30		YBG302		YC30S	
	M40					
K Cast iron	K01					BK1021 BK1041
	K10	YBD152	YBG102	YNG151 YNG151C	YD051	
	K20	YBD252	YBG152 YBG252		YD201	BK2531
	K30					
	K40					
N Non ferrous metal	N01					DN1021
	N10				YD101	
	N20				YD201	
	N30					
S Heat resistant alloy & Ti alloy	S01					
	S10		YBG202 YBS203			
	S20		YBS303			
	S30					
H Super hard material	H01					
	H10					
	H20					
	H30					

Indexable milling tools

Indexable milling tools overview



B MILLING Indexable Milling Tools

Grade classification for milling inserts

Coated Cemented Carbide



Grade	Coating structure	Micro-structure	ISO applied range	Application field
YBC301	Combination of high-toughness, high-strength substrate and coating composed of TiCN, thin Al ₂ O ₃ and TiN		P15~35	Suitable for semi-finish and rough milling of P-type material
YBC302	Combination of high toughness, high strength substrate and coating composed of TiCN, thin Al ₂ O ₃ and TiN		P15~35 M10~30	Suitable for rough and semi-finish milling of P-type, M-type, whose hardness is below HRC45 and under
YBM251	Combination of high-toughness, high-strength substrate and coating composed of TiCN, thin Al ₂ O ₃ and TiN		P15~40 M10~30	Suitable for semi-finish and rough milling of P- and M-type material
YBM253	Combination of high-toughness gradient substrate and coating composed of TiCN and ultra fine Al ₂ O ₃		M10~30	Suitable for rough milling of M-type material
YBM351	Combination of high-toughness substrate and coating composed of TiCN, thin Al ₂ O ₃ and TiN		P25~40 M20~35	Suitable for rough milling of P- and M-type material
YBD152	Good combination of substrate with high wear-resistance and coating composed of TiCN and thick Al ₂ O ₃		K05~25	Suitable for finish and semi-finish milling of K-type material
YBD252	Good combination of substrate with high wear-resistance and coating composed of TiCN and thick Al ₂ O ₃		K15~35	Suitable for rough and semi-finish milling of K-type material

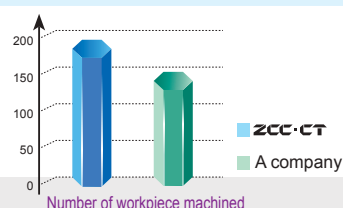
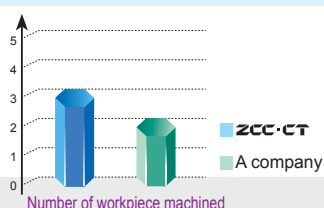
Application case

Component shape



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

Application results



Coated Cemented Carbide PVD

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

Application case

Component shape



Machine and cooling

Machining center, dry cutting

Plane milling machine, dry cutting

Workpiece material and hardness

Nodular cast iron HB 220

7CrSiMoV HRC25

Type of machining

Milling surface

Cavity milling

Applicable tool

EMP02-050-A22-AP11-06

BMR03-050-MT5-M

Applicable insert

YB9320/APKT11T308-APM

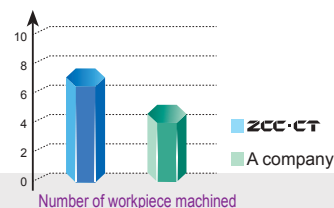
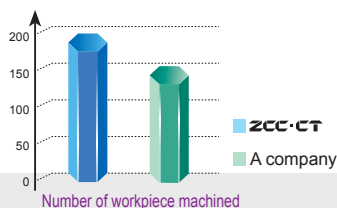
YBG302/XPHT50R2507- GM

Cutting parameters

Vc=235m/min, fz=0.15mm/z, ap=1~3mm

Vc=120m/min, fz=0.25mm/z, ap=8mm

Application results



Indexable milling tools

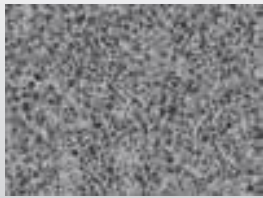
Grade classification for milling inserts



B MILLING / Indexable Milling Tools

Grade classification for milling inserts

Germet

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

Indexable
milling tools

Grade classification for milling inserts

Application case

Component shape



Machine and cooling

Machining center, dry cutting

Machining center, dry cutting

Workpiece material and hardness

45# HB 170~220

NAK80 HRC42~48

Type of machining

Finish milling surface

Finish milling surface

Applicable tool

FMA03-160-B40-SE12-08

FME03-160-B40-SP12-10

Applicable insert

YNG151/SEEN1203AFTN

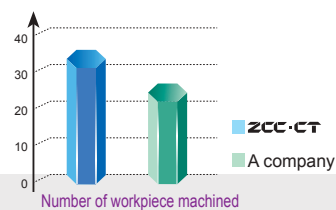
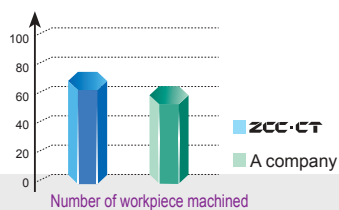
YNG151C/SPEN1203EDER

Cutting parameters

$V_c=400\text{m/min}$, $f_z=0.1\text{mm/z}$, $a_p=0.3\text{mm}$

$V_c=420\text{m/min}$, $f_z=0.12\text{mm/z}$, $a_p=0.35\text{mm}$

Application results



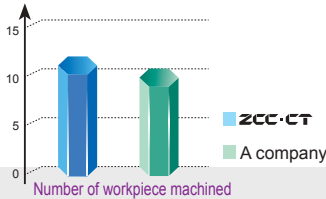
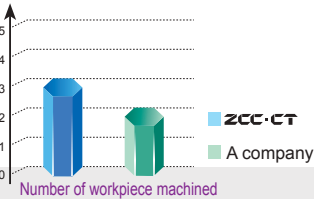
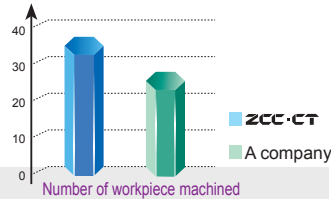
Cemented Carbide

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

Indexable milling tools

Grade classification for milling inserts

Application case

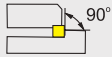
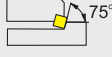
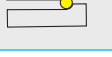
Component shape			
Machine and cooling	Vertical machining center, wet machining	Plane milling machine, wet machining	plane milling machine, dry cutting
Workpiece material and hardness	Aluminum alloy HB100	40CrMnMo HB240	HT250 HB220
Type of machining	Milling surface	Milling surface	Milling surface
Applicable tool	FMA01-100-B32-SE12-07	FMP01-100-B32-TP22-06	FME03-160-B40-SP15-10
Applicable insert	YD101/SEET12T3-LH	YC30S/TPKN2204PDR	YD201/SPKN1504EDTR
Cutting parameters	$V_c=300\sim350\text{m/min}$, $a_p=1\sim2\text{mm}$, $f_z=0.2\text{mm/z}$	$V_c=170\text{m/min}$, $a_p=5\sim7\text{mm}$, $f_z=0.3\text{mm/z}$	$V_c=100\sim130\text{m/min}$, $a_p=7\text{mm}$, $f_z=0.35\text{mm/z}$
Application results	 Number of workpiece machined	 Number of workpiece machined	 Number of workpiece machined



MILLING

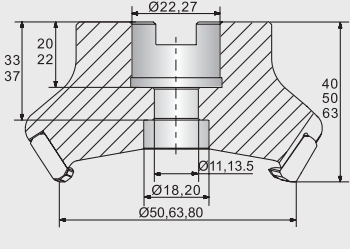
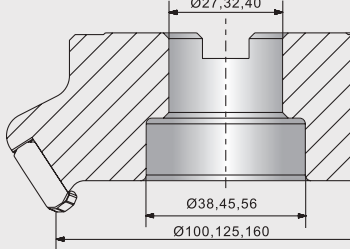
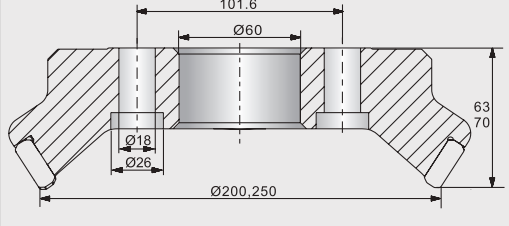
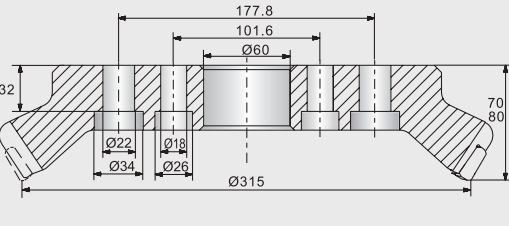
Indexable Milling Tools

Indexable milling tools code key

Cutter type		Approach angle		Series code	
FM	Face milling	P	90° 	Cutting diameter ØD Side and face milling tool : diameter X cutting edge width	
EM	Square shoulder milling	E	75° 	Coupling structure (see below)	
HM	Helical end milling	D	60° 	A	A-type coupling XP Weldon shank
SM	Side and face milling	A	45° 	B	B-type coupling G Straight shank
BM	Profile milling	R		C	C-type coupling MW Morse adapter with a conical hole and without a flat tail
CM	Chamfer milling			D	D-type coupling
XM	Special milling			Coupling size(mm) (see below)	
TM	T-slot milling				
AM	Aluminum alloy high speed milling				

FM **E** **03** - **100** - **B** **32**

Coupling structure of arbor

A-type coupling		B-type coupling	
	Ø50- Ø80 arbor face milling cutter as per GB5342-96		Ø100- Ø160 arbor face milling cutter as per GB5342-96
C-type coupling		D-type coupling	
	Ø200- Ø250 arbor face milling cutter as per GB5342-96		D≥Ø315 arbor face milling cutter as per GB5342-96

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

Insert shape	
	
	
	
	

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

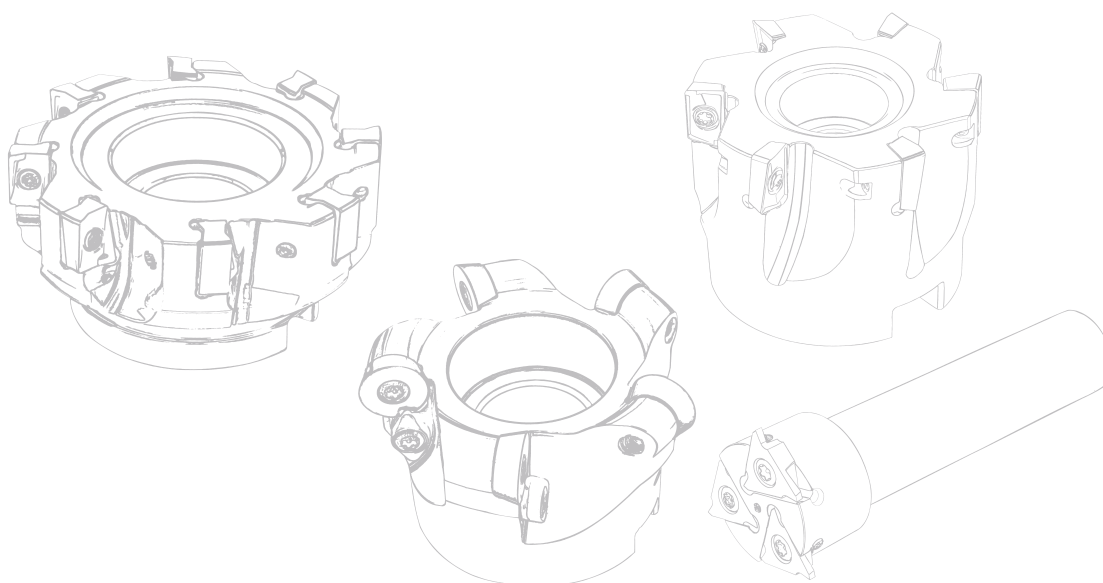
Diameter of insert's inscribed circle	Length of cutting edge					
	C	D	R	S	T	L
5.556	—	—	—	—	09	—
6.350	06	07	—	—	11	—
9.525	09	11	09	09	16	—
12.700	12	15	12	12	22	—
15.875	16	19	15	15	27	—
19.050	19	—	19	19	33	—
25.400	25	—	25	25	44	2

- S P 12 - 06 L C

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

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

Internal cooling structure


Indexable
milling tools

Indexable milling tools code key

AMMA01 AMP01 Series

High-speed High-precision
milling tools

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

Area of machining: Bottom surface of cylinder
housing

Machine: Machining center

Coolant: Internal

Workpiece material: Aluminum alloy (HB 110)

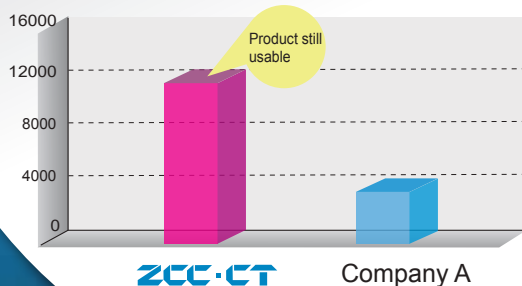
Operation: Face milling

Cutting data: $n = 11141 \text{ r/min}$ $f_z = 0.1 \text{ mm/z}$



● Comparison of tool life

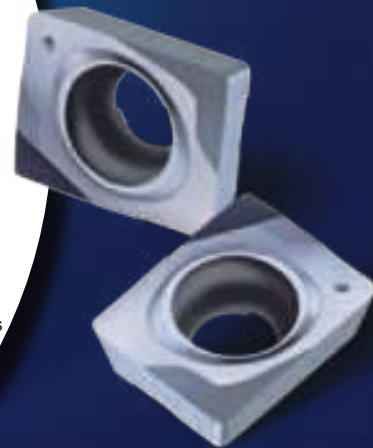
Number of workpiece machined(pieces)



Results:

ZCC-CT: 12000 pcs
(Still usable)

Product of company A: 3500 pcs



AMA01 Series High-speed High-precision milling tools

Kr:45°



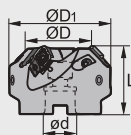
Face milling



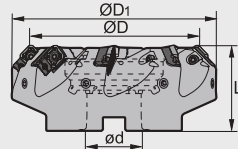
Chamfering

AMA01 **N** **K**

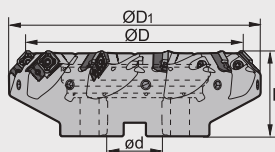
A-type coupling



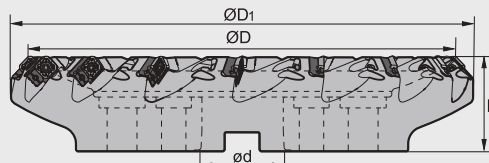
B-type coupling



C-type coupling



D-type coupling



Specification of tools

Type	Stock		Basic dimensions(mm)				Number of teeth Z	Type of coupling	Weight (kg)
	R	L	ØD	ØD ₁	ød	L			
AMA01 -050-A22-SE12-03C	▲	△	50	64	22	40	3	A	0.17
-063-A27-SE12-04C	▲	△	63	77	27	40	4	A	0.27
-080-A27-SE12-05C	▲	△	80	94	27	50	5	A	0.49
-100-A32-SE12-06C	▲	△	100	114	32	50	6	A	0.84
-125-B40-SE12-08C	▲	△	125	139	40	63	8	B	1.20
-160-B40-SE12-10C	▲	△	160	173	40	63	10	B	2.11
-160-C40-SE12-10C	▲	△	160	173	40	63	10	C	2.15
-200-C60-SE12-12C	▲	△	200	213	60	63	12	C	3.36
-250-C60-SE12-14C	▲	△	250	263	60	63	14	C	4.96
-315-D60-SE12-16	▲	△	315	328	60	80	16	D	8.68
-400-D60-SE12-18	▲	△	400	413	60	80	18	D	10.1
-500-D60-SE12-20	▲	△	500	513	60	80	20	D	14.3

▲Stock available

△Make-to-order

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

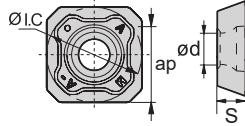
Spare parts

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

Tools code key
B24-B25Grade selection guide
B19-B23Technical data
B234-B240

B MILLING Indexable Milling Tools

Selection of inserts



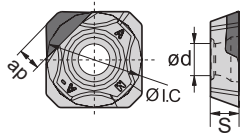
😊 Good working condition 😐 Normal working condition ☹️ Bad working condition

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

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

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

Selection of inserts



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

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

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

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

Recommended cutting parameters

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

Indexable
milling tools

High-speed High-precision milling tools

AMA01 Series High-speed High-precision milling tools

Kr:90°



Face milling

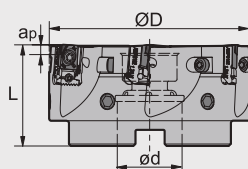


Step shoulder

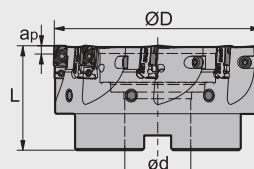
AMP01 N K

Close even pitch

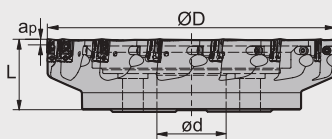
A-type coupling



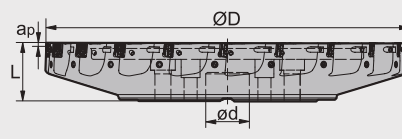
B-type coupling



C-type coupling



D-type coupling



Specification of tools

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

▲Stock available

△Make-to-order

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

Spare parts

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



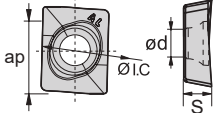
Tools code key
B24-B25Grade selection guide
B19-B23Technical data
B234-B240Indexable
milling tools

High-speed High-precision milling tools

B MILLING Indexable Milling Tools

Selection of inserts

Good working condition
 Normal working condition
 Bad working condition



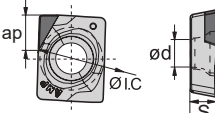
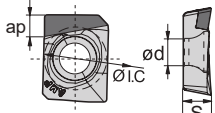
Workpiece material	Cast iron (K)	Non-ferrous metal (N)
Good working condition		
Normal working condition		
Bad working condition		

Insert shape	Type	Basic dimensions(mm)				PCD	PCBN	Cemented carbide
		Øl.c	S	Ød	apmax			
		Øl.c	S	Ød	apmax	DN1021	BK1021	YD201
	APHT12T304PPFR-AL	12.7	3.97	4.4	12			★

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

Selection of inserts

Good working condition
 Normal working condition
 Bad working condition

Workpiece material	Cast iron (K)	Non-ferrous metal (N)
Good working condition		
Normal working condition		
Bad working condition		

Insert shape	Type	Basic dimensions(mm)				PCD	PCBN	Cemented carbide
		Øl.c	S	Ød	apmax			
		Øl.c	S	Ød	apmax	DN1021	BK1021	YD201
	APHT12T304PPFR-PCD	12.7	3.97	4.4	3	★		
	APHT12T304PPFR-CBN	12.7	3.97	4.4	2		○	
	APHT12T304-W	12.7	3.97	4.4	1	★	★	

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

Recommended cutting parameters

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

Face milling tools

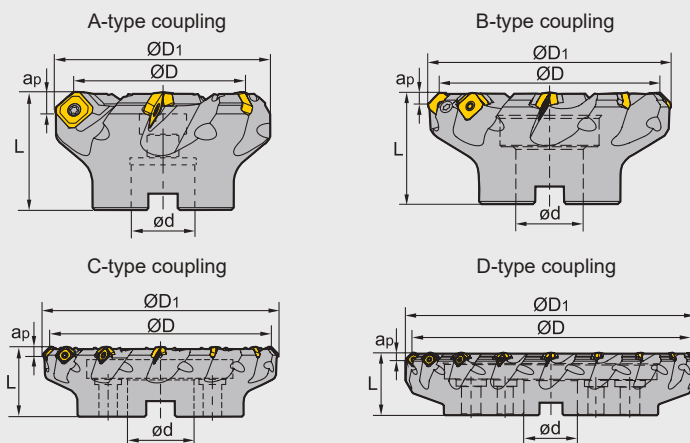
Kr:45°



Face milling



Chamfering

FMA01 P M K N S

Specification of tools

Type		Stock		Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
		R	L	ØD	ØD ₁	ød	L	apmax			
FMA01 Coarse pitch	-050-A22-SE12-04	▲	△	50	61	22	40	6	4	A	0.3
	-063-A22-SE12-05	▲	△	63	74	22	40	6	5	A	0.5
	-080-A27-SE12-06	▲	△	80	91	27	50	6	6	A	1.2
	-100-B32-SE12-07	▲	△	100	107	32	50	6	7	B	1.52
	-125-B40-SE12-08	▲	△	125	136	40	63	6	8	B	2.6
	-160-B40-SE12-07	▲	△	160	174	40	63	6	7	B	4.548
	-160-B40-SE12-10	▲	△	160	170	40	63	6	10	B	4.92
	-200-C60-SE12-08	▲	△	200	214	60	63	6	8	C	6.175
	-200-C60-SE12-12	▲	△	200	210	60	63	6	12	C	7.6
	-250-C60-SE12-10	▲	△	250	264	60	63	6	10	C	12.596
	-250-C60-SE12-14	▲	△	250	260	60	63	6	14	C	13.5
	-315-D60-SE12-18	▲	△	315	325	60	70	6	18	D	20.8
	-100-B32-SE18-04	▲	△	100	120	32	63	10.4	4	B	2.22
	-125-B40-SE18-05	▲	△	125	145	40	63	10.4	5	B	3.15
	-160-B40-SE18-06	▲	△	160	180	40	63	10.4	6	B	5.01
	-200-C60-SE18-08	▲	△	200	220	60	63	10.4	8	C	6.9
-250-C60-SE18-10	▲	△	250	270	60	63	10.4	10	C	13.1	
-315-D60-SE18-12	▲	△	315	335	60	80	10.4	12	D	24.5	

▲Stock available

△Make-to-order

Spare parts

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

Tools code key
B24-B25Grade selection guide
B19-B23Technical data
B234-B240



B MILLING

Indexable Milling Tools

Face milling tools

Kr:45°



Face milling

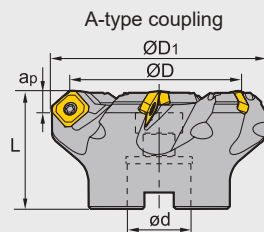


Chamfering

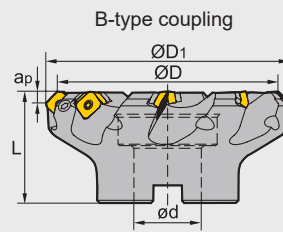
FMA01 **P** **M** **K** **N** **S**



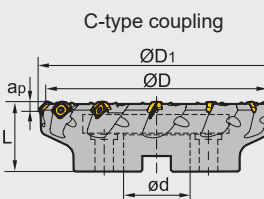
Close and equal pitch



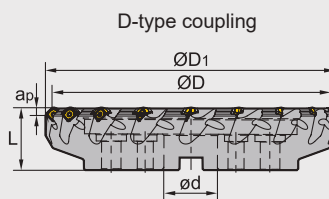
A-type coupling



B-type coupling



C-type coupling



D-type coupling

Specification of tools

Type		Stock		Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
		R	L	ØD	ØD ₁	ød	L	a _p max			
FMA01 Close pitch	-050-A22-SE12-05	▲	△	50	63	22	40	6	5	A	0.427
	-063-A22-SE12-06	▲	△	63	74	22	40	6	6	A	0.53
	-080-A27-SE12-08	▲	△	80	93	27	50	6	8	A	1.37
	-100-B32-SE12-10	▲	△	100	114	32	50	6	10	B	1.755
	-125-B40-SE12-12	▲	△	125	136	40	63	6	12	B	3.06
	-160-B40-SE12-16	▲	△	160	174	40	63	6	16	B	5.21
	-200-C60-SE12-20	▲	△	200	214	60	63	6	20	C	9.32
	-250-C60-SE12-24	▲	△	250	264	60	63	6	24	C	15.892
	-100-B32-SE18-06	▲	△	100	114	32	63	10.4	6	B	2.98
	-125-B40-SE18-07	▲	△	125	144	40	63	10.4	7	B	3.803
	-200-C60-SE18-12	▲	△	200	220	60	63	10.4	12	C	7.191
	-250-C60-SE18-14	▲	△	250	265	60	63	10.4	14	C	14.9

▲Stock available

△Make-to-order

Spare parts

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

Tools code key

B24-B25

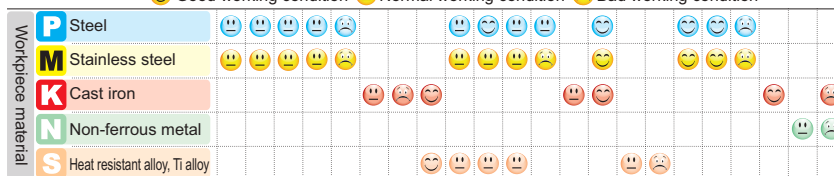
Grade selection guide

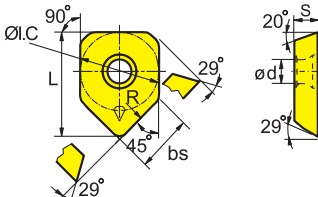
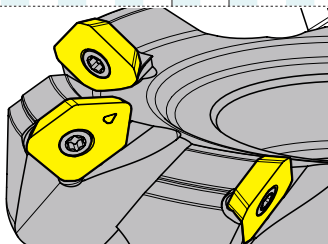
B19-B23

Technical data

B234-B240

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



Insert shape	Type	Basic dimensions(mm)						CVD Coating						PVD Coating						Cermet		Cemented carbide							
		L	ØI.C	S	ød	bs	R	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SEET12T3-DF	13.4	13.4	3.97	4.1	2.55	--	●	★	●						★	○												
	SEET12T3-CF	13.4	13.4	3.97	4.1	2.55	--						○	★		★	○												
	SEET12T3-EF	13.4	13.4	3.97	4.1	2.55	--										★	○					●						
	SEET12T3-DM	13.4	13.4	3.97	4.1	2.55	--	●	★	●		○				★	★												
	SEET12T3-CM	13.4	13.4	3.97	4.1	2.55	--						★			★	○												
	SEET12T3-EM	13.4	13.4	3.97	4.1	2.55	--			●		●				★	★					●							
	SEET18T6-DM	18.0	18.0	6.1	5.5	1.5	--		○		○																		
	SEET18T6-EM	18.0	18.0	6.1	5.5	1.5	--				○							○											
	SEET12T3-DR	13.4	13.4	3.97	4.1	2.55	--	●	★			●				★	★												
	SEET12T3-CR	13.4	13.4	3.97	4.1	2.55	--	●					★			★	★												
	SEET12T3-LH	13.4	13.4	3.97	4.1	2.55	--																				○	★	
	SEET12T3-W	17.82	13.4	3.97	4.1	9.46	500	★	●			★				★							★						
	SEET18T6-W	24.78	18.0	6.1	5.5	11.0	500										○												
																													

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

Face milling tools





►► Chipbreaker selection for FMA01 milling inserts

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

►► Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters			
				V _c (m/min)	f _z (mm/z)		
					-DF	-DM	-DR
P	Low-carbon steel, Soft steel	≤180	YBM251 YBC301	270(220-350)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
			YBG205 YB9320	270(200-360)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
			YBG302 YBM253	230(170-350)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
	High-carbon steel, Alloy steel	180-280	YBM251 YBC302 YBC301	240 (200-320)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
			YBG205 YB9320	240 (180-350)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
			YBG302 YBM253	220 (150-330)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
	Alloy tool steel	280-350	YBM251 YBM351 YBC301	220 (180-300)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
			YBG205 YB9320	220 (170-340)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
			YBG302 YBM253	190 (130-300)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
M					-EF	-EM	
	Stainless steel	≤270	YBM251	150 (120-240)	0.15(0.1-0.2)	0.2 (0.1-0.3)	
			YBG205 YB9320	160 (110-270)	0.15(0.1-0.2)	0.2 (0.1-0.3)	
			YBG302	140 (100-250)	0.15(0.1-0.2)	0.2 (0.1-0.3)	
K					-CF	-CM	-CR
	Cast iron	180-250	YBG102	210 (120-300)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
			YBD152	240 (180-300)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
N					-LH		
	Al alloy steel	--	YD101	300-	0.25 (0.1-0.4)		
			YD201	300-			
S					-EF	-EM	
	High-temperature alloy	≤400	YBG102	50(20-60)	0.1 (0.1-0.2)	0.15 (0.1-0.3)	
			YBS303	100(60-120)	0.1 (0.1-0.2)	0.15 (0.1-0.25)	

Indexable
milling tools

Face milling tools

Case for FMA01



Workpiece material: 1Cr18Ni9Ti (HB180)
 Cooling system: Dry cutting
 Machine: Vertical machining center
 Cutting parameters:
 $V_c=160\text{m/min}$
 $a_p=1\text{mm}$
 $f_z=0.2\text{mm/z}$
 $a_e=60\text{mm}$

Surface roughness of workpiece:

ZCC-CT: Ra1.2

Similar overseas products:
 Ra1.6



Tool type: FMA01-080-A27-SE12-06

Insert type/grade: SEET12T3-EM/YBG302

Indexable
milling tools

Face milling tools

● Comparison of insert abrasion

ZCC-CT

Similar overseas products

17'30"



29'30"



33'30"





B MILLING

Indexable Milling Tools

Face milling tools

Kr:45°



Face milling

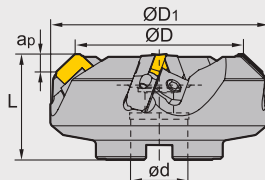


Chamfering

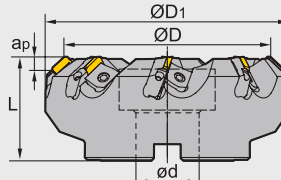
FMA03 P M K



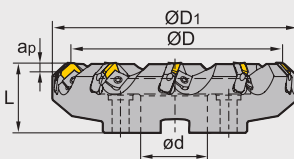
A-type coupling



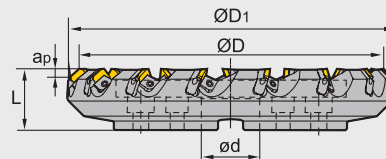
B-type coupling



C-type coupling



D-type coupling



Specification of tools

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

▲Stock available

△Make-to-order

Spare parts

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

Tools code key

B24-B25

Grade selection guide

B19-B23

Technical data

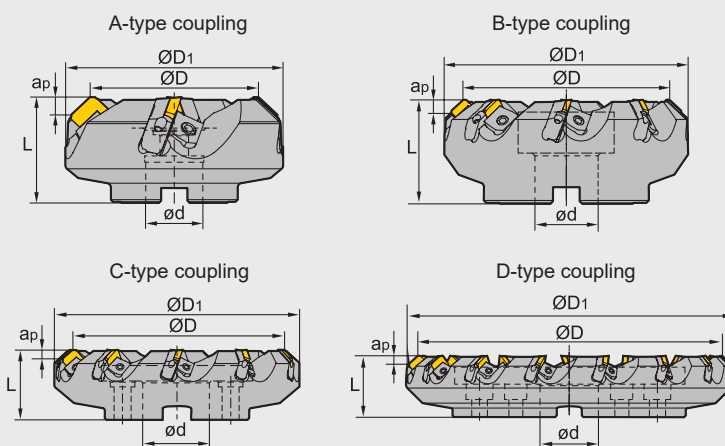
B234-B240

Face milling tools

Kr:45°



FMA03A P M K



Specification of tools

Type	Stock		Basic dimensions(mm)						Number of teeth Z	Type of coupling	Weight (kg)
	R	L	ØD	ØD ₁	ød	L	ap _{max}				
FMA03A -160-B2.00"-SE12-08R/L	▲	△	160	177	2.00"	63	5.5	8	B	6.9	
-200-C1.875"-SE12-10R/L	▲	△	200	217	1.875"	63	5.5	10	C	9.1	
-250-C1.875"-SE12-12R/L	▲	△	250	267	1.875"	63	5.5	12	C	14.6	
-315-C1.875"-SE12-14R/L	▲	△	315	332	1.875"	63	5.5	14	C	22.7	
-350-C1.875"-SE12-16R/L	▲	△	350	367	1.875"	63	5.5	16	C	28.9	
-250-C1.875"-SE15-12R/L	▲	△	250	267	1.875"	63	7.5	12	C	7.3	
-315-C1.875"-SE15-14R/L	▲	△	315	340	1.875"	63	7.5	14	C	9.5	
-350-C1.875"-SE15-16R/L	▲	△	350	370	1.875"	63	7.5	16	C	15.1	

▲Stock available △Make-to-order

1.875"=47.625mm 2.00"=50.8mm

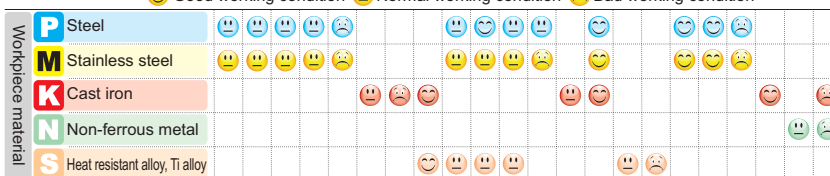
Cutter diameter Insert type Left cutter
FMA03A - 160 - B2.00" - SE12 - 08R/L
 Cutter type Coupling type Right cutter

Spare parts

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

Tools code key
B24-B25Grade selection guide
B19-B23Technical data
B234-B240

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

[illegible]

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

► Recommended cutting parameters

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



MILLING

Indexable Milling Tools

Face milling tools

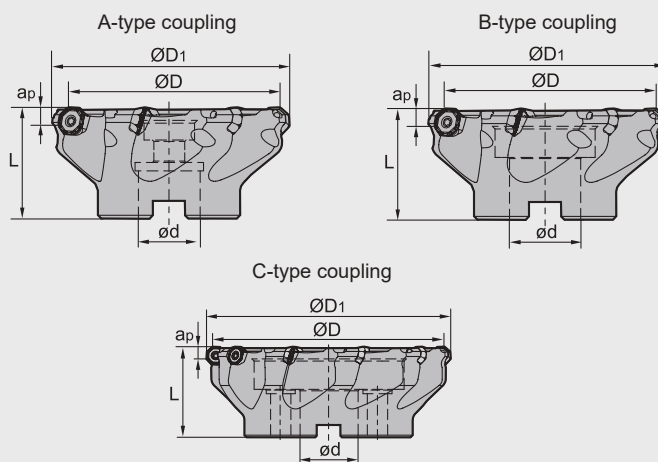
Kr:45°



FMA04 P M K N



Screw clamping



Specification of tools

Type	Stock		Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
	R	L	ØD	ØD1	ød	L	apmax			
FMA04 -050-A22-OF05-04	▲	△	50	56	22	40	3.5	4	A	0.3
-050-A22-OF05-05	△	△	50	56	22	40	3.5	5	A	0.4
-063-A22-OF05-05	▲	△	63	69	22	40	3.5	5	A	0.5
-080-A27-OF05-06	▲	△	80	86	27	50	3.5	6	A	0.8
-100-B32-OF05-07	▲	△	100	106	32	50	3.5	7	B	1.2
-125-B40-OF05-08	▲	△	125	130	40	63	3.5	8	B	2.7
-160-B40-OF05-10	▲	△	160	165	40	63	3.5	10	B	5.1
-160-C40-OF05-10	△	△	160	165	40	63	3.5	10	C	4.1

▲Stock available

△Make-to-order

Spare parts

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

Tools code key

B24-B25

Grade selection guide

B19-B23

Technical data

B234-B240

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

Workpiece material	Casting					Forming					Joining					Finishing				
	Stamping	Die casting	Investment casting	Sand casting	Lost foam casting	Forging	Rolling	Extrusion	Drawing	Sheet metal forming	Welding	Adhesive bonding	Fastening	Grinding	Turning	Milling	Drilling	Boring		
P Steel	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊		
M Stainless steel	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊		
K Cast iron						😞	😞	😞			😞	😞						😞		
N Non-ferrous metal																		😊		
S Heat resistant alloy, Ti alloy						😊	😊	😊	😊		😊	😊		😊	😊					

[illegible]

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

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

Face milling tools

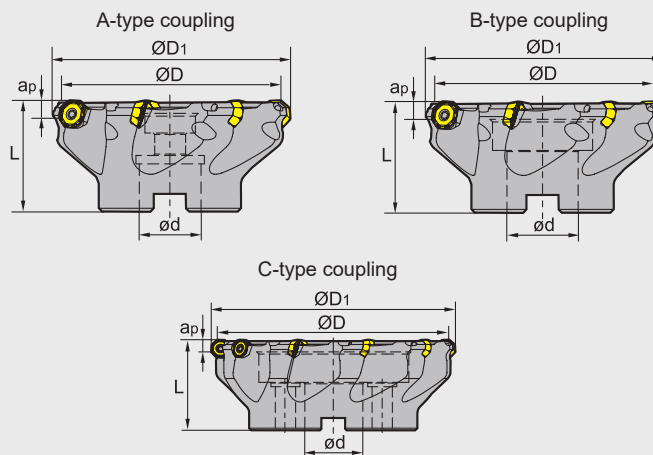
Kr:45°



FMA04 P M K N S



Screw clamping



Specification of tools

Type	Stock		Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
	R	L	ØD	ØD1	ød	L	apmax			
FMA04 Coarse pitch	▲	△	50	60	22	40	4	4	A	0.284
	▲	△	63	73	22	40	4	5	A	0.409
	▲	△	80	90	27	50	4	6	A	1.017
	▲	△	100	110	32	50	4	7	A	1.536
	▲	△	125	135	40	63	4	8	B	2.931
	▲	△	160	170	40	63	4	10	C	3.838
Close pitch	▲	△	50	60	22	40	4	5	A	0.298
	▲	△	63	73	22	40	4	6	A	0.425
	▲	△	80	90	27	50	4	7	A	1.025
	▲	△	100	110	32	50	4	9	A	1.521
	▲	△	125	135	40	63	4	10	B	2.919
	▲	△	160	170	40	63	4	12	C	3.825

▲Stock available

△Make-to-order

Spare parts

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

Tools code key
B24-B25

Grade selection guide
B19-B23

Technical data
B234-B240

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

Workpiece material	Good working condition					Normal working condition					Bad working condition				
	P	M	K	N	S	P	M	K	N	S	P	M	K	N	S
Steel	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊
Stainless steel	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊
Cast iron											😞	😞	😞		
Non-ferrous metal														😊	😊
Heat resistant alloy, Ti alloy						😊	😊	😊	😊		😞	😞			

[illegible]

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

Indexable milling tools

Face milling tools

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



► Recommended cutting parameters

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

Indexable
milling tools

Face milling tools

HURRICANE

FMA07

milling cutter series

**New generation of high economy
milling cutters**

**16 cutting edges
high economy**

8×2=16 edges



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



B MILLING

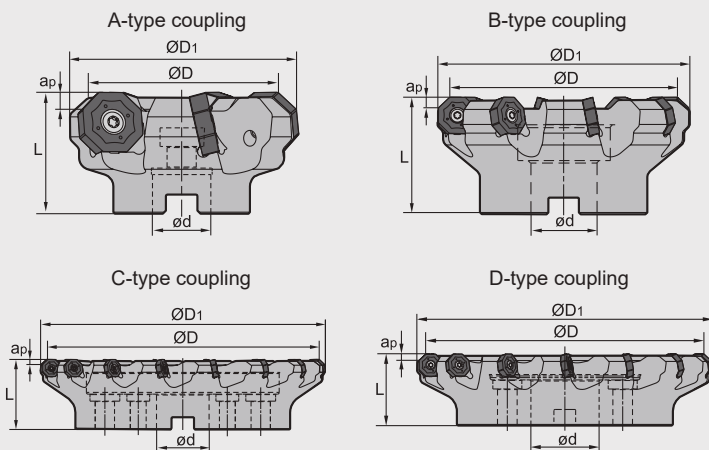
Indexable Milling Tools

Face milling tools

Kr:45°



FMA07 **P** **M** **K**



Specification of tools

Type	Stock		Basic dimensions(mm)					Number of teeth Z	Style of coupling	Weight (kg)
	R	L	ØD	ØD ₁	ød	L	apmax			
FMA07 -050-A22-ON06-05	▲	△	50	62	22	40	4	5	A	0.3
-063-A22-ON06-06	▲	△	63	75	22	40	4	6	A	0.5
-080-B27-ON06-07	▲	△	80	92	27	50	4	7	B	1.0
-100-B32-ON06-08	▲	△	100	112	32	63	4	8	B	1.9
-125-B40-ON06-09	▲	△	125	137	40	63	4	9	B	3.5
-160-C40-ON06-11	▲	△	160	172	40	63	4	11	C	4.3
-200-C60-ON06-13	▲	△	200	212	60	63	4	13	C	6.4
-250-C60-ON06-15	▲	△	250	262	60	63	4	15	C	13.4
-315-D60-ON06-17	▲	△	315	327	60	80	4	17	D	21.9
-063-A22-ON08-05	▲	△	63	78	22	40	5	5	A	0.5
-080-B27-ON08-06	▲	△	80	95	27	50	5	6	B	0.9
-100-B32-ON08-07	▲	△	100	115	32	63	5	7	B	1.8
-125-B40-ON08-08	▲	△	125	140	40	63	5	8	B	3.1
-160-C40-ON08-10	▲	△	160	175	40	63	5	10	C	4.1
-200-C60-ON08-12	▲	△	200	215	60	63	5	12	C	6.1
-250-C60-ON08-14	▲	△	250	265	60	63	5	14	C	12.0
-315-D60-ON08-16	▲	△	315	330	60	80	5	16	D	21.0

▲ Stock available

△ Make-to-order

Spare parts

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

Tools code key

B24-B25

Grade selection guide

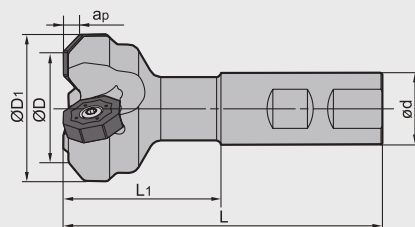
B19-B23

Technical data

B234-B240

Face milling tools

Kr:45°

**FMA07** **P** **M** **K**

Specification of tools

Type	Stock		Basic dimensions(mm)						Number of teeth Z	Weight (kg)
	R	L	ØD	ØD ₁	ød	L	L ₁	a _p max		
FMA07 -025-XP20-ON06-02	▲	△	25	37	20	95	45	4	2	0.2
-040-XP25-ON06-03	▲	△	40	52	25	106	50	4	3	0.4
-032-XP25-ON08-02	▲	△	32	47	25	111	55	5	2	0.4
-040-XP25-ON08-03	▲	△	40	55	25	111	55	5	3	0.5
-050-XP25-ON08-04	▲	△	50	65	25	111	55	5	4	0.6

▲ Stock available

△ Make-to-order

Indexable
milling tools

Face milling tools

Spare parts

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

Tools code key
B24-B25Grade selection guide
B19-B23Technical data
B234-B240



MILLING

Indexable Milling Tools

Case for FMA07



Tool type: FMA07-100-B32-ON08-07

Insert type/grade: ONHU08T508-PM/YBD152

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

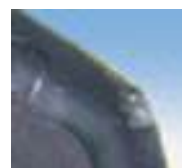


● Comparison of insert abrasion

Abrasion on rake face



ZCC-CT



similar product of company A

Abrasion on clearance face



ZCC-CT



similar product of company A

Selection of inserts

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
	😊😊😊				

Indexable milling tools

Face milling tools

Recommended cutting parameters

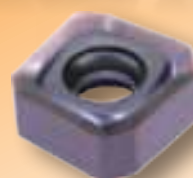
Workpiece material	Hardness HB	Insert grade	Cutting parameters		
			V _c (m/min)	f _z (mm/z)	a _p max(mm)
P	Low-carbon steel, Soft steel	YBG102 YBM253 YBG202 YBC302 YBG205 YB9320	270 (220-350)	0.2 (0.1-0.4)	4.0 (ONHU06) 5.0 (ONHU08)
	High-carbon steel, Alloy steel	YBG102 YBM253 YBG202 YBC302 YBG205 YB9320	260 (200-320)	0.2 (0.1-0.4)	
	Alloy tool steel	YBG102 YBM253 YBG202 YBC302 YBG205 YB9320	240 (180-300)	0.2 (0.1-0.4)	
M	Stainless steel	YBM253 YBG205 YB9320	230(180-300)	0.2(0.1-0.3)	
K	Cast iron	YBD152	270 (150-300)	0.4 (0.1-0.5)	

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

FMA11 Kr:45° Series

With outstanding economy and high performance

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



4 × 2=8 edge

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

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

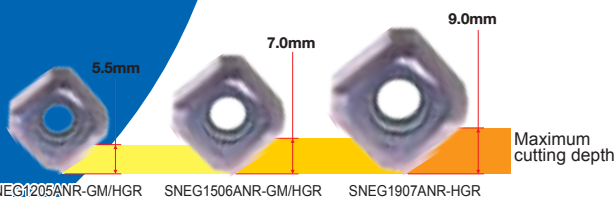
Insert with wiper, smoother surface roughness.

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



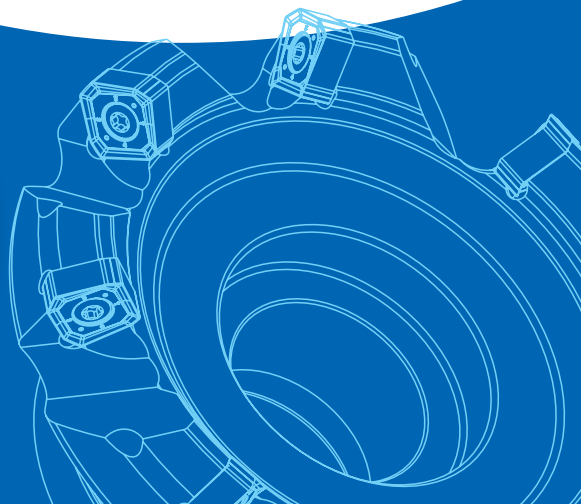
Double negative structure, excellent impact resistance.

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



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

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

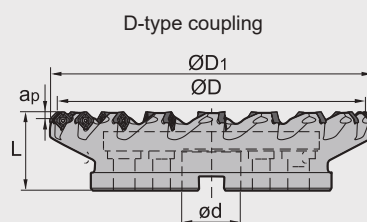
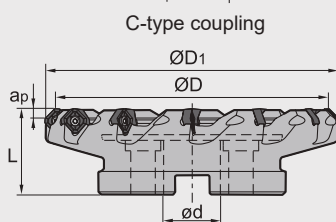
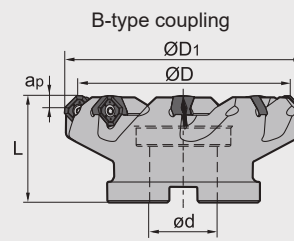
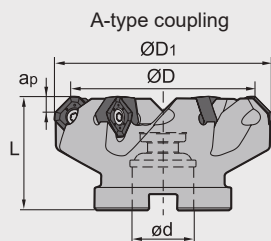


Face milling tools

Kr:45°



FMA11 P K M S



Specification of tools

Type	Stock	Basic dimensions(mm)						Number of teeth Z	Style of coupling	Weight (kg)
		R	ØD	ØD ₁	ød	L	apmax			
FMA11 Coarse pitch	-063-A22-SN12-05C	▲	63	75.2	22	40	5.5	5	A	0.55
	-080-A27-SN12-06C	▲	80	92.2	27	50	5.5	6	A	1.14
	-100-B32-SN12-07	▲	100	112.2	32	50	5.5	7	B	1.42
	-125-B40-SN12-08	▲	125	137.2	40	63	5.5	8	B	2.86
	-160-C40-SN12-10	▲	160	172.2	40	63	5.5	10	C	4.06
	-063-A22-SN15-05C	▲	63	78.4	22	40	7.0	5	A	0.56
	-080-A27-SN15-06C	▲	80	95.4	27	50	7.0	6	A	1.06
	-100-B32-SN15-07	▲	100	115.4	32	50	7.0	7	B	1.47
	-125-B40-SN15-08	▲	125	140.4	40	63	7.0	8	B	2.70
	-160-C40-SN15-10	▲	160	175.4	40	63	7.0	10	C	3.92
	-200-C60-SN15-12	▲	200	215.4	60	63	7.0	12	C	5.46
	-250-C60-SN15-14	▲	250	265.4	60	63	7.0	14	C	11.26
	-315-D60-SN15-18	▲	315	330.4	60	80	7.0	18	D	20.00
	-125-B40-SN19-07	▲	125	144.4	40	63	9.0	7	B	3.00
	-160-C40-SN19-09	▲	160	179.4	40	63	9.0	9	C	4.25
	-200-C60-SN19-11	▲	200	219.4	60	63	9.0	11	C	6.18
	-250-C60-SN19-13	▲	250	269.4	60	63	9.0	13	C	11.55
	-315-D60-SN19-16	▲	315	334.4	60	80	9.0	16	D	20.90

▲ Stock available

△ Make-to-order

Spare parts

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

Tools code key
B24-B25Grade selection guide
B19-B23Technical data
B234-B240Indexable
milling tools

Face milling tools



B MILLING

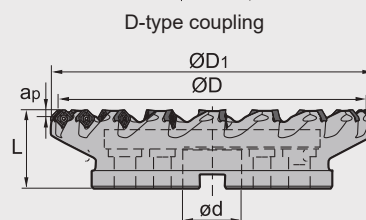
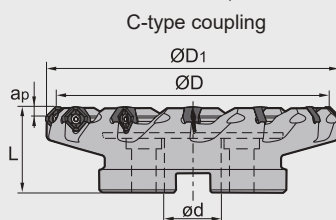
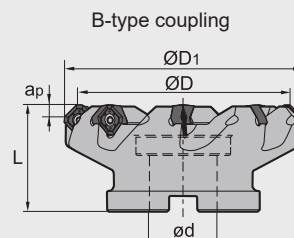
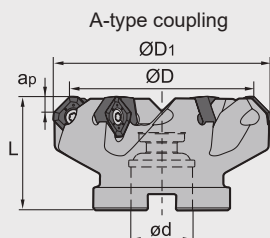
Indexable Milling Tools

Face milling tools

Kr:45°



FMA11 **P** **K** **M** **S**



Specification of tools

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

▲Stock available

△Make-to-order

Spare parts

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

Tools code key

B24-B25

Grade selection guide

B19-B23

Technical data

B234-B240

Selection of inserts

Selection of Inserts

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

Workpiece material	Steel	Stainless steel	Cast iron	Non-ferrous metal	Heat resistant alloy, Ti alloy
P	😊😊				

Indexable milling tools

Face milling tools

Recommended cutting parameters

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

Case for FMA11

Workpiece material: NAK80

Operation: Face milling

Tool: FMA11-125-B40-SN12-08

Insert: SNEG1205ANR-HGR/YBG205

Cutting parameters: V_c=200m/min, f_z=0.2mm/z,A_p=2mm, A_e=50mm

Tool Life Comparison

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

FMA 12 Series **Kr:45°**

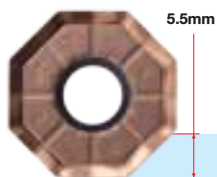
High Performance Face Mill with 16 edges for outstanding economy



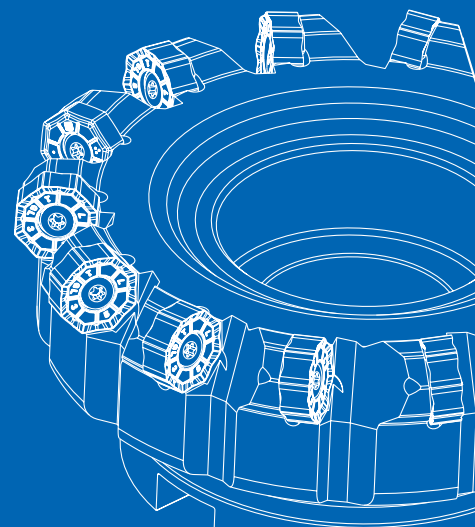
Double negative rake angle, in combination with helical insert structure, achieves double positive axial angle, which will help reduce cutting resistance and improve chip evacuation.



8 × 2 = 16 edges



ONHU09T508ANN-GM



Face milling tools

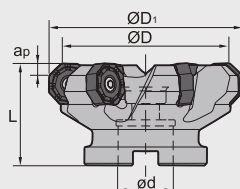
Kr:45°



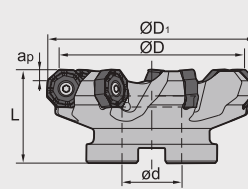
FMA12 P M K S



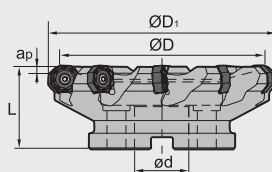
A-type coupling



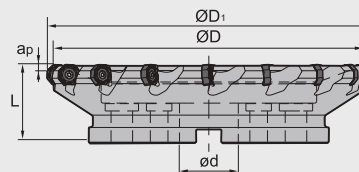
B-type coupling



C-type coupling



D-type coupling



Specification of tools

Type	Stock	Basic dimensions(mm)					Number of teeth Z	Style of coupling	Weight (kg)
		ØD	ØD ₁	ød	L	ap _{max}			
FMA12 Coarse pitch	-050-A22-ON06-04C	△	50	59	22	40	4	A	0.309
	-063-A27-ON06-05C	△	63	72	27	50	4	A	0.645
	-080-A27-ON06-07C	△	80	90	27	50	4	A	1.071
	-100-A32-ON06-08C	△	100	110	32	50	4	A	1.599
	-125-B40-ON06-10	△	125	135	40	63	4	B	3.114
	-160-C40-ON06-12	△	160	170	40	63	4	C	4.504
	-200-C60-ON06-18	▲	200	210	60	63	4	C	6.35
	-250-C60-ON06-20	▲	250	260	60	63	4	C	12.47
	-315-D60-ON06-22	▲	315	325	60	80	4	D	21.25
	-400-D60-ON06-28	▲	400	410	60	80	4	D	39.78
	-063-A22-ON09-04C	▲	63	76	22	50	5.5	A	0.7
	-080-A27-ON09-05C	▲	80	93	27	50	5.5	A	1.1
	-100-A32-ON09-06C	▲	100	113	32	50	5.5	A	1.6
	-125-B40-ON09-08	△	125	138	40	63	5.5	B	3.1
	-160-C40-ON09-10	△	160	173	40	63	5.5	C	3.982
	-200-C60-ON09-12	△	200	303	60	63	5.5	C	4.987
	-250-C60-ON09-16	△	250	260	60	63	5.5	C	11.89
	-315-D60-ON09-20	△	315	325	60	80	5.5	D	20.97
	-400-D60-ON09-24	△	400	410	60	80	5.5	D	38.69

▲Stock available

△Make-to-order

Indexable
milling tools

Face milling tools



B MILLING

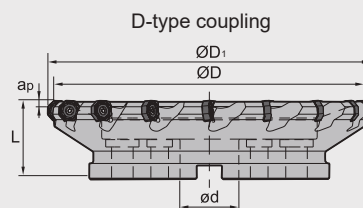
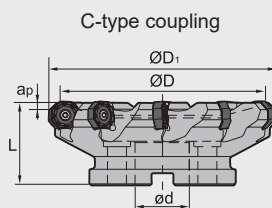
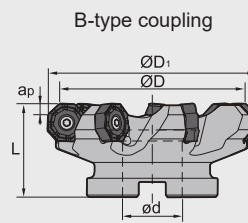
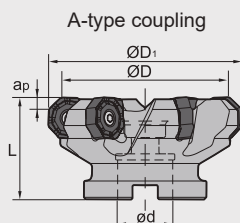
Indexable Milling Tools

Face milling tools

Kr:45°



FMA12 P M K S



Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Style of coupling	Weight (kg)
			ØD	ØD ₁	ød	L	a _p max			
FMA12 Coarse pitch	-050-A22-ON06-05C	△	50	59	22	40	4	5	A	0.352
	-063-A27-ON06-07C	△	63	72	27	50	4	7	A	0.695
	-080-A27-ON06-09C	△	80	90	27	50	4	9	A	1.098
	-100-A32-ON06-11C	△	100	110	32	50	4	11	A	1.616
	-125-B40-ON06-14	△	125	135	40	63	4	14	B	3.151
	-160-C40-ON06-18	△	160	170	40	63	4	18	C	4.568
	-063-A22-ON09-06C	▲	63	76	22	50	5.5	6	A	0.84
	-080-A27-ON09-07C	▲	80	93	27	50	5.5	7	A	1.24
	-100-A32-ON09-10C	▲	100	113	32	50	5.5	10	A	1.809
	-125-B40-ON09-12C	▲	125	138	40	63	5.5	12	B	3.648
	-160-C40-ON09-15	▲	160	173	40	63	5.5	15	C	4.303
	-200-C60-ON09-18	▲	200	303	60	63	5.5	18	C	5.754
	-125-B40-ON06-14W2	▲	125	138	40	63	4	12+2	B	3.626
	-160-B40-ON06-18W3	△	160	173	40	63	4	15+3	B	4.787
	-200-C60-ON06-24W4	△	200	303	60	63	4	20+4	C	6.231

▲Stock available △Make-to-order

Spare parts

Diameter ØD	Inserts	Insert screw		Wrench	
Ø50-Ø63	ONMU06□□□□-GM/GH	IRM4X10	I60M5X13	WT15IP	
Ø80-Ø125	ONHU06□□□□ANN-GM/GH/GL			WT15IS	
Ø160				WT15IT	
Ø63-Ø125	ONMU09□□□□-GM/GH	DM6X20A	ADJ-M6X1.0A	WT20IS	
Ø160-Ø400	ONHU09□□□□ANN-GM/GH/GL			WT20IT	
Diameter ØD	Inserts	Insert screw	Adjustment block	Insert screw	Wrench
Ø125	ONMU06□□□□-GM/GH				
Ø160-Ø200	ONHU06□□□□ANN-GM/GH/GL				
	ONHU0604AN-W				

Tools code key
B24-B25

Grade selection guide
B19-B23

Technical data
B234-B240

Selection of inserts

		😊 Good working condition					😐 Normal working condition					😞 Bad working condition				
Workpiece material	P	Steel	😊	😊	😊	😊	😊					😊	😊	😊	😊	😊
	M	Stainless steel	😊	😊	😊	😊	😊					😊	😊	😊	😊	😊
	K	Cast iron						😊	😊	😊	😊					
	N	Non-ferrous metal														
	S	Heat resistant alloy, Ti alloy						😊	😊	😊	😊				😊	😊

Insert shape	Type	Basic dimensions(mm)						CVD Coating					PVD Coating					Cermet	Cemented carbide											
		L	ØI.C	S	ød	r	bs	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG105	YBG202	YBG205	YBG320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	ONHU060404ANN-GL	6.15	15.875	5.54	6	0.4	1.2				●	●						●	●					●						
	ONHU09T508ANN-GL	8.0	20.2	5.8	7	0.8	1.2				●	●						●	●					●						
	ONHU060408ANN-GM	6.15	15.875	5.54	6	0.8	1				●	●						●	●					●						
	ONMU060408-GM	6.15	15.875	5.54	6	0.8	-				●	●						●	●											
	ONHU09T508ANN-GM	8.0	20.2	5.8	7	0.8	1.2				●	●						●	●					●						
	ONMU09T512-GM	8.0	20.2	5.8	7	1.2	-				●	●						●	●											
	ONMU060408-GH	6.15	15.875	5.54	6	0.8	-				●	●						●	●					●						
	ONHU060408ANN-GH	6.15	15.875	5.54	6	0.8	1				●	●						●	●					●						
	ONHU09T508ANN-GH	8.0	20.2	5.8	7	0.8	1.2				●	●						●	●					●						
	ONMU09T512-GH	8.0	20.2	5.8	7	1.2	-				●	●						●	●											
	ONHU0604AN-W	6.15	15.875	4.97	6	0.8	-									●														

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

Indexable milling tools

Face milling tools

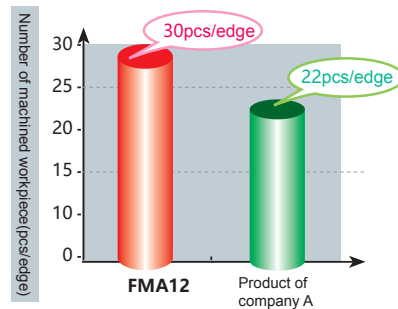
Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade		Cutting parameters		
					V _c (m/min)	f _z (mm/z)	a _{pmax} (mm)
P	Low carbon steel	≤ 180	YBM253 YB9320	YBG205	270(220-350)	0.2(0.1-0.3)	4.0(ON06) 5.5(ON09)
	Alloy steel	180-350	YBM253 YB9320	YBG205	240(180-320)	0.15(0.1-0.3)	
M	Stainless steel	≤ 270	YBM253 YB9320	YBG205	230 (180-300) 160 (110-270)	0.15 (0.1-0.3)	
K	Cast iron	180-260	YBD152		270(150-300)	0.2(0.1-0.3)	
S	Hard-to-cut material	≤ 400	YBS303		100(60-120)	0.15 (0.08-0.3)	

Case for FMA12



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



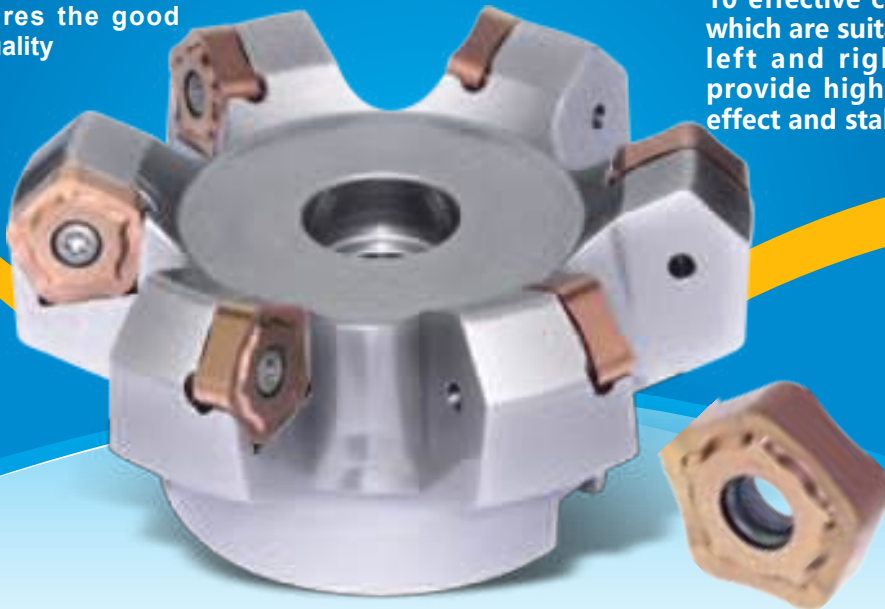
Tool Life comparison

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

FMA 14

The general milling cutter with high-effective multiple cutting edges

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



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

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

The abundant chipbreaker series could deal with different machining condition

-GL: Emphasis on stable machining

Suitable for low cutting forces and the insufficient machine load situation

-GM: First choice for P material machining

The large radius cutting edge with optimized cutting edge design

-GH: Emphasis on anti-breakage machining

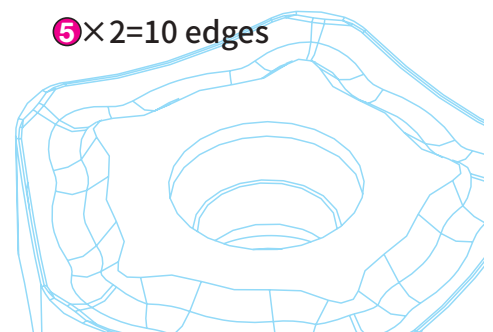
The high strength of the cutting edge significantly control the breakage risks

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

-GL/-GM/-GH



5×2=10 edges

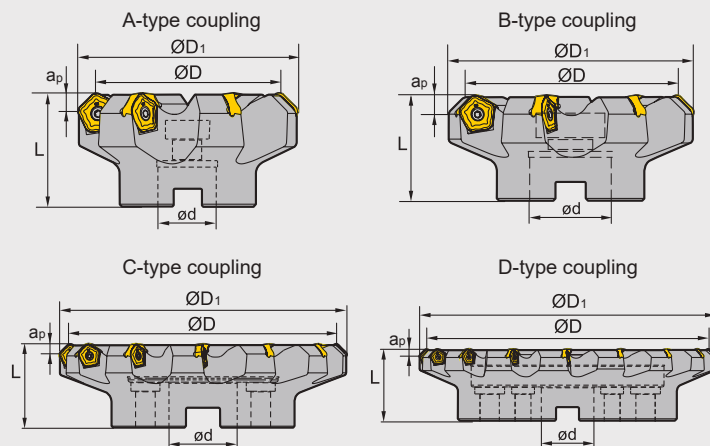


Face milling tools

Kr:45°



FMA14 P M K



Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Style of coupling	Weight (kg)
			ØD	ØD ₁	L	ød	a _p max			
FMA14 Coarse pitch	-050-A22-PN11-04	▲	50	66.7	50	22	5.5	4	A	0.571
	-063-A22-PN11-05	▲	63	79.7	50	22	5.5	5	A	0.77
	-080-A27-PN11-06	▲	80	96.7	50	27	5.5	6	A	1.09
	-100-B32-PN11-07	▲	100	116.7	50	32	5.5	7	B	1.48
	-125-B40-PN11-08	▲	125	141.7	63	40	5.5	8	B	3.39
	-160-B40-PN11-10	▲	160	176.7	63	40	5.5	10	B	5.93
	-200-C60-PN11-12	▲	200	216.7	63	60	5.5	12	C	6.28
	-250-C60-PN11-14	▲	250	266.7	63	60	5.5	14	C	11.84
	-315-D60-PN11-16	▲	315	331.7	80	60	5.5	16	D	19.8
Close pitch	-050-A22-PN11-05	▲	50	66.7	50	22	5.5	5	A	0.6
	-063-A22-PN11-06	▲	63	79.7	50	22	5.5	6	A	0.9
	-080-A27-PN11-08	▲	80	96.7	50	27	5.5	8	A	1.2
	-100-B32-PN11-10	▲	100	116.7	50	32	5.5	10	B	1.9
	-125-B40-PN11-12	▲	125	141.7	63	40	5.5	12	B	3.5
	-160-B40-PN11-14	▲	160	176.7	63	40	5.5	14	B	6.4
	-200-C60-PN11-16	▲	200	216.7	63	60	5.5	16	C	8.5
	-250-C60-PN11-18	▲	250	266.7	63	60	5.5	18	C	18.0
	-315-D60-PN11-26	▲	315	331.7	80	60	5.5	26	D	24.5

▲ Stock available

△ Make-to-order

Spare parts

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

Tools code key
B24-B25Grade selection guide
B19-B23Technical data
B234-B240Indexable
milling tools

Face milling tools

Indexable Milling Tools

[illegible]

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

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

Cooling system: Dry cutting

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

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

Face milling tools

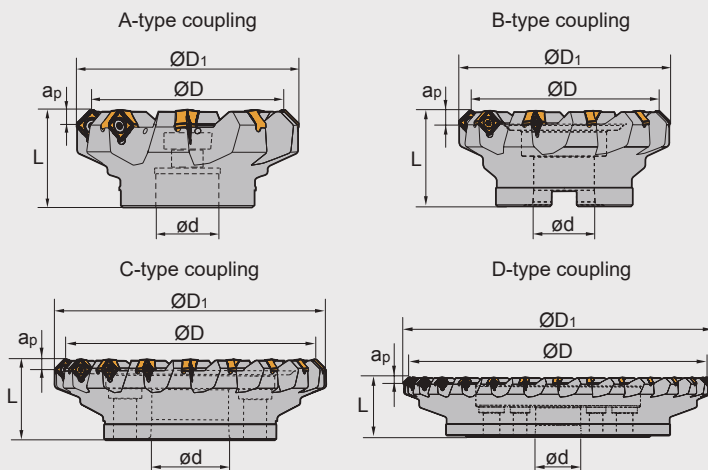
Kr:45°



FMA17 P M K S



Specification of tools



Type		Stock	Basic dimensions(mm)					Number of teeth Z	Style of coupling	Weight (kg)
			ØD	ØD ₁	ød	L	a _{pmax}			
FMA17 Coarse pitch	-050-A22-SN12-04C	▲	50	65	22	40	6.5	4	A	0.384
	-063-A22-SN12-06C	▲	63	78	22	40	6.5	6	A	0.717
	-080-A27-SN12-07C	▲	80	95	27	50	6.5	7	A	1.085
	-100-A32-SN12-08	▲	100	115	32	50	6.5	8	A	1.558
	-125-B40-SN12-10	▲	125	140	40	63	6.5	10	B	3.012
	-160-C40-SN12-12	▲	160	175	40	63	6.5	12	C	4.358
	-200-C60-SN12-18	▲	200	215	60	63	6.5	18	C	6.337
	-250-C60-SN12-20	▲	250	265	60	63	6.5	20	C	12.360
	-315-D60-SN12-22	▲	315	330	60	80	6.5	22	D	21.224
	-400-D60-SN12-28	▲	400	415	60	80	6.5	28	D	39.535
Close pitch	-050-A22-SN12-06C	▲	50	65	22	40	6.5	6	A	0.381
	-063-A22-SN12-08C	▲	63	78	22	40	6.5	8	A	0.717
	-080-A27-SN12-10C	▲	80	95	27	50	6.5	10	A	1.105
	-100-A32-SN12-12C	▲	100	115	32	50	6.5	12	A	1.656
	-125-B40-SN12-16	▲	125	140	40	63	6.5	16	B	3.103
	-160-C40-SN12-20	▲	160	175	40	63	6.5	20	C	4.600
	-200-C60-SN12-24	▲	200	215	60	63	6.5	24	C	6.569

▲ Stock available

△ Make-to-order

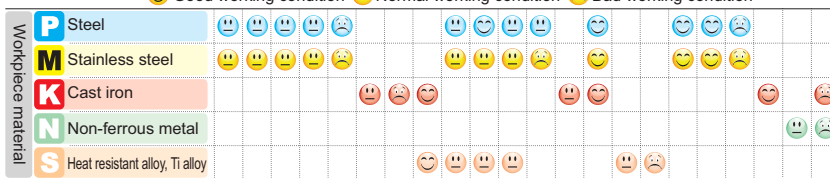
Spare parts

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

Tools code key
B24-B25Grade selection guide
B19-B23Technical data
B234-B240Indexable
milling tools

Face milling tools

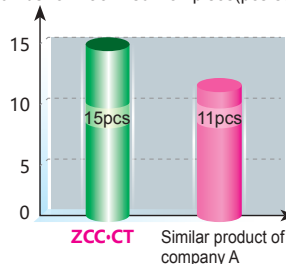
😊 Good working condition 😐 Normal working condition ☹ Bad working condition



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

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

Number of machined workpiece(pcs/edge)



WHIRLWIND

FMD02

milling cutter series

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

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

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

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

High strength screw clamping

67° approach angle

Wiper

Each insert has 10 cutting edges

New

New chipbreaker for cast iron

-KH -KM -KL

-KH

The optimized cutting edge design emphasis on anti-breakage machining

-KM

general machining chipbreaker. The first choice for cast iron machining

-KL

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

General face milling for steel and cast iron.

-GF -GM -GR

5×2=10 edges

General face milling for cast iron

-PF -PM -PR

5×2=10 edges

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

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

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

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



Face milling tools

Kr:67°

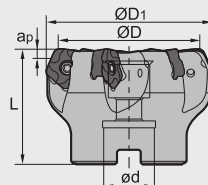


Face milling

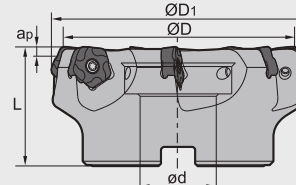
FMD02 P K



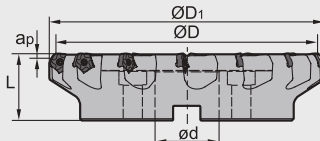
A-type coupling



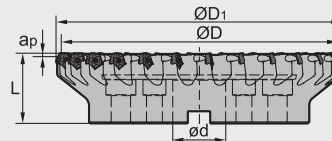
B-type coupling



C-type coupling



D-type coupling



Specification of tools

Type		Stock		Basic dimensions(mm)					Number of teeth Z	Style of coupling	Weight (kg)
		R	L	ØD	ØD ₁	ød	L	a _{pmax}			
FMD02 Coarse pitch (unequal pitch)	-050-A22-PN11-04	▲	△	50	60.1	22	50	5/6.5/7.5	4	A	0.6
	-063-A22-PN11-05	▲	△	63	73.1	22	50	5/6.5/7.5	5	A	0.8
	-080-A27-PN11-06	▲	△	80	90.1	27	50	5/6.5/7.5	6	A	1.1
	-100-B32-PN11-07	▲	△	100	110.1	32	50	5/6.5/7.5	7	B	1.8
	-125-B40-PN11-08	▲	△	125	135.1	40	63	5/6.5/7.5	8	B	2.9
	-160-B40-PN11-10	▲	△	160	170.1	40	63	5/6.5/7.5	10	B	5.6
	-200-C60-PN11-12	▲	△	200	210.1	60	63	5/6.5/7.5	12	C	7.9
	-250-C60-PN11-14	▲	△	250	260.1	60	63	5/6.5/7.5	14	C	13.4
Close pitch	-050-A22-PN11-05	▲	△	50	60.1	22	50	5/6.5/7.5	5	A	0.6
	-063-A22-PN11-06	▲	△	63	73.1	22	50	5/6.5/7.5	6	A	0.9
	-080-A27-PN11-08	▲	△	80	90.1	27	50	5/6.5/7.5	8	A	1.2
	-100-B32-PN11-10	▲	△	100	110.1	32	50	5/6.5/7.5	10	B	1.9
	-125-B40-PN11-12	▲	△	125	135.1	40	63	5/6.5/7.5	12	B	3.2
	-160-B40-PN11-14	▲	△	160	170.1	40	63	5/6.5/7.5	14	B	6.4
	-200-C60-PN11-16	▲	△	200	210.1	60	63	5/6.5/7.5	16	C	8.5
	-250-C60-PN11-18	▲	△	250	260.1	60	63	5/6.5/7.5	18	C	18.0
	-315-D60-PN11-26	▲	△	315	325.1	60	80	5/6.5/7.5	26	D	24.5

▲Stock available

△Make-to-order

Spare parts

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

Tools code key

B24-B25

Grade selection guide

B19-B23

Technical data

B234-B240

Face milling tools

Kr:67°

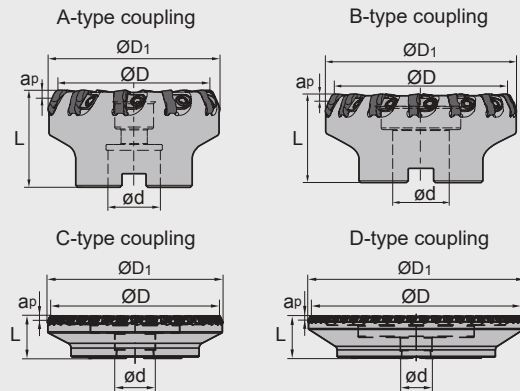


Face milling

FMD02 P K



Specification of tools



Type		Stock		Basic dimensions(mm)					Number of teeth Z	Style of coupling	Weight (kg)
		R	L	ØD	ØD ₁	ød	L	apmax			
FMD02 Extra close pitch	-080-A27-PN11-10	▲	△	80	90.1	27	50	5/6.5/7.5	10	A	1.3
	-100-B32-PN11-14	▲	△	100	110.1	32	50	5/6.5/7.5	14	B	1.6
	-125-B40-PN11-18	▲	△	125	135.1	40	63	5/6.5/7.5	18	B	3.2
	-160-B40-PN11-22	▲	△	160	170.1	40	63	5/6.5/7.5	22	B	5.8
	-200-C60-PN11-28	▲	△	200	210.1	60	63	5/6.5/7.5	28	C	9.7
	-250-C60-PN11-36	▲	△	250	260.1	60	63	5/6.5/7.5	36	C	19.8
	-315-D60-PN11-44	▲	△	315	325.1	60	80	5/6.5/7.5	44	D	32.5

▲ Stock available

△ Make-to-order

Indexable milling tools

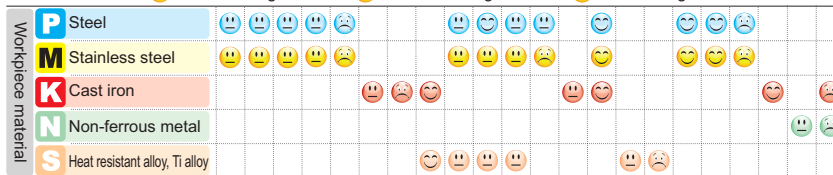
Face milling tools

Spare parts

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

Tools code key
B24-B25Grade selection guide
B19-B23Technical data
B234-B240

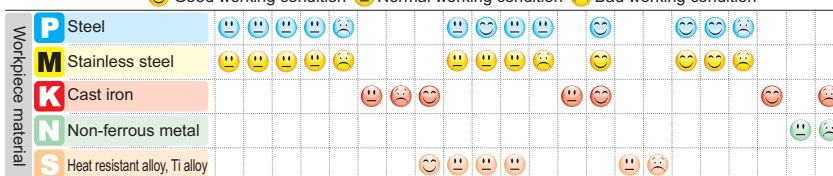
😊 Good working condition 😐 Normal working condition ☹ Bad working condition

[illegible]

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

Face milling tools

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

[illegible]

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

[illegible][illegible]

☐ Make-to-order

Face milling tools

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

Case for FMD02

Application case

ZCC·CT

Cutting parameters:
 $D=100\text{mm}$, $a_p=3\sim 5\text{mm}$,
 $V_c=243\text{m/min}$, $f_z=0.15\text{mm/z}$,
 $T=145\sim 155$ piece

similar product of company A

Cutting parameters:
 $D=100\text{mm}$, $a_p=3\sim 5\text{mm}$,
 $V_c=243\text{m/min}$, $f_z=0.12\text{mm/z}$,
 $T=120\sim 133$ piece



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

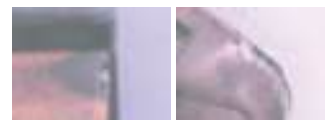
Insert type/grade: PNEG110512R-CR/YBD152

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

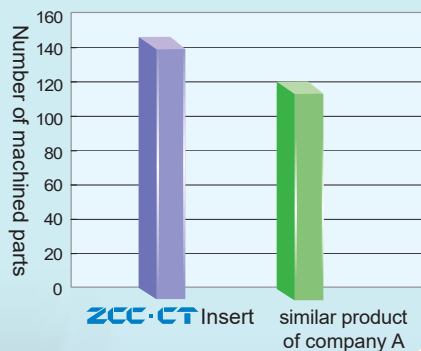
● Comparison of insert abrasion



ZCC·CT insert after 80 minutes machining

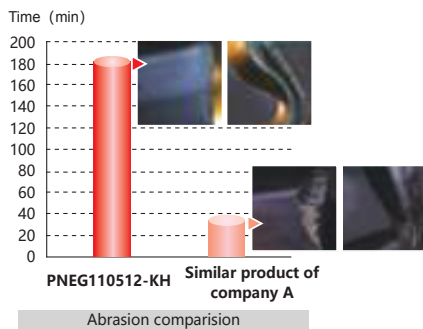


Insert of company A after 48 minutes machining

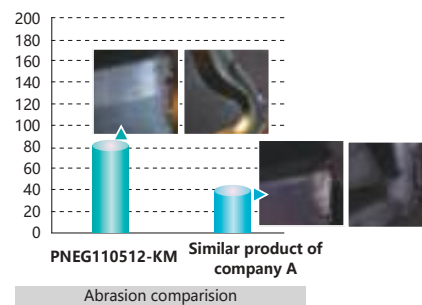


Application case

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



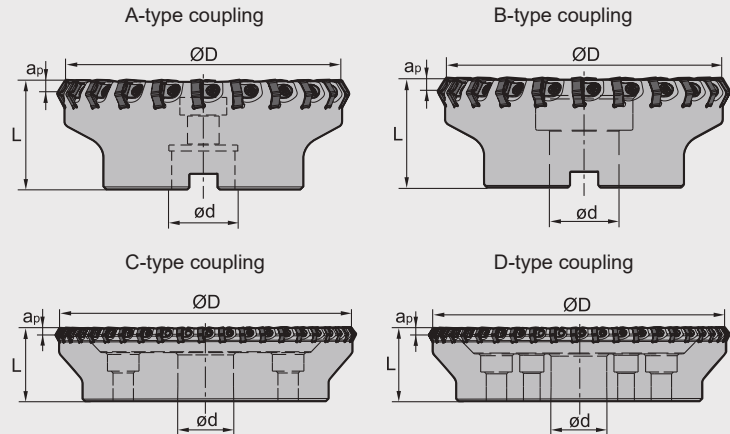
Cutting parameters: $V_c=240\text{m/min}$,
 $f_z=0.3\text{mm/z}$, $A_p=3\text{mm}$, $A_e=70\text{mm}$



Cutting parameters: $V_c=300\text{m/min}$,
 $f_z=0.2\text{mm/z}$, $A_p=2\text{mm}$, $A_e=70\text{mm}$

Face milling tools

Kr:55°

FMD02 

Specification of tools

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

▲Stock available

△Make-to-order

Indexable milling tools

Face milling tools

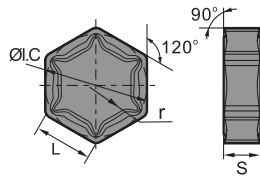
Spare parts

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

Tools code key
B24-B25Grade selection guide
B19-B23Technical data
B234-B240

B MILLING Indexable Milling Tools

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

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

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

Chipbreaker selection for FMD02 milling inserts

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

Recommended cutting parameters

Workpiece material	Hardness HB	Insert grade	Cutting parameters			
			V _c (m/min)	f _z (mm/z)		
				-DF	-DM	-DR
K	Cast iron	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

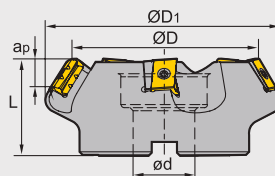
Kr:60°



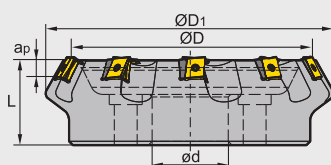
FMD03 P M K



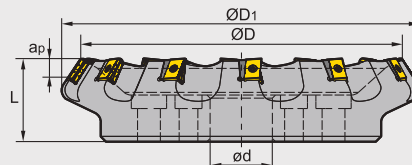
B-type coupling



C-type coupling



D-type coupling



Specification of tools

Type	Stock		Basic dimensions(mm)					Number of teeth Z	Style of coupling	Weight (kg)
	R	L	ØD	ØD ₁	ød	L	ap _{max}			
FMD03 -125-B40-LN20-06	▲	△	125	153	40	63	12	6	B	4.5
-160-C40-LN20-08	▲	△	160	187	40	63	12	8	C	6.9
-200-C60-LN20-10	▲	△	200	227	60	70	12	10	C	10.5
-250-C60-LN20-12	▲	△	250	276	60	70	12	12	C	13.4
-315-D60-LN20-15	▲	△	315	339	60	80	12	15	D	26.2
-125-B40-LN25-05	▲	△	125	154	40	63	17	5	B	4.5
-160-C40-LN25-06	▲	△	160	189	40	63	17	6	C	6.9
-200-C60-LN25-08	▲	△	200	229	60	70	17	8	C	10.5
-250-C60-LN25-10	▲	△	250	278	60	70	17	10	C	16.7
-315-D60-LN25-12	▲	△	315	346	60	80	17	12	D	27.3
-400-D60-LN25-16	▲	△	400	427	60	80	17	16	D	47.1

▲ Stock available

△ Make-to-order

Indexable milling tools

Face milling tools

Spare parts

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

Tools code key
B24-B25Grade selection guide
B19-B23Technical data
B234-B240

Indexable Milling Tools

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

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

Face milling tools

Kr:75°

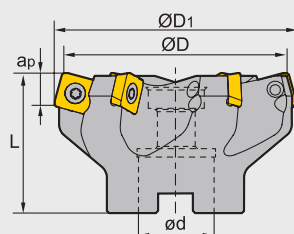


Face milling

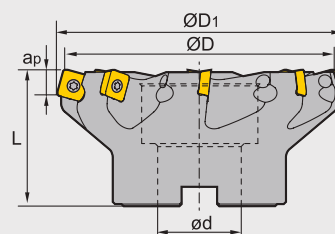
FME02 P M K



A-type coupling



B-type coupling



Specification of tools

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

▲Stock available

△Make-to-order

Indexable
milling tools

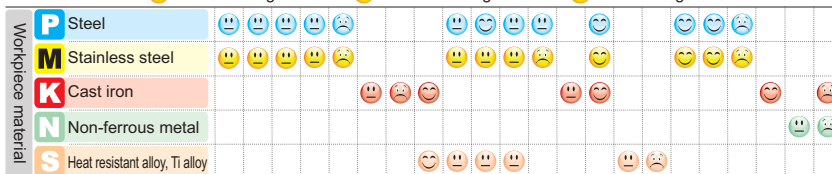
Face milling tools

Spare parts

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

Tools code key
B24-B25Grade selection guide
B19-B23Technical data
B234-B240

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

[illegible]

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

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

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

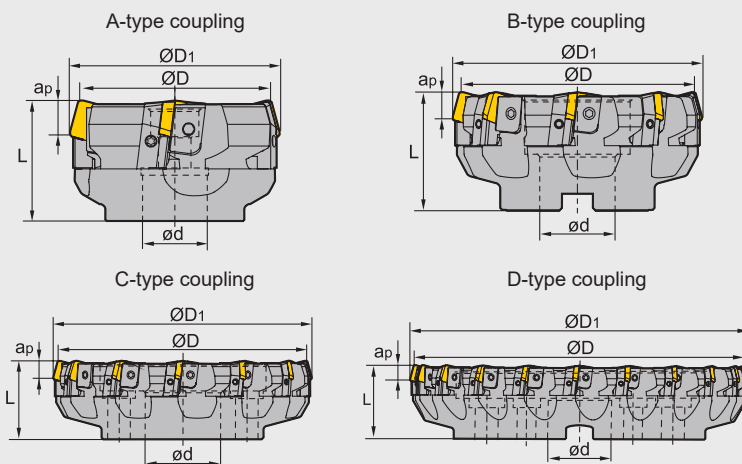
Face milling tools

Kr:75°



Face milling

FME03 P M K



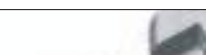
Specification of tools

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

△ Make-to-order

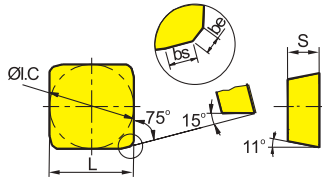
Spare parts

Diameter ØD	Inserts	Locator	Wedge	Wedge Screw	Locator screw	Wrench	
							
Ø80-Ø100	SP12	LSP12R/L	W04R/L	WM8×17	LOM5×15.1	WT20T WT25T	
Ø125-Ø315				WM8×22			
Ø80-Ø315	SP15	LSP15R/L	W04R/L	WM8×22			

Tools code key
B24-B25Grade selection guide
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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
YBC301	😊	😊	😊	😊	😊
YBC302	😊	😊	😊	😊	😊
YBM251	😊	😊	😊	😊	😊
YBM253	😊	😊	😊	😊	😊
YBM351	😊	😊	😊	😊	😊
YBD152	😊	😊	😊	😊	😊
YBD252	😊	😊	😊	😊	😊
YBG102	😊	😊	😊	😊	😊
YBG202	😊	😊	😊	😊	😊
YBG205	😊	😊	😊	😊	😊
YBG320	😊	😊	😊	😊	😊
YBG302	😊	😊	😊	😊	😊
YBG152	😊	😊	😊	😊	😊
YBG252	😊	😊	😊	😊	😊
YBS203	😊	😊	😊	😊	😊
YBS303	😊	😊	😊	😊	😊
YNG151	😊	😊	😊	😊	😊
YNG151C	😊	😊	😊	😊	😊
YC30S	😊	😊	😊	😊	😊
YD051	😊	😊	😊	😊	😊
YD101	😊	😊	😊	😊	😊
YD201	😊	😊	😊	😊	😊

Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating					Cermet	Cemented carbide										
		L	ØI.C	S	be	bs	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205		YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101
	SPKN1203EDER	12.7	12.7	3.18	1	1.4								○														
	SPKN1203EDEL	12.7	12.7	3.18	1	1.4								○														
	SPKN1203EDFR	12.7	12.7	3.18	1	1.4								★	○												●	
	SPKN1203EDFL	12.7	12.7	3.18	1	1.4								○	○												○	
	SPKN1203EDSKR	12.7	12.7	3.18	1	1.4												○							○			
	SPKN1203EDSKL	12.7	12.7	3.18	1	1.4												○							○			
	SPKN1203EDTKR	12.7	12.7	3.18	1	1.4	●				●			○		★									●		○	
	SPKN1203EDTKL	12.7	12.7	3.18	1	1.4								○		○									○		○	
	SPKN1203EDS31R	12.7	12.7	3.18	1	1.4												○							○			
	SPKN1203EDS31L	12.7	12.7	3.18	1	1.4												○							○			
	SPKN1203EDT31R	12.7	12.7	3.18	1	1.4	●				●			○		★									●		○	
	SPKN1203EDT31L	12.7	12.7	3.18	1	1.4								○		○									○		○	
	SPKR1203EDR-GM	12.7	12.7	3.18	1	1.4			●					★		★									●		●	
	SPKR1203EDL-GM	12.7	12.7	3.18	1	1.4			●					★		★									●		●	
	SPKN1504EDER	15.875	15.875	4.76	1	1.4								○														
	SPKN1504EDEL	15.875	15.875	4.76	1	1.4								○														
	SPKN1504EDFR	15.875	15.875	4.76	1	1.4								○	○												○	
	SPKN1504EDFL	15.875	15.875	4.76	1	1.4								○	○												○	
	SPKN1504EDSKR	15.875	15.875	4.76	1	1.4												○							○			
	SPKN1504EDSKL	15.875	15.875	4.76	1	1.4												○							○			
	SPKN1504EDTKR	15.875	15.875	4.76	1	1.4	●							★		○									●		●	
	SPKN1504EDTKL	15.875	15.875	4.76	1	1.4								○		○									○		●	
	SPKN1504EDS32R	15.875	15.875	4.76	1	1.4												○							○			
	SPKN1504EDS32L	15.875	15.875	4.76	1	1.4												○							○			
	SPKN1504EDT32R	15.875	15.875	4.76	1	1.4	●							★		○									●		●	
	SPKN1504EDT32L	15.875	15.875	4.76	1	1.4								○		○									○		●	
	SPKR1504EDR-GM	15.875	15.875	4.76	1	1.4			●					★		★									●		●	
	SPKR1504EDL-GM	15.875	15.875	4.76	1	1.4			●					★		★									●		●	

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

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

Selection of inserts

😊 Good working condition

😐 Normal working condition

😞 Bad working condition

Workpiece material	CVD Coating										PVD Coating				Cermet	Cemented carbide										
	P Steel	M Stainless steel	K Cast iron	N Non-ferrous metal	S Heat resistant alloy, Ti alloy	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101
Steel	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊
Stainless steel	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊
Cast iron	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊
Non-ferrous metal	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊
Heat resistant alloy, Ti alloy	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊

Insert shape	Type	Basic dimensions(mm)						CVD Coating						PVD Coating						Cermet	Cemented carbide							
		A	ØI.C	I.W	S	bs	R	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101
inserts with wiper	SPEX1203EDL-1	15	12.7	12.7	3.18	10	500																					●
	SPEX1203EDR-1	15	12.7	12.7	3.18	10	500																					●
	SPEX1504EDL-1	18.2	15.875	15.875	4.76	10	500																			○		●
	SPEX1504EDR-1	18.2	15.875	15.875	4.76	10	500																			○		●

★ Recommended grade (always stock available)

● Available grade (always stock available)

○ Make-to-order

Cutting edge treatment selection for FME03 milling inserts

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



MILLING

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► Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				V _c (m/min)	f _z (mm/z)
P	Low-carbon steel, Soft steel	≤ 180	YBG202	270 (200-360)	0.2 (0.1-0.4)
			YBG302	230 (170-350)	0.24 (0.1-0.3)
			YBM251 YBC301	270(220-350)	0.2 (0.1-0.4)
			YBM351	220 (180-300)	0.25 (0.15-0.3)
			YC30S	140 (100-220)	0.22 (0.1-0.3)
	High-carbon steel, Alloy steel	180-280	YBG202	240 (180-350)	0.2 (0.1-0.3)
			YBG302	220 (150-330)	0.24 (0.1-0.3)
			YBM251 YBC301	240 (200-320)	0.2 (0.1-0.4)
			YBM351	200 (160-280)	0.25 (0.15-0.3)
			YC30S	120 (80-200)	0.22 (0.1-0.3)
	Alloy tool steel	280-350	YBG202	220 (170-340)	0.2 (0.1-0.3)
			YBG302	190 (130-300)	0.24 (0.1-0.3)
			YBM251 YBC301	220 (180-300)	0.2 (0.1-0.4)
			YBM351	180 (150-250)	0.25 (0.15-0.3)
			YC30S	100 (60-180)	0.22 (0.1-0.3)
M	Stainless steel	≤ 270	YBG202	160 (110-270)	0.2 (0.1-0.3)
			YBG302	140 (100-250)	0.24 (0.1-0.3)
			YBM251	150 (120-240)	0.2 (0.1-0.4)
			YBM351	140 (100-240)	0.25 (0.15-0.3)
K	Cast iron	180-250	YBG102	210 (120-300)	0.12 (0.08-0.3)
			YBG302	160 (120-200)	0.2 (0.1-0.3)
			YD201	100 (80-160)	0.24 (0.15-0.4)

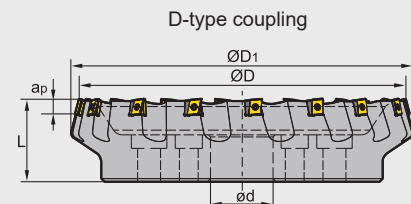
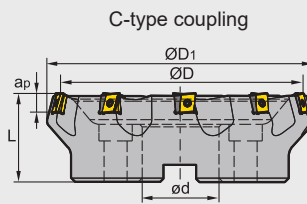
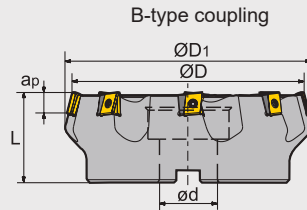
Indexable
milling tools

Face milling tools



Face milling tools

Kr:75°

**FME04** P M K

Specification of tools

Type	Stock		Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
	R	L	ØD	ØD ₁	ød	L	apmax			
FME04 -125-B40-LN15-06	▲	△	125	137	40	63	12	6	B	3.8
-160-B40-LN15-08	▲	△	160	170	40	63	12	8	B	6.6
-200-C60-LN15-10	▲	△	200	208	60	70	12	10	C	9.6
-250-C60-LN15-12	▲	△	250	257	60	70	12	12	C	13.4
-315-D60-LN15-16	▲	△	315	328	60	80	12	16	D	25.2

▲ Stock available

△ Make-to-order

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Face milling tools

Spare parts

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

Tools code key
B24-B25Grade selection guide
B19-B23Technical data
B234-B240

B MILLING Indexable Milling Tools

Selection of inserts

😊 Good working condition

😐 Normal working condition

😞 Bad working condition

Workpiece material	P Steel	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊	😊😊😊😊😊
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Recommended cutting parameters

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

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

Face milling tools

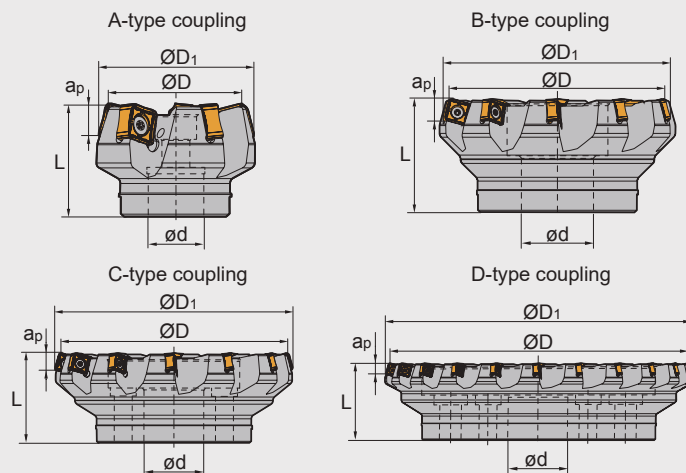
Kr:75°



FME17 P M K S



Specification of tools



Type		Stock	Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
			ØD	ØD ₁	ød	L	a _p max			
FME17 Coarse pitch	-050-A22-SN12-04C	▲	50	60	22	40	8.0	4	A	0.361
	-063-A22-SN12-05C	▲	63	73	22	40	8.0	5	A	0.520
	-080-A27-SN12-06C	▲	80	90	27	50	8.0	6	A	1.101
	-100-A32-SN12-08C	▲	100	110	32	50	8.0	8	A	1.663
	-125-B40-SN12-10	▲	125	135	40	63	8.0	10	B	3.099
	-160-C40-SN12-12	▲	160	170	40	63	8.0	12	C	4.535
	-200-C60-SN12-14	▲	200	210	60	63	8.0	14	C	6.450
	-250-C60-SN12-18	▲	250	260	60	63	8.0	18	C	12.980
	-315-D60-SN12-22	▲	315	325	60	80	8.0	22	D	21.932
-400-D60-SN12-28	▲	400	410	60	80	8.0	28	D	41.555	
Close pitch	-050-A22-SN12-05C	▲	50	60	22	40	8.0	5	A	0.337
	-063-A22-SN12-07C	▲	63	73	22	40	8.0	7	A	0.530
	-080-A27-SN12-09C	▲	80	90	27	50	8.0	9	A	1.112
	-100-A32-SN12-11C	▲	100	110	32	50	8.0	11	A	1.577
	-125-B40-SN12-14	▲	125	135	40	63	8.0	14	B	3.145
	-160-C40-SN12-18	▲	160	170	40	63	8.0	18	C	4.647
	-200-C60-SN12-22	▲	200	210	60	63	8.0	22	C	6.552

▲ Stock available

△ Make-to-order

Spare parts

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

Tools code key
B24-B25Grade selection guide
B19-B23Technical data
B234-B240

Indexable Milling Tools

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

Workpiece material	Good working condition			Normal working condition			Bad working condition		
	Good	Normal	Bad	Good	Normal	Bad	Good	Normal	Bad
P Steel	😊	😊	😊	😊	😊	😊	😊	😊	😊
M Stainless steel	😊	😊	😊	😊	😊	😊	😊	😊	😊
K Cast iron							😞	😞	😞
N Non-ferrous metal									😞
S Heat resistant alloy, Ti alloy				😊	😊	😊	😊	😊	😊

[illegible]

☐ Make-to-order

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

A bar chart comparing the number of pieces for two products. The vertical axis represents the number of pieces, ranging from 0 to 500 in increments of 100. The horizontal axis lists the products. The bar for ZCC-CT is yellow and reaches 473 pieces. The bar for Similar product of company A is pink and reaches 428 pieces.

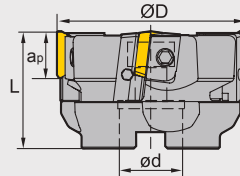
Product	Number of pieces
ZCC-CT	473
Similar product of company A	428

Face milling tools

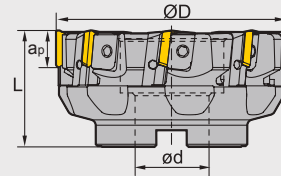
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**FMP01** P M K

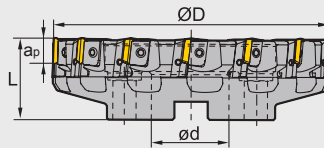
A-type coupling



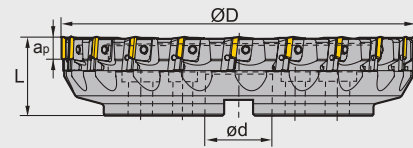
B-type coupling



C-type coupling



D-type coupling



Specification of tools

Type	Stock		Basic dimensions(mm)				Number of teeth Z	Type of coupling	Weight (kg)
	R	L	ØD	ød	L	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

△Make-to-order

Indexable milling tools

Face milling tools

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

Tools code key
B24-B25Grade selection guide
B19-B23Technical data
B234-B240

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

		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							😞	😞	😞	😞		😞	😞	

[illegible]

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

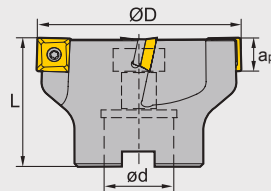
Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				V _c (m/min)	f _z (mm/z)
P	Low-carbon steel、 Soft steel	≤ 180	YBC301	270 (220-350)	0.2 (0.1-0.4)
			YBM351	220 (180-300)	0.2 (0.08-0.3)
			YBG202	270 (200-360)	0.2 (0.1-0.3)
			YC30S	140 (100-220)	0.22 (0.1-0.3)
	High-carbon steel、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

Face milling tools

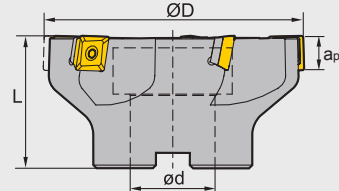
Kr:90°

**FMP02** P M K S

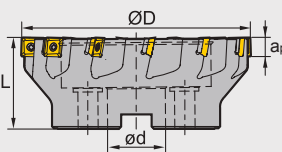
A-type coupling



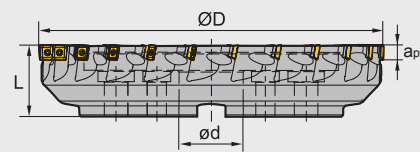
B-type coupling



C-type coupling



D-type coupling



Specification of tools

Type	Stock	Basic dimensions(mm)				Number of teeth Z	Type of coupling	Weight (kg)
		ØD	ød	L	apmax			
FMP02 -040-A16-SE09-04	△	40	16	40	6.7	4	A	0.2
-040-A16-SE09-06	△	40	16	40	6.7	6	A	0.22
-050-A22-SE09-05	▲	50	22	40	6.7	5	A	0.3
-050-A22-SE09-07	△	50	22	40	6.7	7	A	0.313
-063-A22-SE09-06	▲	63	22	40	6.7	6	A	0.5
-063-A22-SE09-08	△	63	22	40	6.7	8	A	0.479
-080-A27-SE09-08	▲	80	27	50	6.7	8	A	0.9
-080-A27-SE09-10	△	80	27	50	6.7	10	A	1.079
-100-B32-SE09-08	▲	100	32	50	6.7	8	B	1.7
-100-B32-SE09-10	△	100	32	50	6.7	10	B	1.7
-125-B40-SE09-12	△	125	40	63	6.7	12	B	2.6

▲ Stock available

△ Make-to-order

Indexable
milling tools

Face milling tools



B MILLING

Indexable Milling Tools

Specification of tools

Type	Stock	Basic dimensions(mm)				Number of teeth Z	Type of coupling	Weight (kg)
		ØD	ød	L	apmax			
FMP02 -050-A22-SE12-03	▲	50	22	40	10.8	3	A	0.3
-063-A22-SE12-04	▲	63	22	40	10.8	4	A	0.4
-080-A27-SE12-04	▲	80	27	50	10.8	4	A	0.9
-100-B32-SE12-05	▲	100	32	50	10.8	5	B	1.2
-125-B40-SE12-06	▲	125	40	63	10.8	6	B	3.1
-160-C40-SE12-08	▲	160	40	63	10.8	8	C	4.1
-200-C60-SE12-10	△	200	60	63	10.8	10	C	5.718
-250-C60-SE12-12	▲	250	60	63	10.8	12	C	11.1
-050-A22-SE12-04	▲	50	22	40	10.8	4	A	0.3
-063-A22-SE12-05	▲	63	22	40	10.8	5	A	0.4
-080-A27-SE12-06	▲	80	27	50	10.8	6	A	0.8
-100-B32-SE12-07	▲	100	32	50	10.8	7	B	1.2
-125-B40-SE12-08	▲	125	40	63	10.8	8	B	3.0
-160-C40-SE12-12	▲	160	40	63	10.8	12	C	3.9
-050-A22-SE12-05	▲	50	22	40	10.8	5	A	0.2
-063-A22-SE12-06	▲	63	22	40	10.8	6	A	0.4
-080-A27-SE12-08	▲	80	27	50	10.8	8	A	0.8
-100-B32-SE12-10	▲	100	32	50	10.8	10	B	1.2
-125-B40-SE12-12	▲	125	40	63	10.8	12	B	2.9
-160-C40-SE12-15	△	160	40	63	10.8	15	C	4.061
-200-C60-SE12-16	▲	200	60	63	10.8	16	C	6.1
-250-C60-SE12-18	▲	250	60	63	10.8	18	C	10.9
-315-D60-SE12-24	▲	315	60	63	10.8	24	D	21.6

▲ Stock available △ Make-to-order

Spare parts

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

Tools code key
B24-B25

Grade selection guide
B19-B23

Technical data
B234-B240

Selection of inserts

Selection of inserts

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

Workpiece material	Steel	Stainless steel	Cast iron	Non-ferrous metal	Heat resistant alloy, Ti alloy																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													</
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Indexable milling tools

Face milling tools

Chipbreaker selection for FMP02 milling inserts

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



Features of

FMP02

Series Milling Tools



Inserts designed with new geometries and coated grades for optimized high efficiency machining in different working conditions.



Unique geometric design resulting in true 90° square shoulder cutting.



Upgraded insert structure, greatly improves tool life.



Large positive rake angle resulting in easier cutting with less tool pressure.



Screw down clamping resulting in better chip evacuation.

► Recommended cutting parameters

	Workpiece material	Hardness HB	Insert grade	Cutting parameters			
				V _c (m/min)	f _z (mm/z)		
					-APF	-APM	-APR
P	Low-carbon steel, Soft steel	≤ 180	YBG202	270(200-360)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
			YB9320	270(200-360)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
	High-carbon steel, Alloy steel	180-280	YBM351	240 (200-320)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
			YBG202	240 (180-350)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
			YB9320	240 (180-350)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
	Alloy tool steel	280-350	YBM351	220 (180-300)	0.1(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
			YBG202	220 (170-340)	0.1(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
			YB9320	220 (170-340)	0.1(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
M	Stainless steel	≤ 270	YBM351	150 (120-240)	0.1(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
			YBG202	160 (110-270)	0.1(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
			YB9320	160 (110-270)	0.1(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
K	Cast iron	180-250	YBG202	160 (120-200)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
			YBD152	270 (150-300)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
S	Difficult-to-machine materials	≤ 400	YBS303	100 (60-120)	0.1(0.08-0.2)	0.15 (0.1-0.25)	--

Case for FMP02

Workpiece material: 45[#]

Hardness: 175-190 (HB)

Cooling: Air cooling

Tool: FMP02-100-B32-SE12-10

Insert: SEET120308PER-APM (YB9320)

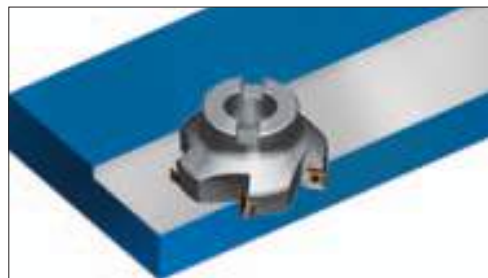
Data:

Data 1: V_c=200m/min, f_z=0.15mm/z,

Ap=7mm, Ae=5mm

Data 2: V_c=200m/min, f_z=0.25mm/z,

Ap=7mm, Ae=5mm



● SEET120308PER-APM inserts tests

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



-APM



Product of company B

Results:

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



B MILLING

Indexable Milling Tools

Face milling tools

Kr:90°



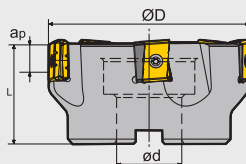
Face milling

Step shoulder

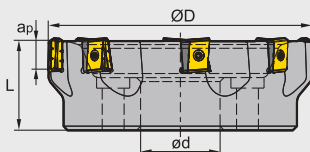
FMP03 P M K



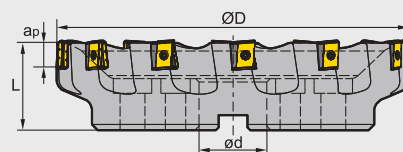
B-type coupling



C-type coupling



D-type coupling



Specification of tools

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

▲Stock available

△Make-to-order

Spare parts

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

Tools code key

B26–B27

Grade selection guide

B19–B23

Technical data

B245–B250

Technical information

B234–B240

Selection of inserts

😊 Good working condition

😐 Normal working condition

😞 Bad working condition

Workpiece material	P Steel	😊😊
--------------------	---------	--

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

Recommended cutting parameters

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

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

Case for FMP03



Tool type: FMP03-200-C60-LN25-08

Insert type/grade: LNKT2510-ZR/YBG302

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

Workpiece material: 45#

Hardness(HB): 190

Cooling system: Dry cutting

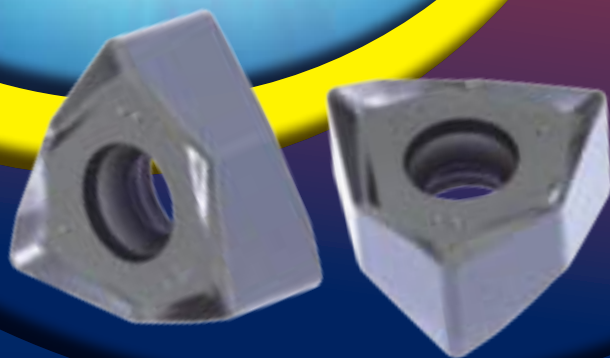
Cutting parameters: Vc=130m/min, ap=12mm, fz=0.5mm/z
ae=140mm



FMP12

Series Milling Tools

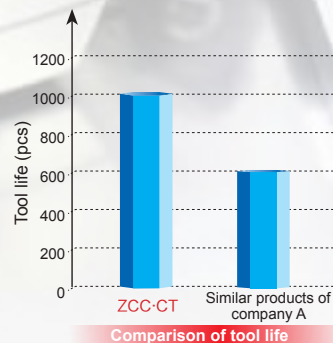
Kr:90°



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

Application case

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



Face milling tools

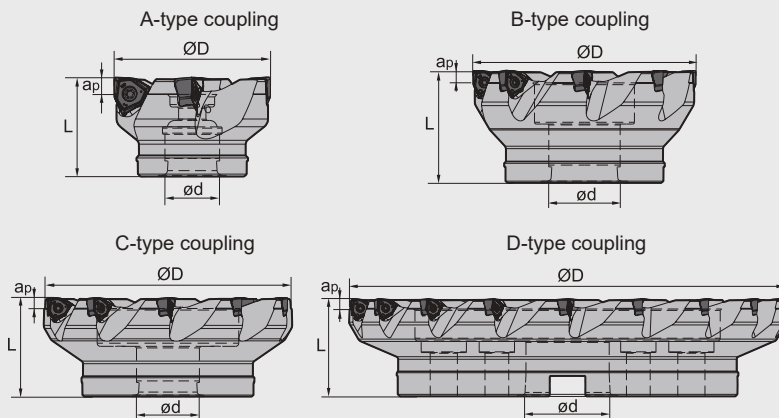
Kr:90°



FMP12 P K N



Specification of tools



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

▲ Stock available

△ Make-to-order

Spare parts

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

Tools code key
B24-B25Grade selection guide
B19-B23Technical data
B234-B240Indexable
milling tools

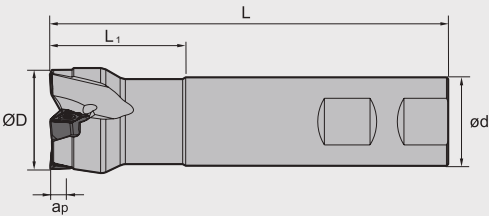
Face milling tools

Face milling tools

Kr:90°



FMP12 P K



Specification of tools

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

▲Stock available △Make-to-order

Spare parts

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

Tools code key
B24–B25

Grade selection guide
B19–B23

Technical data
B234–B240

Selection of inserts

😊 Good working condition

😐 Normal working condition

😞 Bad working condition

Workpiece material	Good working condition								Normal working condition								Bad working condition													
	P	M	K	N	S	P	M	K	N	S	P	M	K	N	S	P	M	K	N	S										
Steel	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊
Stainless steel	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊
Cast iron	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊
Non-ferrous metal	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊
Heat resistant alloy, Ti alloy	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊

Insert shape	Type	Basic dimensions(mm)						CVD Coating						PVD Coating						Cermet	Cemented carbide									
		L	ØI.C	S	ød	bs	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG320	YBG302		YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	WNHU060404PNR-GM	5.7	9.525	4.0	3.5	1.35	0.4				★	★						★	★											
	WNHU060408PNR-GM	5.7	9.525	4.0	3.5	1.35	0.8				★	★						★	★											
	WNHU080608PNR-GM	7.7	12.7	5.4	4.4	1.6	0.8				★	★						★	★											
	WNHU080612PNR-GM	7.7	12.7	5.4	4.4	1.6	1.2				★	★						★	★											
	WNHU080616PNR-GM	7.7	12.7	5.4	4.4	1.6	1.6				★	★						★	★											
	WNMU060408PNN-GM	5.7	9.525	4.0	3.5	1.35	0.8				★	★						★	★											
	WNMU080608PNN-GM	7.7	12.7	5.4	4.4	1.6	0.8				★	★						★	★											
	WNHU080608PNR-LH	7.7	12.7	5.4	4.4	1.6	0.8																				★			

★Recommended grade (always stock available)

●Available grade (always stock available)

○Make-to-order

Indexable milling tools

Face milling tools

Recommended cutting parameters

	Workpiece material	Hardness HB	Insert grade	Cutting parameters		
				V _c (m/min)	f _z (mm/z)	a _p max(mm)
P	Low-carbon steel, Soft steel	≤180	YBM253 YBG205 YB9320	280(220-360)	0.2 (0.1-0.4)	5.7(WN06) 7.7(WN08)
	High-carbon steel, Alloy steel	180-280	YBM253 YBG205 YB9320	260 (200-340)	0.2 (0.1-0.4)	
	Alloy tool steel	280-350	YBM253 YBG205 YB9320	240 (180-320)	0.2(0.1-0.4)	
K	Cast iron	180-250	YBD152	280 (150-320)	0.2(0.1-0.4)	
N	Aluminium alloy	--	YD101	300-	0.25(0.1-0.4)	



B MILLING

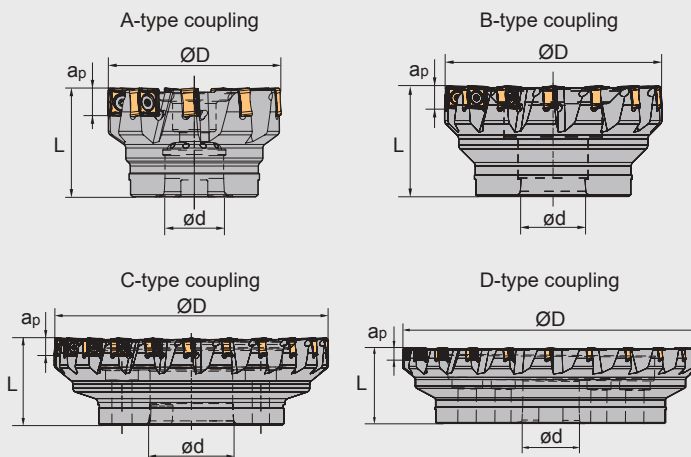
Indexable Milling Tools

Face milling tools

Kr:88°



FMP17 **P** **M** **K** **S**



Specification of tools

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

▲ Stock available

△ Make-to-order

Indexable
milling tools

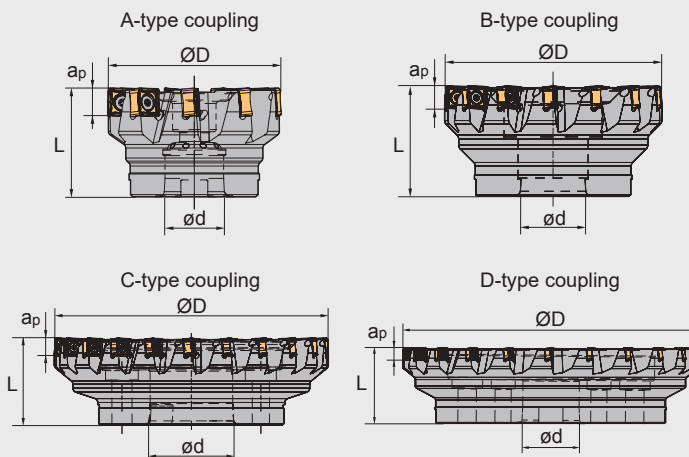
Face milling tools

Face milling tools

Kr:88°



FMP17 P M K S



Specification of tools

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

▲Stock available

△Make-to-order

Spare parts

Diameter ØD	Insert	Insert screw		Wrench		
						
Ø50-Ø63	SNGX□□PNN-GH/GL/GM SNMX□□□-GH/GL/GM	IRM4×10		WT15IP		
Ø80-Ø125				WT15IS		
Ø160-Ø400				WT15IT		
Diameter ØD	Insert	Insert screw	Wedge screw	Adjustment block	Wrench	
						
Ø125-Ø200	SNG□□XPNN-GH/GL/GM SNMX□□□-GH/GL/GM SNCU120420-W4	IRM4×10	DM6X20A	ADJ-M6X1.0A	WT15IT	

Tools code key
B24-B25Grade selection guide
B19-B23Technical data
B234-B240Indexable
milling tools

Face milling tools

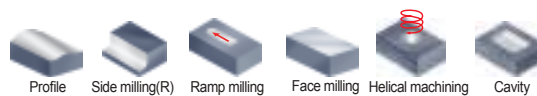
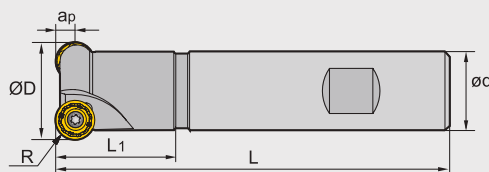
Indexable Milling Tools

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

[illegible][illegible]☐ Make-to-order

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

Face milling tools

**FMR01** P M K S

Specification of tools

Type	Stock	Basic dimensions(mm)						Number of teeth Z	Weight (kg)
		ØD	ød	L	L1	R	apmax		
FMR01 -025-XP20-RC10-02	▲	25	20	100	30	5	5	2	0.2
-032-XP25-RC10-02	▲	32	25	120	35	5	5	2	0.5
-040-XP32-RC12-03	▲	40	32	120	40	6	6	3	0.7
-050-XP32-RC12-03	▲	50	32	120	40	6	6	3	0.8

▲ Stock available

△ Make-to-order

Indexable
milling tools

Face milling tools

Spare parts

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

Tools code key
B24-B25Grade selection guide
B19-B23Technical data
B234-B240

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

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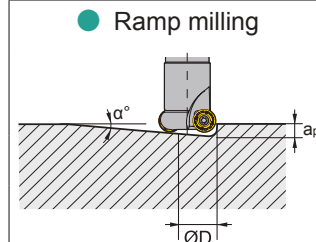
★ Recommended grade (always stock available) ● Available grade (always stock available) ○ Make-to-order

➤ Recommended cutting parameters

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

➤ Ramp milling, helical interpolation milling

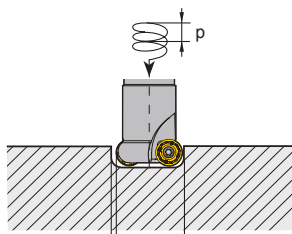
Insert	Diameter ØD(mm)	Ramp milling			Helical interpolation milling	
		Max. cutting depth	Max. cutting depth	Min. length	Min. diameter	Max. diameter
		a_p (mm)	α°	L_m (mm)	ØD ₁ (mm)	(mm)
RCKT10**	25	5	14.4	19.5	40	5
	32	5	8.4	34	54	5
RCKT12**	40	6	10.3	33.2	68	6
	50	6	7.1	48	88	6



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

α : Plunge angle

Helical interpolation milling



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

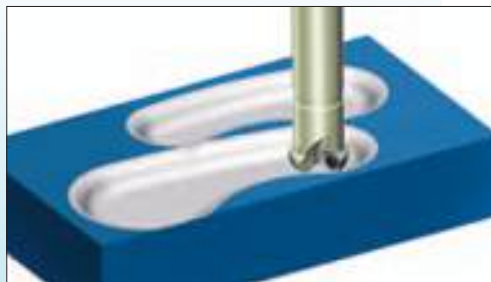
α : Helix angle

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

Indexable
milling tools

Face milling tools

Case for FMR01



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



Tool type: FMR01-025-XP20-RC10-02

Insert type/grade: RCKT10T3MO-DM/YBG202

● Comparison of insert abrasion

ZCC-CT



22minutes later

Similar overseas products



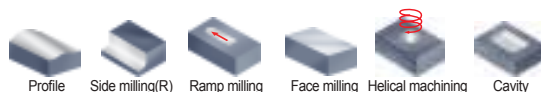
22minutes later



MILLING

Indexable Milling Tools

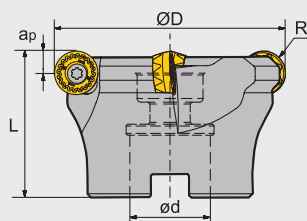
Face milling tools



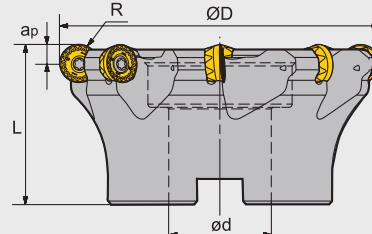
FMR02 P M K S



A-type coupling



B-type coupling



Specification of tools

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

▲ Stock available

△ Make-to-order

Spare parts

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

Tools code key

B24-B25

Grade selection guide

B19-B23

Technical data

B234-B240

[illegible]

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

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

Face milling tools

Workpiece material	K Cast iron				
	N Non-ferrous metal				

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

B 103



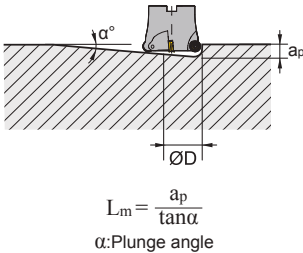
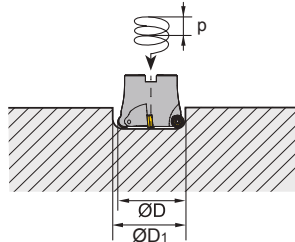
► Recommended cutting parameters

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

Indexable
milling tools

Face milling tools

➤ Ramp milling, helical interpolation milling

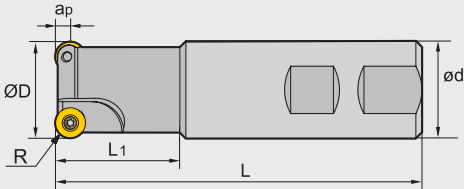
● Ramp milling  $L_m = \frac{a_p}{\tan \alpha}$ α: Plunge angle	Insert	Diameter ØD(mm)	Ramp milling			Helical interpolation milling	
			Max. cutting depth	Max. cutting depth	Min. length	Min. diameter	Max. diameter
			ap(mm)	α°	L _m (mm)	ØD ₁ (mm)	(mm)
● Helical interpolation milling  $P = \tan \alpha \times \pi \times D_1$ α: Helix angle	RCKT12**	50	6	7	48.9	88	6
		63	6	5.1	67.5	114	6
		80	6	3.7	94.1	148	6
		100	6	2.7	127.2	188	6
	RCKT16**	63	8	8	56.9	110	8
		80	8	5.6	81.6	144	8
		100	8	4.1	110.8	184	8
		125	8	3.4	136.7	234	8
	RCKT20**	80	10	8	71.2	140	10
		100	10	5.7	100.2	180	10
		125	10	4.2	136.2	230	10
		160	10	3	190.8	300	10

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

Face milling tools



FMR03 P M K S



Specification of tools

Type	Stock	Basic dimensions(mm)						Number of teeth Z	Weight (kg)
		ØD	ød	L	L1	R	apmax		
FMR03 -016-XP16-RD08-02	▲	16	16	100	25	4	4	2	0.1
-025-XP25-RD08-02	▲	25	25	100	30	4	4	2	0.3
-032-XP32-RD10-02	▲	32	32	120	40	5	5	2	0.7
-040-XP32-RD12-03	▲	40	32	120	40	6	6	3	0.7
-050-XP32-RD12-04	▲	50	32	120	40	6	6	4	0.8

▲Stock available △Make-to-order

Spare parts

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

Tools code key
B24–B25

Grade selection guide
B19–B23

Technical data
B234–B240

Selection of inserts

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
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Recommended cutting parameters

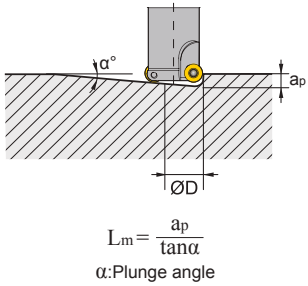
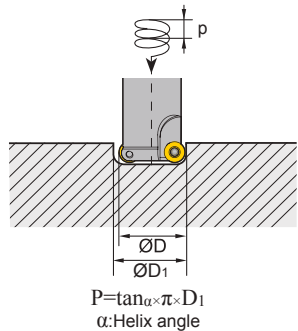
Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				V _c (m/min)	f _z (mm/z)
P	Low-carbon steel、Soft steel	≤180	YBM251 YBC301	270 (220-350)	0.2 (0.08-0.45)
			YBM351 YBG302	220 (180-300)	0.25 (0.15-0.45)
			YBG202 YBG205	270 (200-360)	0.2 (0.1-0.45)
	High-carbon steel、Alloy steel	180-280	YBM251 YBC301	240 (200-320)	0.2 (0.08-0.45)
			YBM351 YBG302	200 (160-280)	0.25 (0.15-0.45)
			YBG202 YBG205	240 (180-350)	0.2 (0.1-0.45)
	Alloy tool steel	280-350	YBM251 YBC301	220 (180-300)	0.2 (0.08-0.45)
			YBM351 YBG302	180 (150-250)	0.25 (0.15-0.45)
			YBG202 YBG205	220 (170-340)	0.2 (0.1-0.45)
M	Stainless steel	≤270	YBG205	150 (120-240)	0.2 (0.08-0.45)
			YBM251	150 (120-240)	0.2 (0.08-0.45)
			YBM351	150 (100-220)	0.25 (0.1-0.45)
			YBG202 YBG205	160 (110-270)	0.2 (0.1-0.45)
K	Cast iron	180-250	YBG302	210 (120-300)	0.2 (0.1-0.45)
S	Difficult-to-machine materials	≤400	YBS203 YBS303	100 (60-120)	0.15 (0.1-0.3)



MILLING

Indexable Milling Tools

➤ Ramp milling, helical interpolation milling

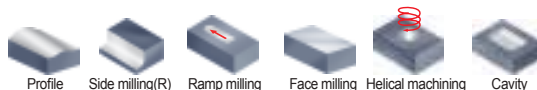
● Ramp milling 	Insert	Diameter ØD(mm)	Ramp milling			Helical interpolation milling	
			Max. cutting depth	Max. cutting depth	Min. length	Min. diameter	Max. diameter
			ap(mm)	α°	Lm(mm)	ØD1(mm)	(mm)
● Helical interpolation milling 	RD*08**	16	4	12.2	18.5	24	4
		25	4	8.8	25.8	42	4
	RD*10**	32	5	8.4	34	54	5
	RD*12**	40	6	10.3	33	68	6
		50	6	7.1	48	88	6

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

Indexable
milling tools

Face milling tools

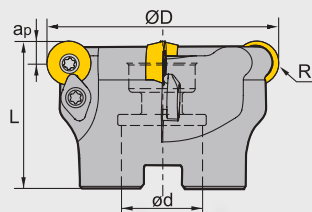
Face milling tools



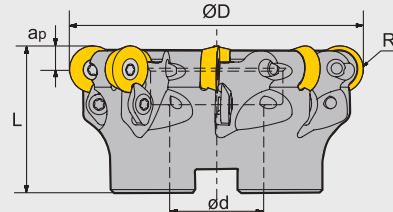
FMR04 P M K



A-type coupling



B-type coupling



Specification of tools

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

▲Stock available

△Make-to-order

Indexable
milling tools

Face milling tools

Spare parts

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

Tools code key
B24-B25Grade selection guide
B19-B23Technical data
B234-B240

😊 Good working condition 😐 Normal working condition 😞 Bad working condition



Insert shape	Type	Basic dimensions(mm)			CVD Coating				PVD Coating						Cermet	Cemented carbide										
		ØI.C	S	ød	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBS320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	RDKW1204MO	12.0	4.76	4.4	●		●		●			●	★		●											
	RDKW1605MO	16.0	5.56	5.5	○				○			○	★		○											
	RDKW2006MO	20.0	6.35	6.5	○				○				○													

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

Face milling tools

▶ Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				Vc(m/min)	f(mm/z)
P	Low-carbon steel、Soft steel	≤180	YBM251 YBC301	270 (220-350)	0.2 (0.08-0.45)
			YBM351 YBG302	220 (180-300)	0.25 (0.15-0.45)
			YBG202 YBG205	270 (200-360)	0.2 (0.1-0.45)
	High-carbon steel、Alloy steel	180-280	YBM251 YBC301	240 (200-320)	0.2 (0.08-0.45)
			YBM351 YBG302	200 (160-280)	0.25 (0.15-0.45)
			YBG202 YBG205	240 (180-350)	0.2 (0.1-0.45)
	Alloy tool steel	280-350	YBM251 YBC301	220 (180-300)	0.2 (0.08-0.45)
			YBM351 YBG302	180 (150-250)	0.25 (0.15-0.45)
			YBG202 YBG205	220 (170-340)	0.2 (0.1-0.45)
M	Stainless steel	≤270	YBG205	150 (120-240)	0.2 (0.08-0.45)
			YBM251	150 (120-240)	0.2 (0.08-0.45)
			YBM351 YBG302	150 (100-220)	0.25 (0.1-0.45)
			YBG202 YBG205	160 (110-270)	0.2 (0.1-0.45)
K	Cast iron	180-250	YBG302	210 (120-300)	0.2 (0.1-0.45)

➤ Ramp milling, helical interpolation milling

Insert	Diameter ØD(mm)	Ramp milling			Helical interpolation milling	
		Max. cutting depth	Max. cutting depth	Min. length	Min. diameter	Max. diameter
		a_p (mm)	α°	L_m (mm)	$\varnothing D_1$ (mm)	(mm)
RD*12**	50	6	7.1	48	88	6
	63	6	5.1	67	114	6
	80	6	3.6	93	148	6
RD*16**	63	8	8	56.5	110	8
	80	8	5.6	81.5	144	8
	100	8	4.1	110.5	184	8
	125	8	3.4	136.5	234	8
RD*120**	125	10	4.2	136.2	230	10
	160	10	3	190.5	300	10

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

Case for FMR04



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



Tool type: FMR04-063-A22-RD12-04

Insert type/grade: RDKW1204MO/YBG202

● Abrasion comparison after 90 minutes cavity milling

ZCC-CT



Similar overseas products





B MILLING

Indexable Milling Tools

Square shoulder milling tools

Kr:90°



EMP01 P M K S N



Straight shank



Specification of tools

Type	Stock	Basic dimensions(mm)					Number of teeth Z	Weight (kg)
		ØD	ød	L	L ₁	apmax		
EMP01								
Straight shank								
-010-G10-AP07-02C(25/85)	△	10	10	85	25	6.0	2	0.043
-010-G10-AP07-02C(25/120)	△	10	10	120	25	6.0	2	0.063
-012-G12-AP07-02C(25/85)	△	12	12	85	25	6.0	2	0.061
-012-G12-AP07-02C(25/120)	△	12	12	120	25	6.0	2	0.089
-014-G16-AP07-03C(25/85)	△	14	16	85	25	6.0	3	0.104
-014-G16-AP07-03C(25/120)	△	14	16	120	25	6.0	3	0.153
-016-G16-AP07-03C(25/85)	△	16	16	85	25	6.0	3	0.112
-016-G16-AP07-03C(25/120)	△	16	16	120	25	6.0	3	0.162
-012-G16-AP11-01	▲	12	16	85	25	10.5	1	0.1
-016-G16-AP11-02	▲	16	16	90	25	10.5	2	0.1
-016-G16-AP11-02C(25/85)	△	16	16	85	25	10.5	2	0.108
-016-G16-AP11-02C(25/120)	△	16	16	120	25	10.5	2	0.16
-016-G16-AP11-02C(25/180)	△	16	16	180	25	10.5	2	0.248
-020-G16-AP11-03C(25/85)	△	20	16	85	25	10.5	3	0.121
-020-G20-AP11-02	▲	20	20	100	30	10.5	2	0.2
-020-G20-AP11-02C(30/100)	△	20	20	100	30	10.5	2	0.18
-020-G20-AP11-02C(30/150)	△	20	20	150	30	10.5	2	0.312
-020-G20-AP11-02C(30/200)	△	20	20	200	30	10.5	2	0.401
-020-G20-AP11-03C(30/100)	△	20	20	100	30	10.5	3	0.2
-020-G20-AP11-03C(30/150)	△	20	20	150	30	10.5	3	0.357
-020-G20-AP11-03C(30/200)	△	20	20	200	30	10.5	3	0.424
-025-G25-AP11-03	▲	25	25	115	35	10.5	3	0.4
-025-G25-AP11-03C(35/115)	△	25	25	115	35	10.5	3	0.357
-025-G25-AP11-03C(35/170)	△	25	25	170	35	10.5	3	0.577
-025-G25-AP11-03C(35/220)	△	25	25	220	35	10.5	3	0.758
-025-G25-AP11-04C(35/115)	△	25	25	115	35	10.5	4	0.376
-025-G25-AP11-04C(35/170)	△	25	25	170	35	10.5	4	0.575
-025-G25-AP11-04C(35/220)	△	25	25	220	35	10.5	4	0.686

▲ Stock available △ Make-to-order

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

Effective cutting depth/Overall length

Tools code key
B24-B25

Grade selection guide
B19-B23

Technical data
B234-B240

Indexable
milling tools

Square shoulder milling tools

Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Weight (kg)
			ØD	ød	L	L ₁	apmax		
EMP01 Straight shank	-030-G25-AP11-04C(35/115)	△	30	25	115	35	10.5	4	0.411
	-030-G25-AP11-04C(35/170)	△	30	25	170	35	10.5	4	0.61
	-030-G25-AP11-04C(35/220)	△	30	25	220	35	10.5	4	0.791
	-032-G32-AP11-04	▲	32	32	125	40	10.5	4	0.7
	-032-G32-AP11-04C(45/125)	△	32	32	125	45	10.5	4	0.673
	-032-G32-AP11-04C(45/190)	△	32	32	190	45	10.5	4	1.057
	-032-G32-AP11-04C(45/260)	△	32	32	260	45	10.5	4	1.47
	-032-G32-AP11-05C(45/125)	△	32	32	125	45	10.5	5	0.71
	-032-G32-AP11-05C(45/190)	△	32	32	190	45	10.5	5	1.054
	-032-G32-AP11-05C(45/260)	△	32	32	260	45	10.5	5	1.53
	-025-G25-AP16-02	▲	25	25	115	35	15.5	2	0.4
	-025-G25-AP16-02C(35/115)	△	25	25	115	35	15.5	2	0.374
	-025-G25-AP16-02C(35/170)	△	25	25	170	35	15.5	2	0.496
	-025-G25-AP16-02C(35/220)	△	25	25	220	35	15.5	2	0.658
	-030-G25-AP16-02C(35/115)	△	30	25	115	35	15.5	2	0.521
	-030-G25-AP16-02C(35/170)	△	30	25	170	35	15.5	2	0.632
	-030-G25-AP16-02C(35/220)	△	30	25	220	35	15.5	2	0.78
	-032-G32-AP16-03	▲	32	32	125	40	15.5	3	0.7
	-032-G32-AP16-03C(45/125)	△	32	32	125	45	15.5	3	0.607
	-032-G32-AP16-03C(45/190)	△	32	32	190	45	15.5	3	0.976
	-032-G32-AP16-03C(45/260)	△	32	32	260	45	15.5	3	1.374
	-040-G32-AP16-04	▲	40	32	130	42	15.5	4	0.8
	-040-G32-AP16-04C(45/125)	△	40	32	125	45	15.5	4	0.716
	-040-G32-AP16-04C(45/190)	△	40	32	190	45	15.5	4	1.085
	-040-G32-AP16-04C(45/260)	△	40	32	260	45	15.5	4	1.483
	-050-G32-AP16-05	▲	50	32	135	45	15.5	5	1.0
	-050-G32-AP16-05C(45/125)	△	50	32	125	45	15.5	5	0.825
	-050-G32-AP16-05C(45/190)	△	50	32	190	45	15.5	5	1.195
	-050-G32-AP16-05C(45/260)	△	50	32	260	45	15.5	5	1.592
	-063-G32-AP16-06	▲	63	32	135	45	15.5	6	1.4

▲ Stock available △ Make-to-order

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

Effective cutting depth/Overall length

Spare parts

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

Tools code key
B24-B25

Grade selection guide
B19-B23

Technical data
B234-B240

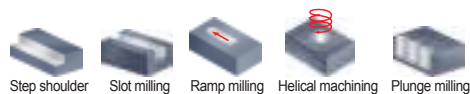


B MILLING

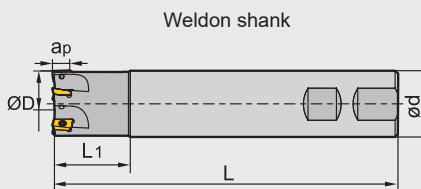
Indexable Milling Tools

Square shoulder milling tools

Kr:90°



EMP01 P M K S N



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

△ Make-to-order

Spare parts

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

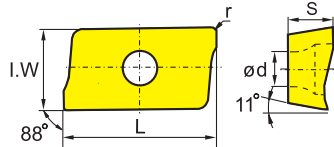


Tools code key
B24-B25

Grade selection guide
B19-B23

Technical data
B234-B240

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

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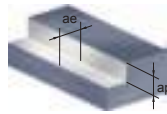
★ Recommended grade (always stock available) ● Available grade (always stock available) ○ Make-to-order

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

B MILLING Indexable Milling Tools

1 Square shoulder milling

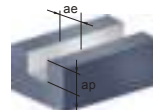
➤ Recommended cutting parameters (D: Diameter)



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

2 Slot milling

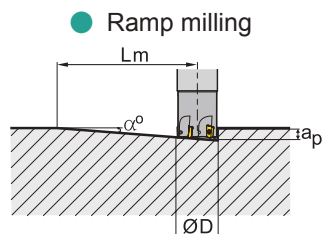
➤ Recommended cutting parameters (D: Diameter)



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

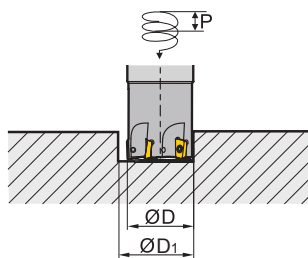
3 Ramp milling, helical interpolation milling

▶▶ Recommended cutting parameters (D: Diameter)



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

● Helical interpolation milling



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

Diameter ØD(mm)	APKT Ramp milling, helical interpolation milling (Inserts-7)				
	Ramp milling			Helical interpolation milling	
	Maximum cutting depth ap(mm)	Maximum ramp angle α°	Minimum length Lm(mm)	Minimum diameter ØD1(mm)	Maximum pitch (mm)
10	6	6	57	12	2.0
12	6	4	85	15	2.0
14	6	3	114	18	2.0
16	6	2.5	137	21	2.0
Diameter ØD(mm)	APKT Ramp milling, helical interpolation milling (Inserts-11)				
	Ramp milling			Helical interpolation milling	
	Maximum cutting depth ap(mm)	Maximum ramp angle α°	Minimum length Lm(mm)	Minimum diameter ØD1(mm)	Maximum pitch (mm)
16	10.0	10.0	56.7	20.0	2.0
20	10.0	5.0	114.4	28.0	2.0
25	10.0	4.5	127.0	40.0	2.0
30	10.0	3.5	153.0	48.0	2.0
32	10.0	3.0	190.8	56.0	2.0
40	10.0	2.0	286.4	70.0	2.0
Diameter ØD(mm)	APKT Ramp milling, helical interpolation milling (Inserts-16)				
	Ramp milling			Helical interpolation milling	
	Maximum cutting depth ap(mm)	Maximum ramp angle α°	Minimum length Lm(mm)	Minimum diameter ØD1(mm)	Maximum pitch (mm)
25	15	6	142	32	2.0
30	15	5	171	40	2.0
32	15	4.5	214	45	2.0
40	15	2.5	343	60	2.0
50	15	1.5	572	80	2.0
63	15	1	859	105	2.0

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

Case for EMP01



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



Insert specification/grade: APKT160408-APM/YB9320

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

●Comprehensively improve mould cavity machining efficiency



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

Indexable
milling tools

Square shoulder milling tools

Square shoulder milling tools

Kr:90°



EMP02

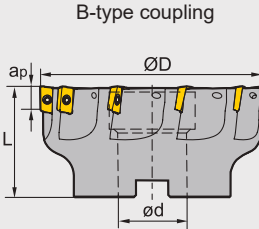
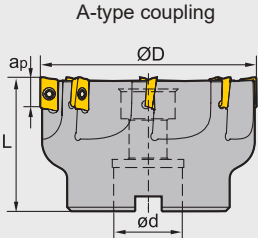
P

M

K

S

N



Specification of tools

Type	Stock	Basic dimensions(mm)				Number of teeth Z	Type of coupling	Weight (kg)
		ØD	ød	L	apmax			
EMP02 -050-A22-AP11-06	▲	50	22	40	10.5	6	A	0.3
-063-A22-AP11-08	▲	63	22	40	10.5	8	A	0.6
-080-A27-AP11-08	▲	80	27	50	10.5	8	A	1.2
-100-B32-AP11-10	▲	100	32	50	10.5	10	B	1.7
-050-A22-AP16-05	▲	50	22	40	15.5	5	A	0.3
-063-A22-AP16-06	▲	63	22	40	15.5	6	A	0.5
-080-A27-AP16-07	▲	80	27	50	15.5	7	A	1.1
-100-B32-AP16-08	▲	100	32	50	15.5	8	B	1.6
-125-B40-AP16-10	▲	125	40	63	15.5	10	B	3.2
-160-B40-AP16-10	▲	160	40	63	15.5	10	B	6.3

▲Stock available

△Make-to-order

Spare parts

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



Tools code key

B24–B25

Grade selection guide

B19–B23

Technical data

B234–B240

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

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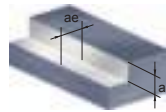
★ Recommended grade (always stock available) ● Available grade (always stock available) ○ Make-to-order

B MILLING Indexable Milling Tools

►► Chipbreaker selection

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

1 Square shoulder milling



►► Recommended cutting parameters (D: Diameter)

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

Indexable milling tools

Square shoulder milling tools

Square shoulder milling tools

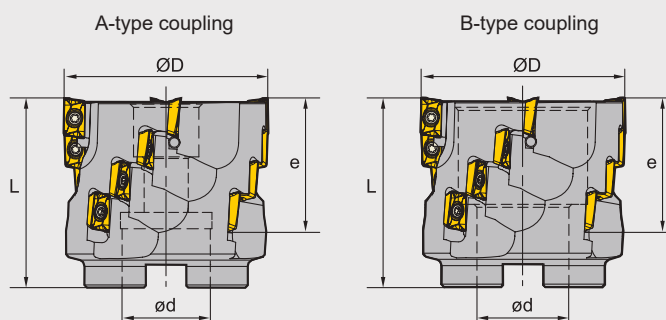
Kr:90°



EMP03 P M K S N



Specification of tools



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

▲ Stock available

△ Make-to-order

Indexable
milling tools

Square shoulder milling tools

Spare parts

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

Tools code key
B24-B25Grade selection guide
B19-B23Technical data
B234-B240



Square shoulder milling tools

Kr:90°



Step shoulder



Slot milling

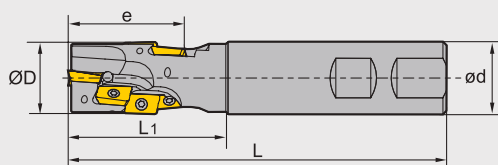


Side milling

EMP04 P M K S N



Weldon shank



Specification of tools

Type	Stock	Basic dimensions(mm)					Number of teeth z	Number of inserts	Weight (kg)
		ØD	ød	L	L1	e			
EMP04 -020-XP20-AP11-01	▲	20	20	120	45	29.4	1	3	0.3
-025-XP25-AP11-02	▲	25	25	130	55	38.9	2	8	0.4
-032-XP32-AP11-02	▲	32	32	140	65	48.5	2	10	0.7
-040-XP40-AP11-02	▲	40	40	150	75	58.0	2	14	1.3

▲ Stock available

△ Make-to-order

Spare parts

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

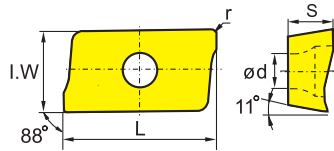


Tools code key
B24-B25

Grade selection guide
B19-B23

Technical data
B234-B240

Selection of inserts



😊 Good working condition 😐 Normal working condition 😞 Bad working condition

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

Insert shape	Type	Basic dimensions(mm)					CVD Coating						PVD Coating						Cermet	Cemented carbide								
		L	I.W	S	ød	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG320	YBG302		YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101
	APKT11T304-APF	12.24	6.6	3.6	2.8	0.4		●		●							★											
	APKT11T308-APF	12.24	6.6	3.6	2.8	0.8		●		●							★					●	●					
	APKT11T304-APM	12.24	6.6	3.6	2.8	0.4				●							★											
	APKT11T308-APM	12.24	6.6	3.6	2.8	0.8				●		●					★					●	●					
	APKT11T312-APM	12.24	6.6	3.6	2.8	1.2						●					★											
	APKT11T316-APM	12.24	6.6	3.6	2.8	1.6											★											
	APKT11T320-APM	12.24	6.6	3.6	2.8	2.0				●							★											
	APKT11T304-ALH	12.24	6.6	3.6	2.8	0.4																				★	★	
	APKT11T308-ALH	12.24	6.6	3.6	2.8	0.8																				★	○	

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

Indexable milling tools

Square shoulder milling tools

Chipbreaker selection

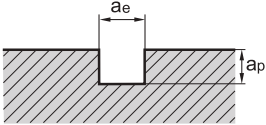
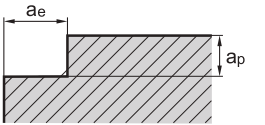
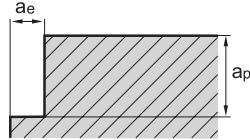
Classification	Application	For finishing	For semi-finishing
P		-APF	-APM
M		-APF	-APM
S		-APF	-APM
K		-APF	-APM
N		-ALH	



MILLING

Indexable Milling Tools

➤ Recommended cutting parameters

Slot milling	Square shoulder milling	Deep square shoulder milling
		
$a_e = D, a_p \leq 0.5D$	$a_e \leq 0.5D, a_p \leq 1.2D$	$a_e \leq 0.2D, a_p < \text{Cutting length of insert}$

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

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



4 available cutting edges and precise 90° square shoulder.

Double rake angle can effectively reduce cutting force.

High precision of cutting tool can achieve high quality and efficient roughing.

The Tangential assembling can change the cutting force of main direction to be borne by the thickness direction to realize the high rigidity of the cutting tool.

The optimized material of cutter body with high strength and special coating treatment achieves better wear-resistance and longer tool life.

Kr:90°

A New Generation of Tangential Milling Cutter **EMP09** Series

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

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

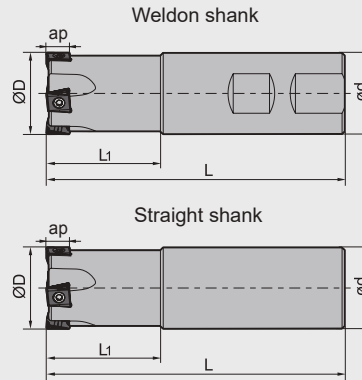
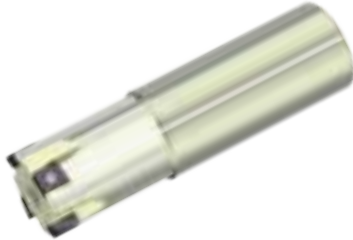


Square shoulder milling tools

Kr:90°



EMP09 P M K S



Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth z	Weight (kg)
			ØD	ød	L	L ₁	apmax		
EMP09 Weldon shank	-020-XP20-LN08-02C	▲	20	20	100	25	8.0	2	0.20
	-020-XP20-LN08-03C	▲	20	32	100	25	8.0	3	0.20
	-025-XP25-LN08-03C	▲	25	25	100	32	8.0	3	0.36
	-025-XP25-LN08-04C	▲	25	25	100	32	8.0	4	0.35
	-032-XP32-LN08-04C	▲	32	32	115	40	8.0	4	0.67
	-032-XP32-LN08-05C	▲	32	32	115	40	8.0	5	0.67
	-040-XP40-LN08-05C	▲	40	40	125	40	8.0	5	1.15
	-040-XP40-LN08-06C	▲	40	40	125	40	8.0	6	1.14
	-040-XP40-LN12-03C	▲	40	40	125	40	11.5	3	1.11
	-040-XP40-LN12-04C	▲	40	40	125	40	11.5	4	1.10
Straight shank	-020-G20-LN08-02C	▲	20	20	100	25	8.0	2	0.2
	-020-G20-LN08-03C	▲	20	20	100	25	8.0	3	0.2
	-025-G25-LN08-03C	▲	25	25	100	32	8.0	3	0.36
	-025-G25-LN08-04C	▲	25	25	100	32	8.0	4	0.35
	-032-G32-LN08-04C	▲	32	32	115	40	8.0	4	0.67
	-032-G32-LN08-05C	▲	32	32	115	40	8.0	5	0.67
	-040-G40-LN12-03C	▲	40	40	125	40	11.5	3	1.11
	-040-G40-LN12-04C	▲	40	40	125	40	11.5	4	1.10

▲ Stock available △ Make-to-order

Spare parts

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

Tools code key
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Grade selection guide
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Technical data
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Square shoulder milling tools **Kr:90°**

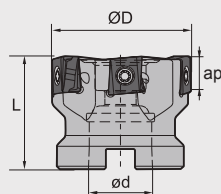
Face milling



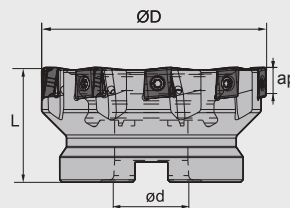
Step shoulder

EMP09 **P** **M** **K** **S**

A-type coupling



B-type coupling



➤ Specification of tools

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

▲ Stock available

△ Make-to-order

Indexable
milling tools

Square shoulder milling tools

Tools code key
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B MILLING

Indexable Milling Tools

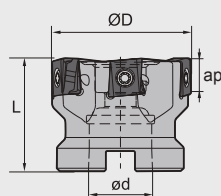
Square shoulder milling tools Kr:90°



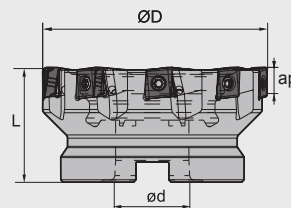
EMP09 P M K S



A-type coupling



B-type coupling



Specification of tools

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

▲ Stock available

△ Make-to-order

Spare parts

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

Tools code key
B24-B25

Grade selection guide
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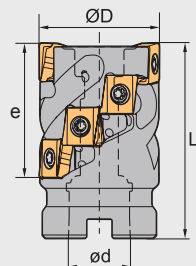
Technical data
B234-B240

Square shoulder milling tools

Kr:90°



EMP09 P M K S



Specification of tools

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

▲ Stock available

△ Make-to-order

Indexable milling tools

Square shoulder milling tools

Spare parts

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

Tools code key
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B MILLING

Indexable Milling Tools

Square shoulder milling tools

Kr:90°



Step shoulder

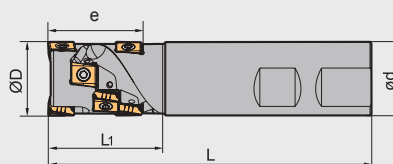
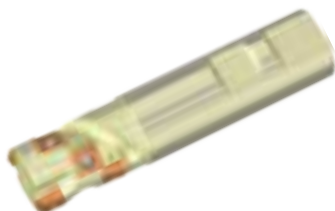


Slot milling



Side milling

EMP09 **P** **M** **K** **S**



Specification of tools

Type	Stock	Basic dimensions(mm)					Number of teeth Z	Number of inserts	Weight (kg)
		ØD	ød	L	L1	e			
EMP09 -025×30-XP25-LN08-02C	▲	25	25	100	40	30	2	8	0.31
-032×38-XP32-LN08-03C	▲	32	32	115	45	38	3	15	0.62
-040×45-XP32-LN08-04C	▲	40	32	120	55	45	4	24	0.7
-040×33-XP32-LN12-02C	▲	40	32	115	45	33	2	6	0.7
-040×43-XP32-LN12-02C	▲	40	32	125	55	43	2	8	0.7
-050×43-XP40-LN12-03C	▲	50	40	135	55	43	3	12	1.4
-050×53-XP40-LN12-03C	▲	50	40	145	65	53	3	15	1.5

▲ Stock available

△ Make-to-order

Indexable
milling tools

Square shoulder milling tools

Spare parts

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

Tools code key

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Square shoulder milling tools

Kr:90°



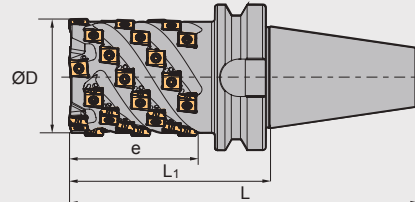
Step shoulder



Slot milling



Side milling

EMP09 P M K S

Specification of tools

Type	Stock	Basic dimensions(mm)				Number of teeth Z	Shank type	Number of inserts	Weight (kg)
		ØD	e	L1	L				
EMP09 -050×63-BT50-LN12-03C	△	50	63	124	225.8	3	BT	18	4.34
-050×85-BT50-LN12-03C	△	50	85	146	246.8	3	BT	24	4.57
-050×103-BT50-LN12-03C	△	50	103	164	265.8	3	BT	30	4.89
-063×85-BT50-LN12-04C	△	63	85	146	246.8	4	BT	32	5.35
-063×115-BT50-LN12-04C	△	63	115	176	277.8	4	BT	44	6.07
-080×125-BT50-LN12-05C	△	80	125	186	287.8	5	BT	60	8.25

▲Stock available

△Make-to-order

Indexable
milling tools

Square shoulder milling tools

Spare parts

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

Tools code key
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MILLING

Indexable Milling Tools

Square shoulder milling tools

Kr:90°



Step shoulder

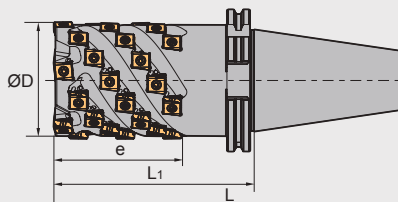


Slot milling



Side milling

EMP09 **P** **M** **K** **S**



Specification of tools

Type	Stock	Basic dimensions(mm)				Number of teeth Z	Shank type	Number of inserts	Weight (kg)
		ØD	e	L1	L				
EMP09 -050×103-JT50-LN12-03C	△	50	103	164	265.75	3	JT	30	5.11
-063×85-JT50-LN12-04C	△	63	85	146	246.75	4	JT	32	4.34
-063×115-JT50-LN12-04C	△	63	115	176	277.75	4	JT	44	5.46
-080×125-JT50-LN12-05C	△	80	125	186	287.75	5	JT	60	7.82

▲ Stock available

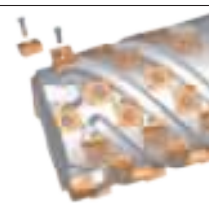
△ Make-to-order

Indexable
milling tools

Square shoulder milling tools

Spare parts

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



Tools code key

B24-B25

Grade selection guide

B19-B23

Technical data

B234-B240

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

[illegible][illegible]

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

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

Case for EMP09

Indexable
milling tools

Square shoulder milling tools

● Ultra-long working life

The material of workpiece: 45[#]

Hardness: 175-190 (HB)

Machine tool: Planer-type milling machine

Type of cooling: No cooling

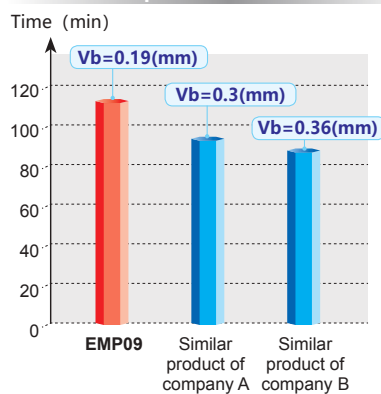
The machining type: Shoulder milling

Toolholder: EMP09-050-A22-LN12-05C

Insert: LNKT120608PNR-GM/YB9320

Cutting parameter: $V_c=260\text{m/min}$, $A_p=8\text{mm}$, $A_e=2\text{mm}$, $f_z=0.2\text{mm/z}$

Comparison of tool life



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

● Better surface quality

The material of workpiece: NAK80

Hardness: HRC(33-37)

Machine tool: Planer-type milling machine

Type of cooling: No cooling

The machining type: Shoulder milling

Toolholder: EMP09-050-A22-LN12-05C

Insert: LNKT120608PNR-GM (YB9320)

Similar product of company A

Cutting parameter: $V_c=240\text{m/min}$, $A_p=8\text{mm}$

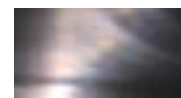
$A_e=2\text{mm}$, $f_z=0.2\text{mm/z}$

EMP09



No obvious gear mark

Similar product of company A



Slight step

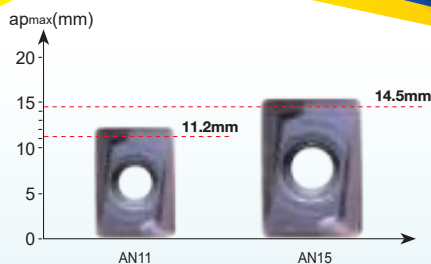
Result: EMP09 series of tangential milling cutter has higher precision and better surface quality, no obvious gear mark, and runout value, which is better than the similar product of company A.

Kr:90°

**Achieving high
quality 90° square
shoulder milling**

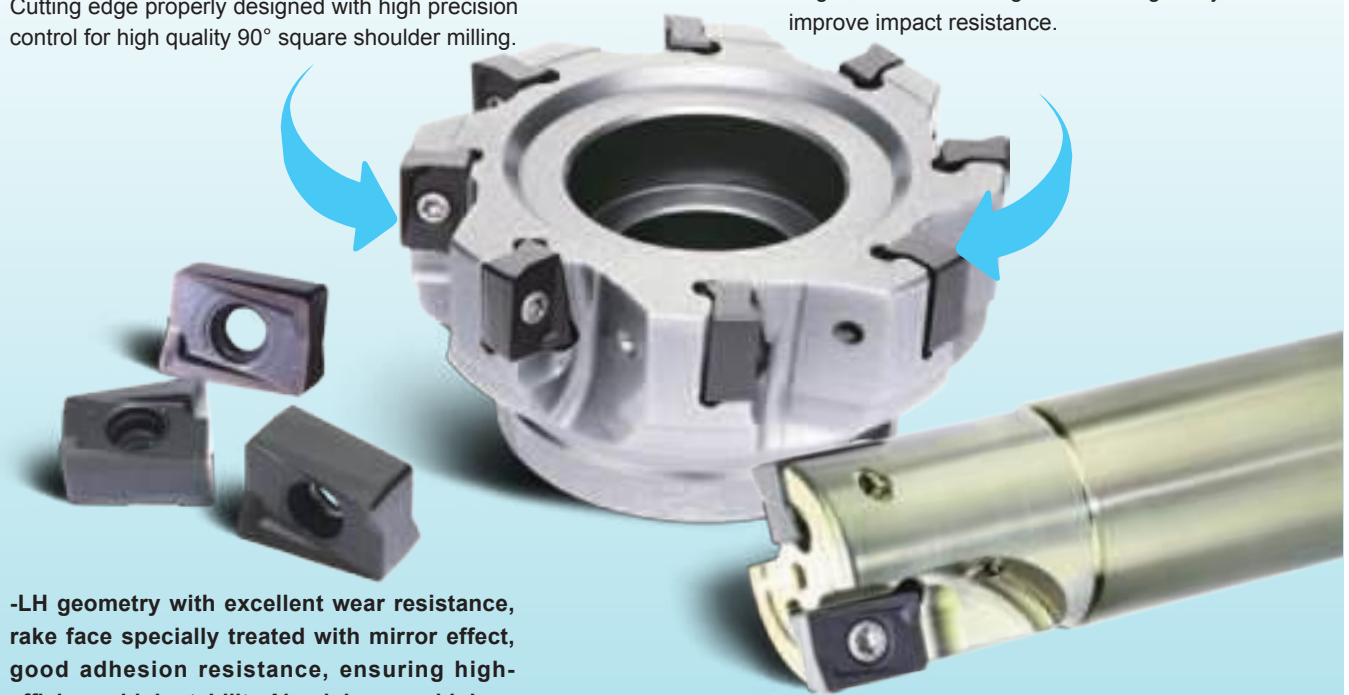
EMP13

**Series Square
Shoulder Milling Tools**



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

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



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



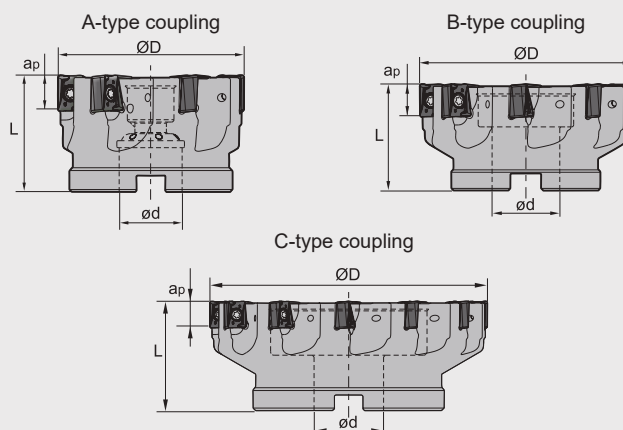
B MILLING

Indexable Milling Tools

Square shoulder milling tools Kr:90°



EMP13 P M K N S



Specification of tools

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

▲Stock available △Make-to-order

Spare parts

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

Tools code key
B24-B25

Grade selection guide
B19-B23

Technical data
B234-B240

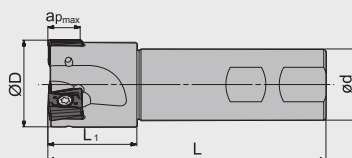
Square shoulder milling tools **Kr:90°****EMP13** P M K N S

Straight shank

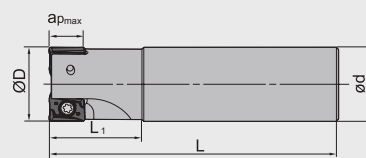


Weldon shank

Weldon shank



Straight shank



Specification of tools

Type		Stock	Basic dimensions(mm)					Number of flute Z	Weight (kg)
			ØD	ød	L	L ₁	apmax		
EMP13 Weldon shank	-025-XP25-AN11-02C	▲	25	25	100	32	11.2	2	0.31
	-032-XP32-AN11-03C	▲	32	32	115	40	11.2	3	0.61
	-040-XP32-AN11-04C	▲	40	32	125	40	11.2	4	0.75
	-032-XP32-AN15-02C	▲	32	32	125	40	14.5	2	0.66
	-040-XP32-AN15-03C	▲	40	32	125	40	14.5	3	0.76
Straight shank	-025-G25-AN11-02C	▲	25	25	100	32	11.2	2	0.31
	-032-G32-AN11-03C	▲	32	32	115	40	11.2	3	0.61
	-040-G32-AN11-04C	▲	40	32	125	40	11.2	4	0.75
	-032-G32-AN15-02C	▲	32	32	125	40	14.5	2	0.66
	-040-G32-AN15-03C	▲	40	32	125	40	14.5	3	0.76

▲ Stock available

△ Make-to-order

Spare parts

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

Tools code key
B24-B25Grade selection guide
B19-B23Technical data
B234-B240Indexable
milling tools

Square shoulder milling tools



B MILLING

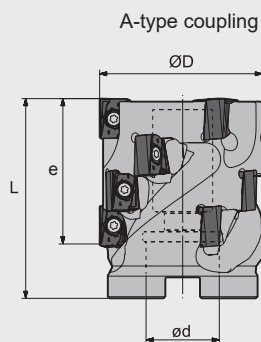
Indexable Milling Tools

Square shoulder milling tools

Kr:90°



EMP13 **P** **M** **K** **N** **S**



Specification of tools

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

▲ Stock available

△ Make-to-order

Spare parts

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

Tools code key
B24-B25

Grade selection guide
B19-B23

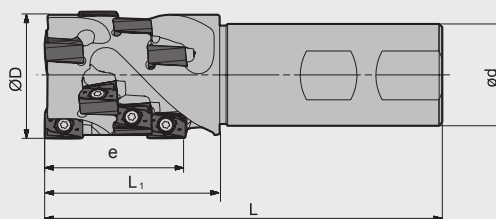
Technical data
B234-B240

Square shoulder milling tools

Kr:90°

**EMP13** P M K N S

Weldon shank



Specification of tools

Type	Stock	Basic dimensions(mm)					Number of teeth Z	Number of inserts	Weight (kg)
		ØD	ød	L	L ₁	e			
EMP13 -032×43-XP32-AN11-02	▲	32	32	115	48	43	2	8	0.61
-040×43-XP32-AN11-03	▲	40	32	125	55	43	3	12	0.79
-040×40-XP32-AN15-02	▲	40	32	115	55	40	2	6	0.79
-050×53-XP40-AN15-02	▲	50	40	145	70	53	2	8	1.53

▲ Stock available

△ Make-to-order

Indexable
milling tools

Square shoulder milling tools

Spare parts

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

Tools code key
B24-B25Grade selection guide
B19-B23Technical data
B234-B240

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

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

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

B 140



MILLING

Indexable Milling Tools

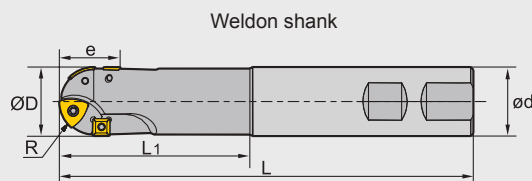
Indexable
milling tools

Profile milling tools

Profile milling tools



BMR01 P M K



Specification of tools

Type	Stock	Basic dimensions(mm)						Applicable inserts				Weight (kg)
		R	ØD	e	ød	L	L1	Type	Quantity	Type	Quantity	
BMR01 -020-XP20-S	▲	10	20	20	20	125	50	ZDET08T2CYR10	2	SPMT060304	2	0.3
-020-XP20-M	▲	10	20	20	20	150	75	ZDET08T2CYR10	2	SPMT060304	2	0.3
-020-XP20-L	▲	10	20	20	20	200	100	ZDET08T2CYR10	2	SPMT060304	2	0.4
-025-XP25-S	▲	12.5	25	23	25	150	70	ZDET1103CYR12.5	2	SPMT060304	2	0.5
-025-XP25-M	▲	12.5	25	23	25	175	95	ZDET1103CYR12.5	2	SPMT060304	2	0.6
-025-XP25-L	▲	12.5	25	23	25	200	100	ZDET1103CYR12.5	2	SPMT060304	2	0.7
-032-XP32-S	▲	16	32	31	32	175	85	ZDET13T3CYR16	2	SDMT090308	2	0.9
-032-XP32-M	▲	16	32	31	32	200	100	ZDET13T3CYR16	2	SDMT090308	2	1.1
-032-XP32-L	▲	16	32	31	32	250	150	ZDET13T3CYR16	2	SDMT090308	2	1.4
-040-XP40-S	▲	20	40	41	40	175	85	ZPNT2204CY(R20)	3	SPMT120408	2	1.4
-040-XP40-M	▲	20	40	41	40	200	100	ZPNT2204CY(R20)	3	SPMT120408	2	1.7
-040-XP40-L	▲	20	40	41	40	250	150	ZPNT2204CY(R20)	3	SPMT120408	2	2.1
-050-XP40-S	▲	25	50	45	40	200	100	ZPNT2204CY(R25)	3	SPMT120408	2	1.8
-050-XP40-M	▲	25	50	45	40	300	100	ZPNT2204CY(R25)	3	SPMT120408	2	2.8
-063-XP40-S	▲	31.5	63	52	40	200	100	ZPNT2204CY(R31)	4	SPMT120408	2	3.0
-063-XP40-M	▲	31.5	63	52	40	300	100	ZPNT2204CY(R31)	4	SPMT120408	2	3.5

▲Stock available

△Make-to-order

Spare parts

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

Tools code key
B24-B25Grade selection guide
B19-B23Technical data
B234-B240Indexable
milling tools

Profile milling tools

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

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

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

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

Profile milling tools



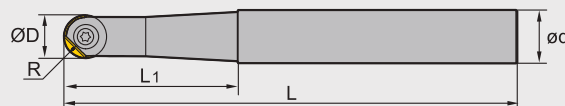
Profile



Side milling(R)



Slot milling

BMR02 P M K

➤ Specification of tools

Type	Stock	Basic dimensions(mm)					Weight (kg)
		R	ØD	ød	L	L ₁	
BMR02 -012-G16-S	▲	6	12	16	110	40	0.1
-012-G16-M	▲	6	12	16	130	50	0.2
-012-G16-L	▲	6	12	16	160	50	0.2
-016-G20-S	▲	8	16	20	140	45	0.3
-016-G20-M	▲	8	16	20	170	65	0.3
-016-G20-L	▲	8	16	20	200	65	0.4
-020-G25-S	▲	10	20	25	160	60	0.5
-020-G25-M	▲	10	20	25	200	80	0.6
-020-G25-L	▲	10	20	25	240	80	0.8

▲ Stock available

△ Make-to-order

Indexable
milling tools

Profile milling tools

➤ Spare parts

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

Tools code key
B24-B25Grade selection guide
B19-B23Technical data
B234-B240

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

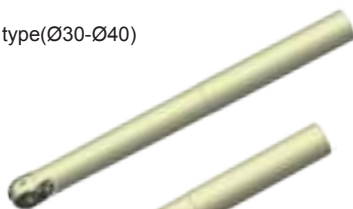
★ Recommended grade (always stock available) ● Available grade (always stock available) ○ Make-to-order

B 144

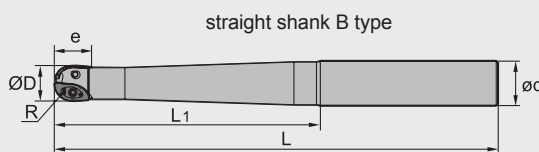
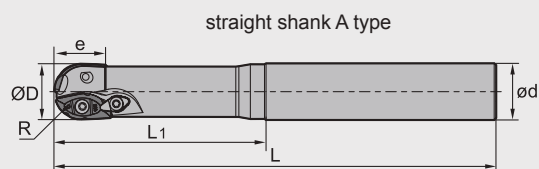
Profile milling tools

**BMR03** P M K

A type(Ø30-Ø40)



B type(Ø16-Ø25)



Specification of tools

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

▲Stock available

△Make-to-order

Tools code key
B24-B25Grade selection guide
B19-B23Technical data
B234-B240Indexable
milling tools

Profile milling tools

Profile milling tools

BMR03

P

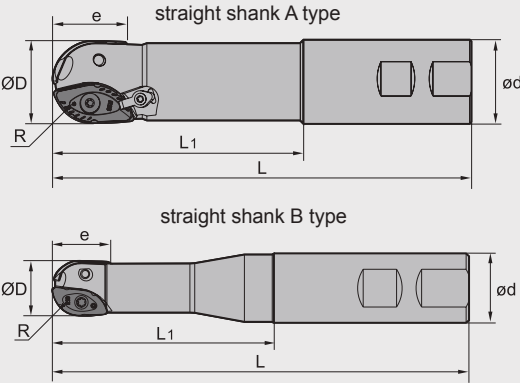
M

K

A type(Ø30-Ø50)



B type(Ø16-Ø25)



Specification of tools

Type	Stock	Basic dimensions(mm)						Number of teeth Z	Weight (kg)	Type	Clamp
		R	ØD	ød	L	L1	e				
BMR03 -016-XP20-M	▲	8	16	20	111	60	16	2	0.2	B	--
-020-XP25-M	▲	10	20	25	127	70	20	2	0.3	B	
-020-XP25-L	▲	10	20	25	150	80	20	2	0.4	B	
-025-XP25-M	▲	12.5	25	25	137	80	25	2	0.4	B	
-025-XP25-L	▲	12.5	25	25	200	100	25	2	0.6	B	
-030-XP32-M	▲	15	30	32	161	100	30	2	0.8	A	WD-208
-030-XP32-L	▲	15	30	32	250	150	30	2	1.3	A	
-032-XP32-M	▲	16	32	32	161	100	32	2	0.8	A	
-032-XP32-L	▲	16	32	32	250	120	32	2	1.3	A	
-040-XP40-M	▲	20	40	40	175	100	40	2	1.3	A	CBH5R1
-040-XP40-L	▲	20	40	40	250	120	40	2	2.0	A	
-050-XP50-M	▲	25	50	50	200	100	50	2	2.5	A	
-050-XP50-L	▲	25	50	50	250	150	50	2	3.1	A	

▲Stock available

△Make-to-order

Tools code key

B24-B25

Grade selection guide

B19-B23

Technical data

B234-B240

Profile milling tools

**BMR03** P M K

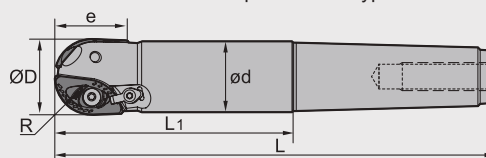
A type(Ø30-Ø50)



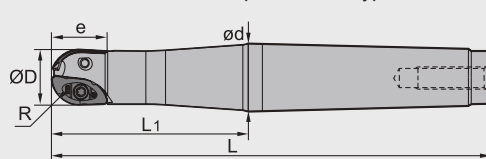
B type(Ø20-Ø25)



Morse taper shank A type



Morse taper shank B type



Specification of tools

Type	Stock	Basic dimensions(mm)						Number of teeth Z	Weight (kg)	Type	Clamp
		R	ØD	ød	L	L1	e				
BMR03 -020-MT3-M	▲	10	20	18.7	156	70	20	2	0.4	B	--
-020-MT3-L	△	10	20	18.7	186	100	20	2	0.4	B	
-025-MT3-M	▲	12.5	25	23.5	156	70	25	2	0.4	B	
-025-MT3-L	△	12.5	25	23.5	186	100	25	2	0.4	B	
-030-MT4-M	▲	15	30	28.2	189	70	30	2	0.8	A	WD-208
-030-MT4-L	△	15	30	28.2	229	120	30	2	1.0	A	
-032-MT4-M	▲	16	32	29.2	179	70	32	2	0.9	A	
-032-MT4-L	△	16	32	29.2	209	100	32	2	0.9	A	
-040-MT4-M	▲	20	40	36.9	199	100	40	2	1.0	A	CBH5R1
-040-MT5-L	▲	20	40	36.9	226	90	40	2	1.8	A	
-040-MT5-XL	▲	20	40	36.9	256	120	40	2	2.0	A	
-050-MT5-M	▲	25	50	46.8	236	100	50	2	2.2	A	
-050-MT5-L	▲	25	50	46.8	286	150	50	2	2.9	A	

▲ Stock available

△ Make-to-order

Indexable milling tools

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Profile milling tools

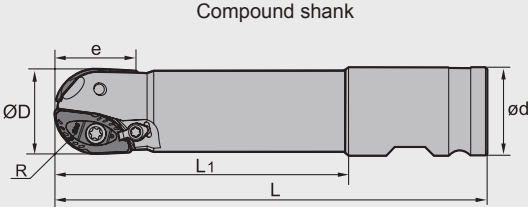


BMR03

P

M

K



Specification of tools

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

▲Stock available

△Make-to-order

Spare parts

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

Workpiece material	Good working condition				Normal working condition				Bad working condition			
	1	2	3	4	1	2	3	4	1	2	3	4
P Steel	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊
M Stainless steel	😊	😊	😊	😊					😊	😊	😊	😊
K Cast iron					😞	😞	😞		😞	😞		
N Non-ferrous metal												😞
S Heat resistant alloy, Ti alloy					😊	😊	😊	😊		😞	😞	

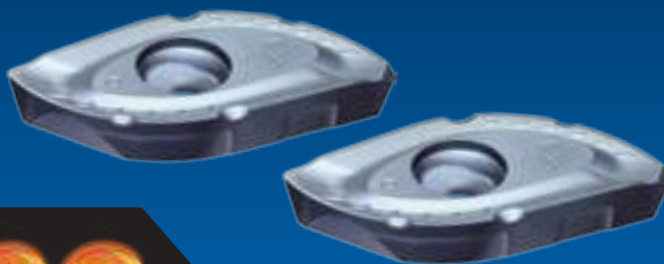
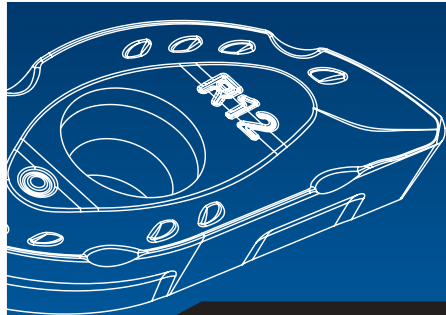
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Indexable milling tools

Profile milling tools

Technical data

B234-B240



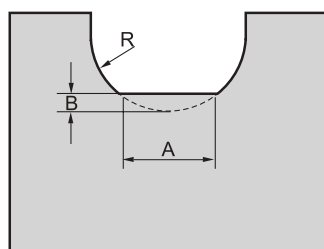
BMR03

series ball nose end milling tools

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



Slot shape after machining



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

Cautions:

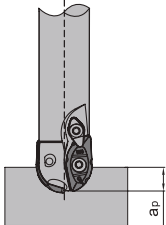
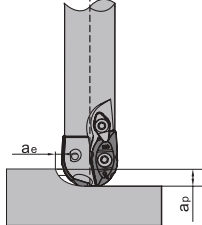
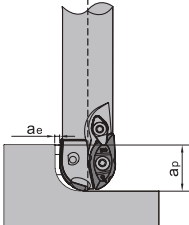
The insert edge should correspond to the locating face of insert pocket in the tool. Don't install the wrong side up.

Before screwing down the insert, confirm the good connection between insert and insert pocket.

Select and adjust the cutting parameters according to machine power and machining conditions.

If vibration occurs in the machining process, cutting speed should be reduced properly.

► Recommended cutting parameters **Diameter Ø16**

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

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

2. Wind cooling to be preferred.

Indexable
milling tools

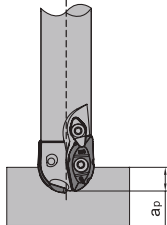
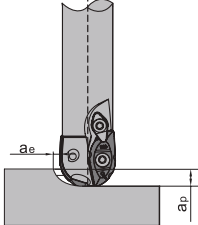
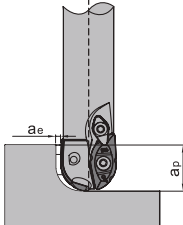
Profile milling tools



MILLING

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➤ Recommended cutting parameters Diameter Ø20

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

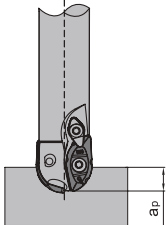
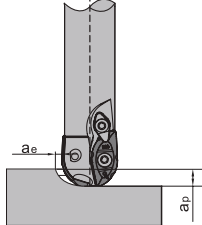
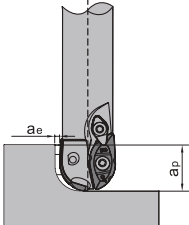
Note: 1. Parameters in the table shall be adjusted according to the rigidity of the machine or workpiece.

2. Wind cooling to be preferred.

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Profile milling tools

► Recommended cutting parameters **Diameter Ø25**

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

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

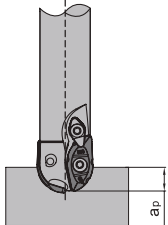
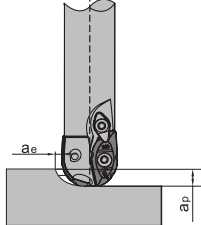
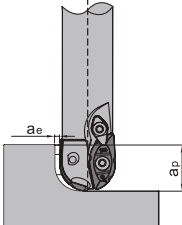
2. Wind cooling to be preferred.

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milling tools

Profile milling tools



➤ Recommended cutting parameters Diameter Ø30, Ø32

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

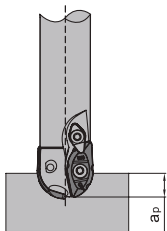
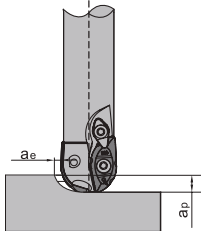
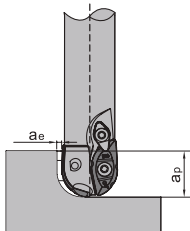
Note: 1. Parameters in the table shall be adjusted according to the rigidity of the machine or workpiece.

2. Wind cooling to be preferred.

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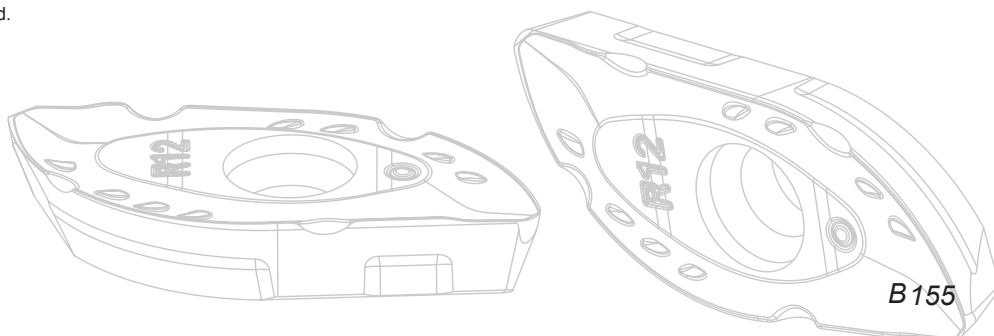
Profile milling tools

➤ Recommended cutting parameters **Diameter Ø40**

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

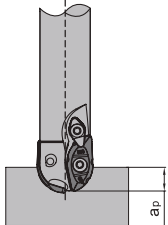
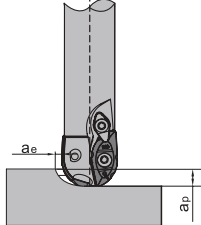
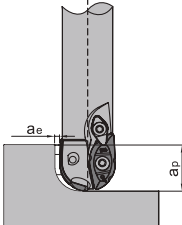
Note: 1. Parameters in the table shall be adjusted according to the rigidity of the machine or workpiece.

2. Wind cooling to be preferred.





➤ Recommended cutting parameters Diameter Ø50

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

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

2. Wind cooling to be preferred.

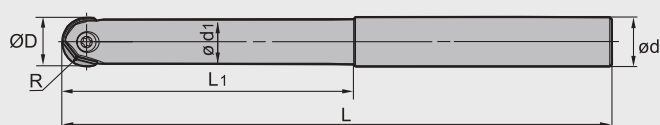
Indexable
milling tools

Profile milling tools

Profile milling tools

**BMR04** P M K

Straight shank with straight neck



➤ Specification of tools

Type	Stock	Basic dimensions(mm)						Weight (kg)
		R	ØD	ød	ød ₁	L ₁	L	
BMR04 -012-G12-M	▲	6	12	12	11	35	125	0.1
-012-G12-L	△	6	12	12	11	45	150	0.1
-016-G16-M	▲	8	16	16	14	40	150	0.2
-016-G16-L	△	8	16	16	14	55	180	0.3
-020-G20-M	▲	10	20	20	18	65	180	0.4
-020-G20-L	△	10	20	20	18	100	250	0.6
-025-G25-M	▲	12.5	25	25	23	70	200	0.7
-025-G25-L	△	12.5	25	25	23	100	250	0.9
-030-G32-M	▲	15	30	32	27	130	250	1.2
-030-G32-L	△	15	30	32	27	150	300	1.5
-032-G32-M	▲	16	32	32	29	80	250	1.4
-032-G32-L	△	16	32	32	29	109	300	1.7

▲ Stock available

△ Make-to-order

Indexable
milling tools

Profile milling tools

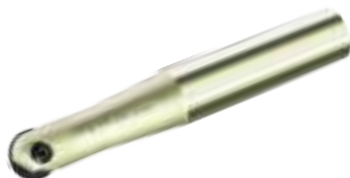
Tools code key
B24-B25Grade selection guide
B19-B23Technical data
B234-B240



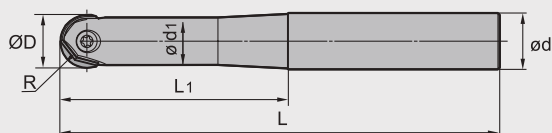
Profile milling tools



BMR04 P M K



Straight shank with taper neck



Specification of tools

Type	Stock	Basic dimensions(mm)						Weight (kg)
		R	ØD	Ød	Ød ₁	L ₁	L	
BMR04 -012-G16-M	▲	6	12	16	11	50	125	0.2
-012-G16-L	△	6	12	16	11	60	150	0.2
-016-G20-M	▲	8	16	20	14	60	150	0.3
-016-G20-L	△	8	16	20	14	80	180	0.3
-020-G25-M	▲	10	20	25	18	75	180	0.6
-020-G25-L	△	10	20	25	18	85	200	0.6
-025-G32-M	▲	12.5	25	32	23	90	200	1.0
-025-G32-L	△	12.5	25	32	23	110	250	1.3
-030-G40-M	▲	15	30	40	27	110	250	2.0
-030-G40-L	△	15	30	40	27	125	300	2.4
-032-G40-M	▲	16	32	40	29	110	250	2.0
-032-G40-L	△	16	32	40	29	125	300	2.4

▲ Stock available △ Make-to-order

Tools code key
B24-B25

Grade selection guide
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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

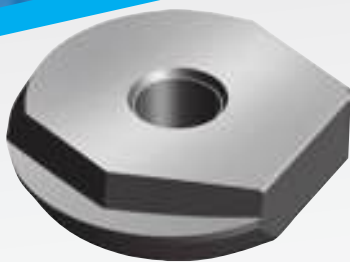
Profile milling tools



BMR04

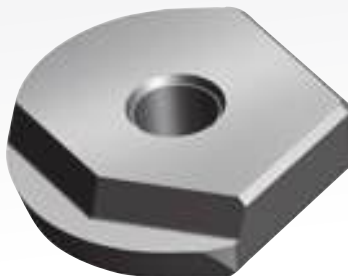
Series ball nose finishing end
milling tools

-GF



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

-GM



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

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

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

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

$$N = \frac{1000 V_c}{\pi D c} (r/min)$$

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

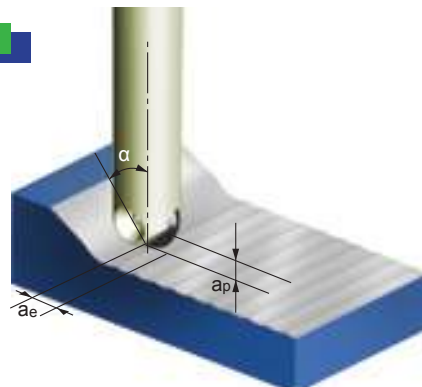
N: rotating speed

Vc: actual cutting speed

Dc: effective cutting diameter

D: tool nominal diameter

a_p: axial cutting depth



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

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

➤ Recommended cutting parameters

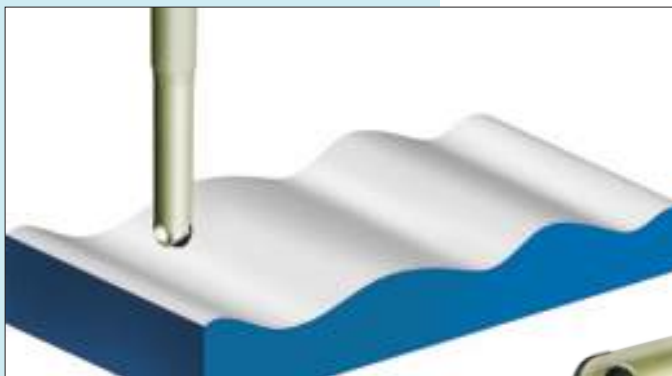
Workpiece material		Hardness HB	Insert grade	Cutting parameters	Tool specification					
					Ø12	Ø16	Ø20	Ø25	Ø30	Ø32
P	Carbon steel	HB ≤ 180	YBG252	Vc(m/min)	100~200	100~200	100~200	100~200	100~200	100~200
				fz(mm/z)	0.15~0.25	0.2~0.3	0.2~0.3	0.25~0.35	0.25~0.35	0.25~0.35
				apmax(mm)	0.8	1.0	1.25	1.5	2.0	2.0
				aemax(mm)	0.8	1.0	1.25	1.5	2.0	2.0
	Alloy steel	HB180~280		Vc(m/min)	80~180	80~180	80~180	80~180	80~180	80~180
				fz(mm/z)	0.15~0.25	0.2~0.3	0.2~0.3	0.25~0.35	0.25~0.35	0.25~0.35
				apmax(mm)	0.8	1.0	1.25	1.5	2.0	2.0
				aemax(mm)	0.8	1.0	1.25	1.5	2.0	2.0
	Hardened steel	HRC55~65		Vc(m/min)	60~100	60~100	60~100	60~100	60~100	60~100
				fz(mm/z)	0.15~0.25	0.2~0.3	0.2~0.3	0.25~0.35	0.25~0.35	0.25~0.35
				apmax(mm)	0.4	0.5	0.6	0.8	1.0	1.0
				aemax(mm)	0.4	0.5	0.6	0.8	1.0	1.0
M	Stainless steel	HB ≤ 270	Vc(m/min)	70~150	70~150	70~150	70~150	70~150	70~150	
			fz(mm/z)	0.1~0.2	0.1~0.25	0.1~0.25	0.2~0.3	0.2~0.3	0.2~0.3	
			apmax(mm)	0.6	0.8	1.0	1.25	1.5	1.5	
			aemax(mm)	0.6	0.8	1.0	1.25	1.5	1.5	
K	Cast iron	HB180~250	Vc(m/min)	160~300	160~300	160~300	160~300	160~300	160~300	
			fz(mm/z)	0.2~0.3	0.25~0.35	0.25~0.35	0.3~0.4	0.3~0.4	0.3~0.4	
			apmax(mm)	1.0	1.5	1.8	2.0	2.5	2.5	
			aemax(mm)	1.0	1.5	1.8	2.0	2.5	2.5	



MILLING

Indexable Milling Tools

Case for BMR04



Workpiece material: 42CrMo (HRC35)
Cooling system: Dry cutting
Machine: Vertical machining center
Cutting parameters:
 $V_c=150\text{m/min}$
 $a_p=0.1\text{mm}$
 $f_z=0.2\text{mm/Z}$

Tool type: BMR04-020-G25-M

Insert type/grade: ZOHX2005-GM/YBG252

● Abrasion comparison of inserts after milling curved face

ZCC-CT

Other company product

After 60 minutes
of cutting



Abrasion on the
clearance face 0.08



Abrasion on the
clearance face 0.10

After 120 minutes
of cutting



Abrasion on the
clearance face 0.12



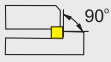
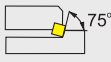
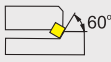
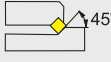
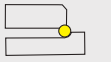
Abrasion on the
clearance face 0.16

Indexable
milling tools

Profile milling tools

Side and face milling tools code key

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

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

Sequence number of series

Cutting diameter ØD (mm)

Cutting width of milling tools

Coupling structure and demension

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

Indexable
milling tools

Side and face milling tools

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



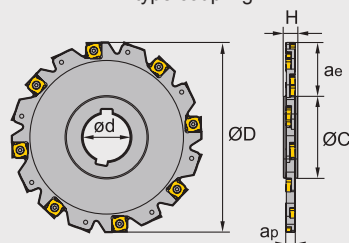
Side and face milling tools



SMP01 P M K



K-type coupling



Specification of tools

Type	Stock	Basic dimensions(mm)						Applicable inserts	Number of teeth Z	Type of coupling	Weight (kg)
		ØD	Ød	Øc	H	ap	aemax				
SMP01 Mounting by keyway	-100×4-K27-SN12-10	△	100	27	45	12	4	25	XSEQ1202	K	0.2
	-125×4-K40-SN12-12	△	125	40	56	12	4	32		K	0.3
	-160×4-K40-SN12-16	△	160	40	67	12	4	44		K	0.5
	-100×5-K27-SN12-10	△	100	27	45	12	5	25	XSEQ1203	K	0.2
	-125×5-K40-SN12-12	△	125	40	56	12	5	32		K	0.3
	-160×5-K40-SN12-16	△	160	40	67	12	5	44		K	0.6
	-100×6-K27-SN12-10	△	100	27	45	12	6	25	XSEQ12T3	K	0.3
	-125×6-K40-SN12-12	△	125	40	56	12	6	32		K	0.4
	-160×6-K40-SN12-16	△	160	40	67	12	6	44		K	0.7
	-200×6-K50-SN12-18	△	200	50	71	12	6	62	XSEQ1204	K	1.1
	-250×6-K50-SN12-24	△	250	50	71	12	6	87		K	1.7
	-100×7-K27-SN12-10	△	100	27	45	12	7	25	XSEQ1204	K	0.3
	-125×7-K40-SN12-12	△	125	40	56	12	7	32		K	0.4
	-160×7-K40-SN12-16	△	160	40	67	12	7	44		K	0.8
	-200×7-K50-SN12-18	△	200	50	71	12	7	62	XSEQ12T4	K	1.2
	-250×7-K50-SN12-24	△	250	50	71	12	7	87		K	1.9
	-100×8-K27-SN12-10	△	100	27	45	12	8	25	XSEQ12T4	K	0.3
	-125×8-K40-SN12-12	△	125	40	56	12	8	32		K	0.5
	-160×8-K40-SN12-16	△	160	40	67	12	8	44		K	0.9
	-200×8-K50-SN12-18	△	200	50	71	12	8	62		K	1.4
	-250×8-K50-SN12-24	△	250	50	71	12	8	87		K	2.2

▲ Stock available △ Make-to-order

Tools code key
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Grade selection guide
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Side and face milling tools

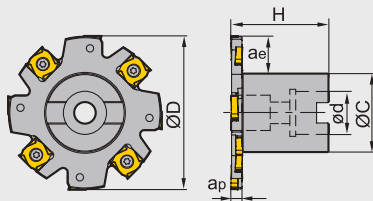


Machining of slot

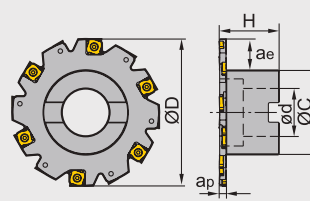
SMP01 P M K



A-type coupling



B-type coupling



Specification of tools

Type	Stock		Basic dimensions(mm)						Applicable inserts	Number of teeth Z	Type of coupling	Weight (kg)
	R	L	ØD	ød	øc	H	ap	aemax				
SMP01 Arbor mounting	△	△	63	22	32	40	4	14	XSEQ1202	6	A	0.2
	△	△	80	22	40	50	4	18		8	A	0.4
	△	△	100	27	48	50	4	23		10	A	0.6
	△	△	63	22	32	40	5	14	XSEQ1203	6	A	0.2
	△	△	80	22	40	50	5	18		8	A	0.4
	△	△	100	27	48	50	5	23		10	A	0.7
	△	△	63	22	32	40	6	14	XSEQ12T3	6	A	0.2
	△	△	80	22	40	50	6	18		8	A	0.5
	△	△	100	27	48	50	6	23		10	A	0.7
	△	△	125	32	70	50	6	30		12	B	1.0
	△	△	160	40	70	50	6	41	XSEQ1204	16	B	1.3
	△	△	63	22	32	40	7	14		6	A	0.2
	△	△	80	22	40	50	7	18		8	A	0.5
	△	△	100	27	48	50	7	23		10	A	0.7
	△	△	125	32	70	50	7	30	XSEQ12T4	12	B	1.1
	△	△	160	40	70	50	7	41		16	B	1.4
	△	△	63	22	32	40	8	14		6	A	0.2
	△	△	80	22	40	50	8	18		8	A	0.5
	△	△	100	27	48	50	8	23	XSEQ12T4	10	A	0.8
	△	△	125	32	70	50	8	30		12	B	1.1
	△	△	160	40	70	50	8	41		16	B	1.5

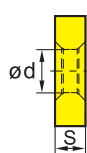
▲ Stock available

△ Make-to-order

Tools code key
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milling tools

Side and face milling tools

Selection of inserts



😊 Good working condition 😐 Normal working condition 😞 Bad working condition

[illegible][illegible]

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

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

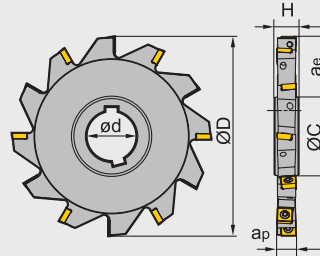
Side and face milling tools



SMP03 P M K



K-type coupling



Specification of tools

Type	Stock	Basic dimensions(mm)						Applicable inserts	Number of teeth Z	Type of coupling	Weight (kg)
		ØD	øc	ød	aemax	ap	H				
SMP03											
-080×8-K27-MP06-10	△	80	43	27	17	8	12	MPHT060304-DM	10	K	0.2
-100×8-K32-MP06-14	△	100	47	32	25	8	12		14	K	0.3
-100×10-K32-MP06-14	△	100	47	32	25	10	14		14	K	0.4
-125×10-K40-MP06-16	△	125	55	40	34	10	14		16	K	0.6
-125×12-K40-MP08-12	△	125	55	40	34	12	16	MPHT080305-DM	12	K	0.7
-160×12-K40-MP08-14	△	160	62	40	47	12	16		14	K	1.3
-160×16-K40-MP12-12	△	160	62	40	49	16	20	MPHT120408-DM	12	K	1.6
-160×18-K40-MP12-12	△	160	62	40	49	18	24		12	K	1.9
-160×20-K40-MP12-12	△	160	62	40	49	20	26		12	K	2.1
-200×16-K50-MP12-14	△	200	72	50	62	16	20		14	K	2.5
-200×18-K50-MP12-14	△	200	72	50	62	18	24		14	K	2.9
-200×20-K50-MP12-14	△	200	72	50	62	20	26		14	K	3.3

▲ Stock available

△ Make-to-order

Indexable milling tools

Side and face milling tools

Spare parts

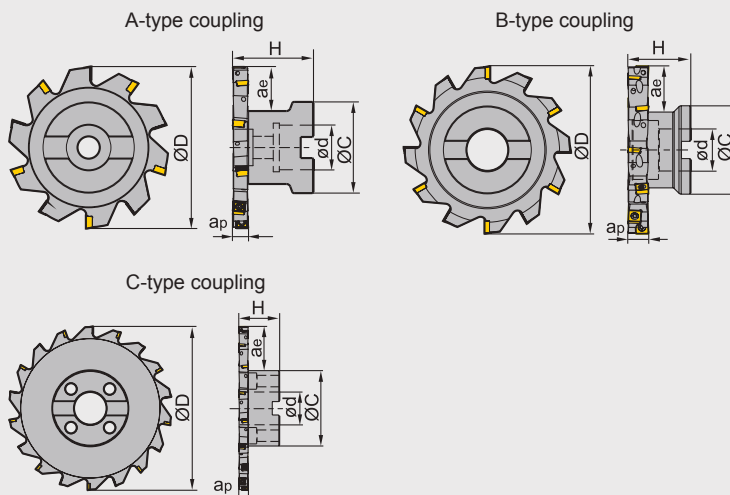
Diameter Ød	Inserts	Screw	Wrench	
				
Ø80-Ø125	MP06	I60M2.5x6.5	WT07IP	--
Ø125-Ø160	MP08	I60M3x7	WT09IP	--
Ø160-Ø200	MP12	I60M5x13	--	WT20IS

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Side and face milling tools



SMP03 P M K



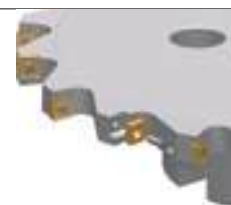
Specification of tools

Type	Stock		Basic dimensions(mm)						Applicable inserts	Number of teeth Z	Type of coupling	Weight (kg)
	R	L	ØD	øc	ød	ae max	ap	H				
SMP03 Arbor mounting	△	△	80	45	22	21	8	40	MPHT060304-DM	10	A	0.4
	△	△	100	55	27	24	8	40		14	B	0.6
	△	△	100	55	27	24	10	40		14	B	0.7
	△	△	125	65	32	33	10	45		16	B	1.1
	△	△	125	65	32	33	12	45	MPHT080305-DM	12	B	1.4
	△	△	160	80	40	45	12	50		14	B	1.9
	△	△	200	92	40	53	12	50		18	C	3.2
	△	△	125	65	32	33	16	50	MPHT120408-DM	10	B	2.3
	△	△	160	80	40	45	16	60		12	B	2.3
	△	△	160	80	40	45	18	60		12	B	2.4
	△	△	200	92	40	53	16	50		14	C	3.6
	△	△	200	92	40	53	18	50		14	C	3.9
	△	△	200	92	40	53	20	50		14	C	4.2

▲ Stock available △ Make-to-order

Spare parts

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



Tools code key
B24-B25

Grade selection guide
B19-B23

Technical data
B234-B240

Selection of inserts

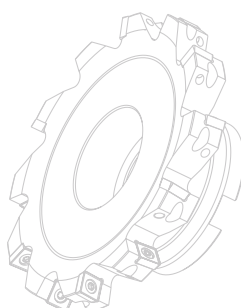
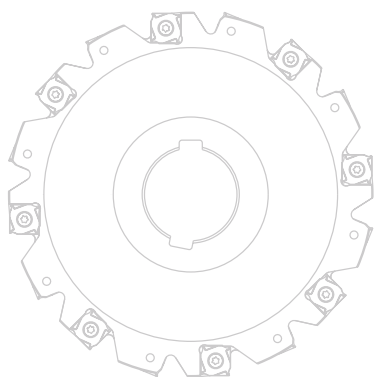
Selection of inserts

😊 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																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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Recommended cutting parameters

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



SMP05 Slot milling

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

Slot milling specification code

Slot milling

Weldon shank

Insert

Teeth

SMP05 - 039×3.0 - XP 25 - QC 16- 03

Minimum machining diameter(mm)

Code	Diameter
25	25
39	39
44	44

Maximum cutting width(mm)

Code	Cutting width
3.0	3.0
4.8	4.8

Cutter diameter(mm)

Code	Diameter
25	25
32	32

Cutting edge length code

16	9.525
22	12.70

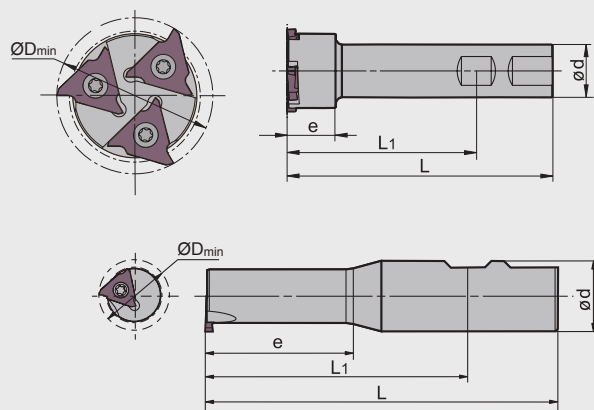
Inscribed circuler(mm)

Side and face milling tools



Machining of slot

SMP05 P M K

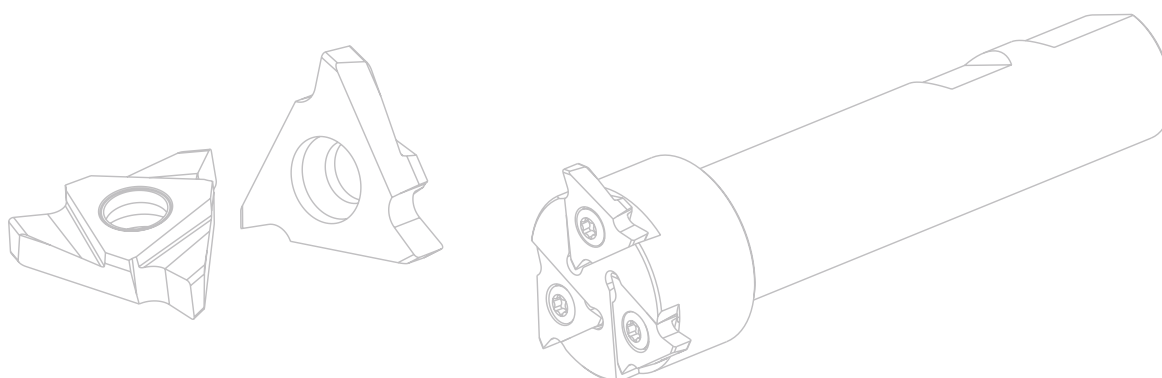


Specification of tools

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

▲Stock available

△Make-to-order



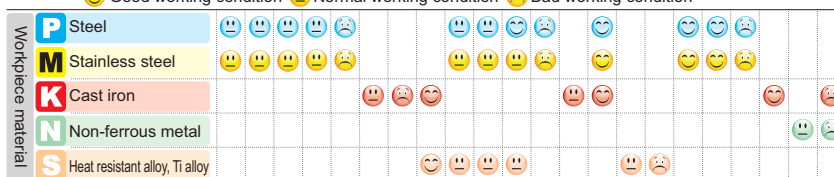
Spare parts

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

Tools code key
B24-B25Grade selection guide
B19-B23Technical data
B234-B240Indexable
milling tools

Side and face milling tools

😊 Good working condition 😐 Normal working condition 😞 Bad working condition



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

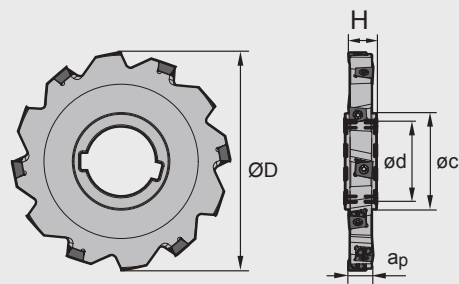
★ Recommended grade (always stock available) ● Available grade (always stock available) ○ Make-to-order

Side and face milling tools



Machining of slot

SMP09 P M K



K-type coupling

Specification of tools

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

▲ Stock available

△ Make-to-order

Tools code key
B24-B25Grade selection guide
B19-B23Technical data
B234-B240Indexable
milling tools

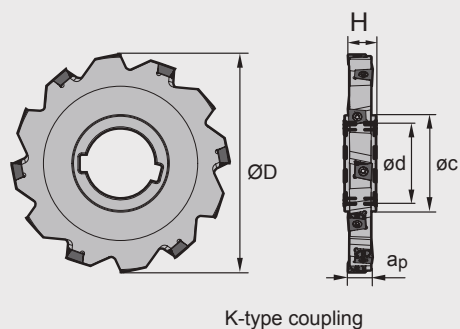
Side and face milling tools



Side and face milling tools



SMP09 P M K



Specification of tools

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

▲ Stock available

△ Make-to-order

Spare parts

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

Tools code key
B24-B25

Grade selection guide
B19-B23

Technical data
B234-B240

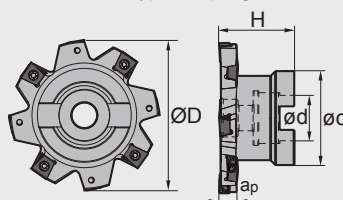
Side and face milling tools



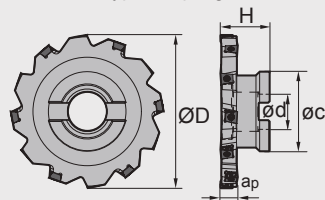
SMP09 P M K



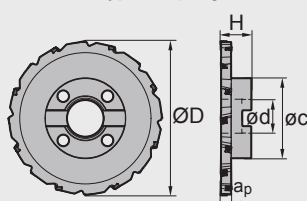
A-type coupling



B-type coupling



C-type coupling



Specification of tools

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

▲Stock available

△Make-to-order

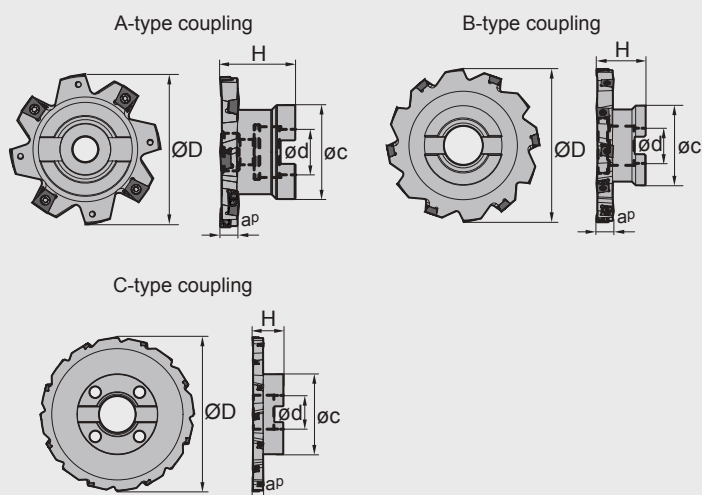
Indexable
milling tools

Side and face milling tools

Side and face milling tools



SMP09 P M K



Specification of tools

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

▲Stock available

△Make-to-order

Spare parts

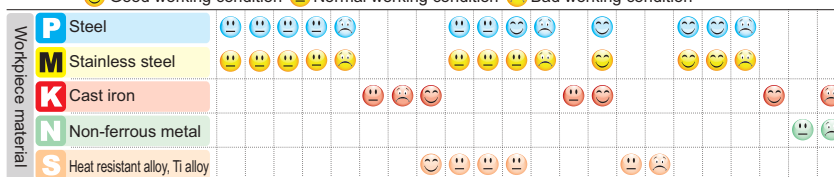
Diameter ØD	Edge width ap	Inserts	Screw	Wrench	
Ø80-Ø200	10	LNGX1005□□-GM	I60M3.5×8TT	WP10IS	
Ø100-Ø200	12	LNGX1407□□-GM	I60M4×10	WP15IS	
Ø100-Ø250	14-18	LNGX1005□□-GM	I60M3.5×8TT	WP10IS	
Ø125-Ø315	20-25	LNGX1407□□-GM	I60M4×12	WP15IS	

Tools code key
B24-B25

Grade selection guide
B19-B23

Technical data
B234-B240

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

[illegible]

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

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



B MILLING

Indexable Milling Tools

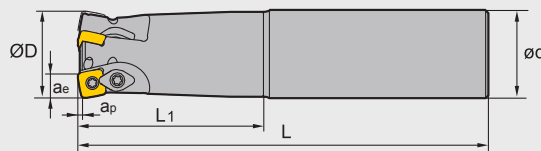
High feed milling cutters



XMR01 P M K S



S-type insert, straight shank



Specification of tools

Type	Stock	Basic dimensions(mm)						Number of teeth Z	Weight (kg)
		ØD	ap	ae	L1	L	ød		
XMR01 -020-G20-SD06-02	▲	20	0.8	4.45	50	130	20	2	0.26
-020-G20-SD06-02CL	△	20	0.8	4.45	100	180	20	2	0.364
-020-G20-SD06-02CXL	△	20	0.8	4.45	130	250	20	2	0.522
-025-G25-SD06-03	▲	25	0.8	4.45	60	140	25	3	0.46
-025-G25-SD06-03CL	△	25	0.8	4.45	120	200	25	3	0.670
-025-G25-SD06-03CXL	△	25	0.8	4.45	130	250	25	3	0.850
-025-G25-SD09-02	▲	25	1.4	6.88	60	140	25	2	0.5
-025-G25-SD09-02CL	△	25	1.4	6.88	120	200	25	2	0.636
-025-G25-SD09-02CXL	△	25	1.4	6.88	180	300	25	3	0.980
-032-G32-SD09-03	▲	32	1.4	6.88	90	150	32	3	0.8
-032-G32-SD09-03CL	△	32	1.4	6.88	120	200	32	3	1.006
-032-G32-SD09-03CXL	△	32	1.4	6.88	180	300	32	3	1.551
-035-G32-SD09-03	▲	35	1.4	6.88	70	150	32	3	0.8
-035-G32-SD09-03CL	△	35	1.4	6.88	120	200	32	3	1.037
-035-G32-SD09-03CXL	△	35	1.4	6.88	180	300	32	3	1.582
-032-G32-SD12-02	▲	32	1.8	8.77	90	150	32	2	0.8
-032-G32-SD12-02CL	△	32	1.8	8.77	120	200	32	2	1.002
-032-G32-SD12-02CXL	△	32	1.8	8.77	180	300	32	2	1.547
-040-G40-SD12-03	▲	40	1.8	8.77	70	150	40	3	1.3
-040-G40-SD12-03CL	△	40	1.8	8.77	70	250	40	3	2.118
-040-G40-SD12-03CXL	△	40	1.8	8.77	70	300	40	3	2.579
-040-G40-SD15-02	▲	40	2.2	11.7	70	200	40	2	1.6
-040-G40-SD15-02CL	△	40	2.2	11.7	70	250	40	2	2.061
-040-G40-SD15-02CXL	△	40	2.2	11.7	70	300	40	2	3.522

▲Stock available △Make-to-order

XMR01-020-G20-SD06QL-02CL/CXL

Standard toolholder sery — Long sery — Extended sery

Spare parts

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





Tools code key
B24-B25

Grade selection guide
B19-B23

Technical data
B234-B240

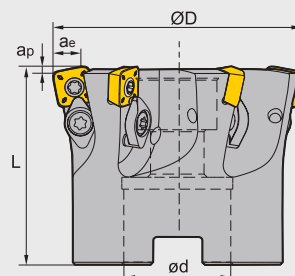
High feed milling cutters



XMR01 P M K S



S type insert milling cutter



Specification of tools

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

▲ Stock available

△ Make-to-order

Indexable milling tools

High feed milling cutters

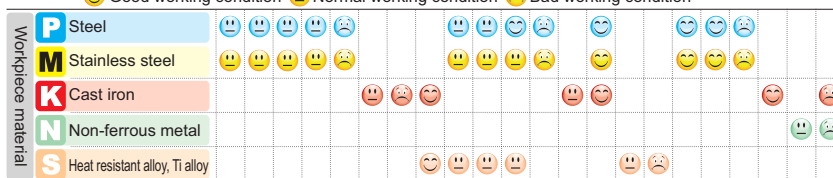
Spare parts

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



Tools code key
B24-B25Grade selection guide
B19-B23Technical data
B234-B240

😊 Good working condition 😐 Normal working condition 😞 Bad working condition



Insert shape	Type	Basic dimensions(mm)						CVD Coating						PVD Coating						Cermet	Cemented carbide								
		ØI.C	L	r	S	ød	α	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SDMT06T208-DM	6.35	6.35	0.8	2.58	2.5	15°	★			★						●	○				●							
	SDMT09T312-DM	9.525	9.525	1.2	3.97	4.0	15°	★			★						●	○											
	SDMT120412-DM	12.7	12.7	1.2	4.76	4.4	15°	★			★					★	●	○											
	SDMT150520-DM	15.875	15.875	2.0	5.56	5.5	15°	★			★						●	●	○										
	SDMT06T208-PM	6.35	6.35	0.8	2.58	2.5	15°	★		○						●						●							
	SDMT09T312-PM	9.525	9.525	1.2	3.97	4.0	15°	★		●						●													
	SDMT120412-PM	12.7	12.7	1.2	4.76	4.4	15°	★		●						●													
	SDMT150520-PM	15.875	15.875	2.0	5.56	5.5	15°	★		●						●													
	SDMT06T208-NM	6.35	6.35	0.8	2.58	2.5	15°				●											●							
	SDMT09T312-NM	9.525	9.525	1.2	3.97	4.0	15°				○											○	○						
	SDMT120412-NM	12.7	12.7	1.2	4.76	4.4	15°				○						○					○	○						
	SDMT150520-NM	15.875	15.875	2.0	5.56	5.5	15°				●						●					●							

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

-DM chipbreaker has blunt cutting edge and is relatively suitable for machining of hard materials such as hardened steel and cast iron, etc.

High feed milling cutters

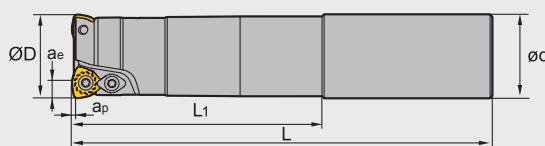
High feed milling cutters



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

△ Make-to-order

Indexable milling tools

High feed milling cutters

Spare parts

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

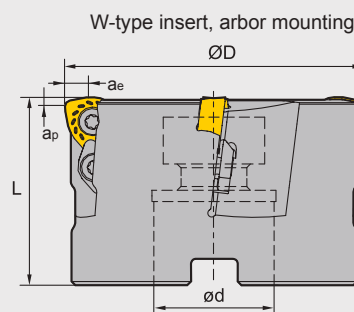


Tools code key
B24-B25Grade selection guide
B19-B23Technical data
B234-B240

High feed milling cutters



XMR01 P M K



Specification of tools

Type	Stock	Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
		ØD	ap	ae	L	ød			
XMR01 -050-A22-WP06-04	△	50	1.5	4.35	40	22	4	A	0.4
-050-A22-WP08-03	△	50	1.5	5.66	50	22	3	A	0.4
-063-A22-WP08-04C	△	63	1.5	5.66	50	22	4	A	0.7
-063-A27-WP08-04C	△	63	1.5	5.66	50	27	4	A	0.7
-080-A27-WP08-05C	△	80	1.5	5.66	63	27	5	A	1.5
-100-B32-WP08-06	△	100	1.5	5.66	63	32	6	B	2.2
-125-B40-WP08-07	△	125	1.5	5.66	63	40	7	B	3.5
-160-B40-WP08-08	△	160	1.5	5.66	63	40	8	B	6.0
-063-A22-WP09-03C	△	63	3.0	6.8	50	22	3	A	0.7
-080-A27-WP09-04C	△	80	3.0	6.8	63	27	4	A	1.4
-100-B32-WP09-05	△	100	3.0	6.8	63	32	5	B	2.1
-125-B40-WP09-06	△	125	3.0	6.8	63	40	6	B	3.7
-160-B40-WP09-07	△	160	3.0	6.8	63	40	7	B	6.3

▲Stock available △Make-to-order

Spare parts

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



Tools code key
B24-B25

Grade selection guide
B19-B23

Technical data
B234-B240

The technical drawing shows a triangular plate with a central circular hole. The outer vertices are labeled $\varnothing I.C$. The inner hole has a diameter $\varnothing d$. The distance from the center of the hole to the vertices is labeled r . A cross-section view on the right shows the plate has a thickness S and a fillet radius α at the top edge.

[illegible][illegible]

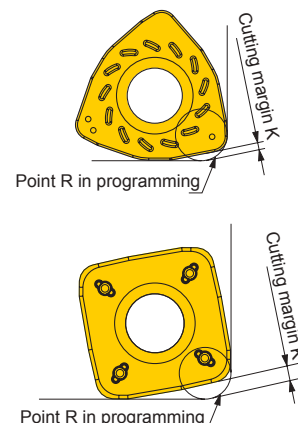
General chipbreaker has blunt cutting edge and is relatively suitable for machining of hard materials such as hardened steel and cast iron, etc.



MILLING / Indexable Milling Tools

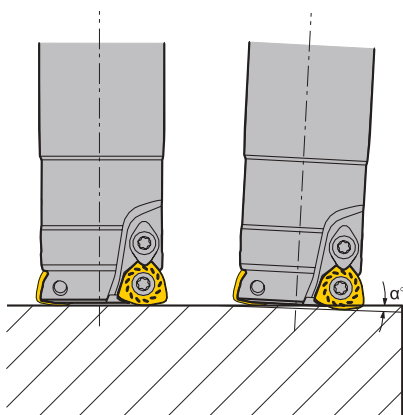
Approximate R in machining program

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

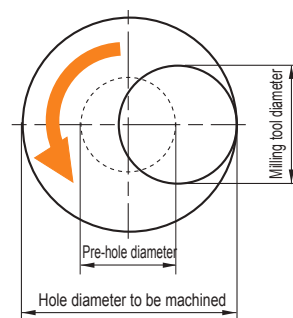


Different machining styles

■ Ramp machining



■ Helical interpolation milling



- Reduce the feed rate in ramp and helical machining operations.
- Set the axial feed rate below 0.2mm/rev in drilling operation.
- Be careful ! Long chips may fly off in drilling operation.
- The cutting depth of each rotation must not exceed the maximum cutting depth (a_p).
- The S-type insert can be used for plunge milling in addition to the machining operations mentioned above.

Selection guide for XMR01 series

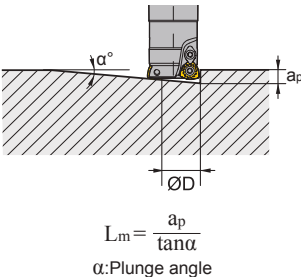
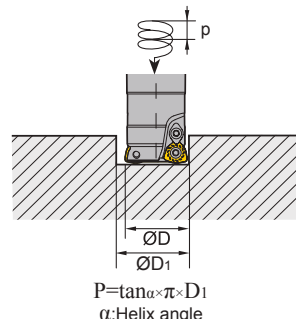
XMR01 series tools (with SD□□ inserts) have perfect edge strength and good economical efficiency, advantageous in face milling.

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

Indexable
milling tools

High feed milling cutters

Ramp milling, helical interpolation milling

	Insert	Diameter ØD(mm)	Ramp milling		Helical interpolationmilling	
			Max.cutting depth a _p (mm)	Max.plunge angle α°	Min.diameter ØD ₁ (mm)	Max.diameter (mm)
● Ramp milling  $L_m = \frac{a_p}{\tan \alpha}$ α: Plunge angle	WP**05**	20	1.5	12	24	37
	WP**06*	25	1.5	8.8	31	47
		32	1.5	5	45	61
		40	1.5	3.2	61	77
		50	1.5	2.8	81	97
WP**08*	40	1.5	9	52	77	
	50	1.5	5.4	71	97	
	63	1.5	4.3	97	123	
	80	1.5	2.9	131	157	
	100	1.5	2.1	171	197	
	125	1.5	1.3	221	247	
	160	1.5	1.1	291	317	
WP**09*	50	3.0	7.2	70	96	
	63	3.0	4.5	96	122	
	80	3.0	2.8	130	156	
	100	3.0	2.2	170	196	
	125	3.0	1.6	220	246	
	160	3.0	1.2	290	316	
● Helical interpolation milling  $P = \tan \alpha \times \pi \times D_1$ α: Helix angle						

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

Indexable
milling tools

High feed milling cutters

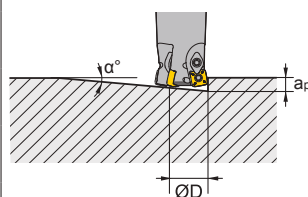


MILLING

Indexable Milling Tools

Ramp milling, helical interpolation milling

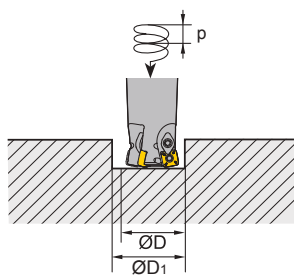
● Ramp milling



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

α : Plunge angle

● Helical interpolation milling



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

α : Helix angle

Insert	Diameter ØD(mm)	Ramp milling		Helical interpolationmilling	
		max.cutting depth a_p (mm)	max.cutting depth α°	min.diameter ØD ₁ (mm)	max. diameter(mm)
SD**06**	20	0.8	3.6	30	38
	25	0.8	2.8	40	48
	32	0.8	1.6	52	60
	40	0.8	1.1	70	78
	50	0.8	0.8	90	98
	63	0.8	0.7	114	122
SD**09**	25	1.4	6.5	34	48
	32	1.4	4.5	48	62
	35	1.4	3.6	54	68
	50	1.4	1.8	84	98
	63	1.4	1.3	110	124
SD**12**	32	1.8	10.4	44	60
	40	1.8	5.7	60	76
	50	1.8	3.5	80	96
	63	1.8	2.5	106	122
	80	1.8	1.6	140	156
	100	1.8	1.2	180	196
SD**15**	40	2.2	7.3	54	76
	80	2.2	1.4	134	156
	100	2.2	1.0	174	196
	125	2.2	0.9	234	246
	160	2.2	0.6	304	316

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

Indexable
milling tools

High feed milling cutters

➤ Recommended cutting parameters

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

Indexable
milling tools

High feed milling cutters

➤ Recommended cutting parameters

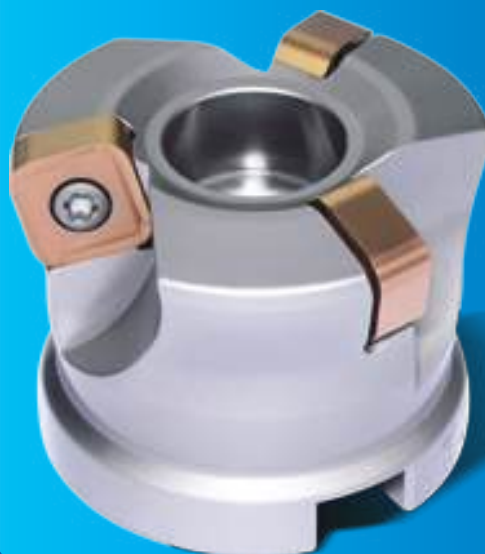
Workpiece material	Hardness HB	Insert grade	Cutting speed (m/min)	Ø40		Ø50/63		Ø80/100	
				Axial cutting depth	Feed rate per tooth	Axial cutting depth	Feed rate per tooth	Axial cutting depth	Feed rate per tooth
P	Soft steel Carbon Steel	≤HB180 HB180-280	YBC302 YBM351 YBM253 YBG205 YB9320	170(120-220) 150(100-200)	0.6~1.5	0.8~1.5	0.6~1.5	0.8~1.5	0.6~1.5 0.5~1.5
	Alloy steel Alloy tool steel	HB280-350	YBC302 YBM351 YBM253 YBG205 YB9320	130(80-180)	0.4~1.2	0.6~1.5	0.4~1.3	0.6~1.5	0.4~1.3 0.5~1.5
	pre-hardened steel	≤HRC35	YBC302 YBM351 YBM253 YBG205 YB9320	120(80-160)	0.4~1.0	0.5~1.0	0.4~1.3	0.5~1.0	0.4~1.3 0.5~1.0
M	Stainless steel	≤HB270	YBM351 YBM253	120(80-160)	0.8~1.2	0.8~1.2	1.1~1.5	0.9~1.3	1.0~1.5 0.8~1.3
			YBG205 YB9320	120(80-190)					
K	Common cast iron	Tensile strength ≤350MPa	YBG302	150(100-200)	0.6~1.5	0.8~1.6	0.6~1.5	0.8~1.7	0.6~1.5 0.6~1.7
	Nodular cast iron	Tensile strength ≤800MPa	YBG302	120(80-160)	0.4~1.2	0.6~1.4	0.6~1.3	0.6~1.5	0.4~1.3 0.5~1.5
S	Difficult-to-machine materials	≤400	YBS203	80(60-120)	0.8~1.2	0.6~1.0	1.1~1.5	0.6~1.2	1.0~1.5 0.4~1.2
			YBS303	60(45-110)	0.4~1.0	0.4~1.0	0.6~1.2	0.6~1.0	0.4~1.0 0.4~0.8



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

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

Screw clamping achieves high positioning accuracy and good economy. ▶



XMRO03 Series of High Feed Milling Cutter

8 cutting edges on both sides achieve economical and cost-effective machining.

Large rake angle design, low cutting resistance, special edge shape and tool combination achieve a large chip space, leading to excellent chip removal performance.

Due to the good versatility, it can be used for large-feed processing of various steels, as well as processing viscous materials such as stainless steel and titanium alloy.



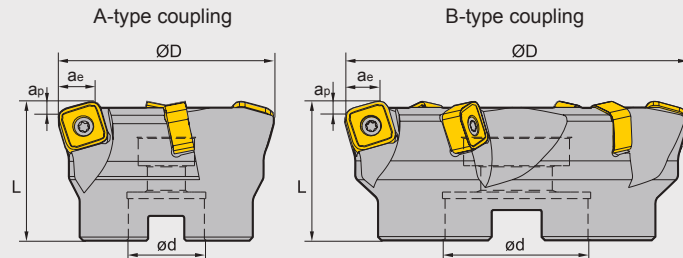
④×2=8 cutting edges



High feed milling cutters



XMR03 P M



Specification of tools

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

▲Stock available

△Make-to-order

Indexable
milling tools

High feed milling cutters

Spare parts

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

Tools code key
B24-B25Grade selection guide
B19-B23Technical data
B234-B240

B MILLING Indexable Milling Tools

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

Insert shape	Type	Basic dimensions(mm)						CVD Coating						PVD Coating						Cermet	Cemented carbide							
		L	ØI.C	r	S	ød	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SNGU120620-GM	12.7	12.7	2.0	5.6	4.4			●							●	●											

★Recommended grade (always stock available)

● Available grade (always stock available)

○ Make-to-order

Recommended cutting parameters

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

XMR03series milling cutter processing case

Workpiece: 718H(HRC 34)

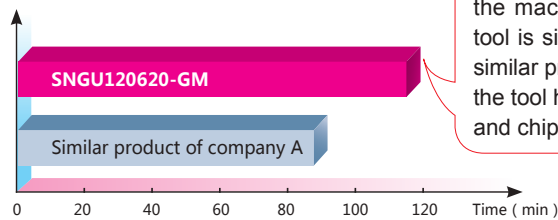
Toolholder: XMR03-050-A22-SN12-03

Insert: SNGU120620-GM/YB9320

Cutting parameter:

$V_c=142\text{m/min}$, $f_z=1.25\text{mm/z}$,

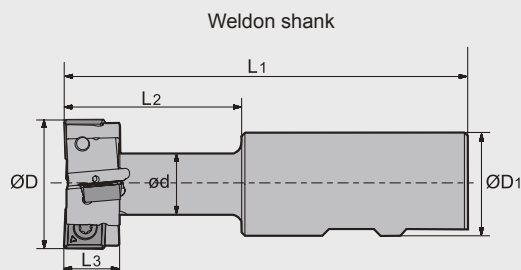
$a_p=0.8\text{mm}$



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

T-slot milling tools

Kr:90°

TMP01 

Specification of tools

Type	Stock	Basic dimensions(mm)						Number of teeth Z	Number of insert	T-slot specification
		ØD	ØD ₁	Ød	L ₁	L ₂	L ₃			
TMP01 -021-XP25-MP06-01	▲	21	25	10	100	32	9	1	2	12
-025-XP25-MP06-01	▲	25	25	12	100	35	11	1	2	14
-032-XP32-MP08-02	▲	32	32	15	110	45	14	2	4	18
-040-XP32-MP12-02	▲	40	32	19	125	55	18	2	4	22
-050-XP40-MP12-02	▲	50	40	25	140	65	22	2	4	28
-060-XP50-MP12-02	▲	60	50	32	160	80	28	2	6	36

▲ Stock available

△ Make-to-order

Indexable milling tools

T-slot milling tools

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		
TMP01-050-XP40-MP12-02	I60M5×10	--	WT20IT
TMP01-060-XP50-MP12-02	I60M5×10		

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

Tools code key
B24–B25Grade selection guide
B19–B23Technical data
B234–B240

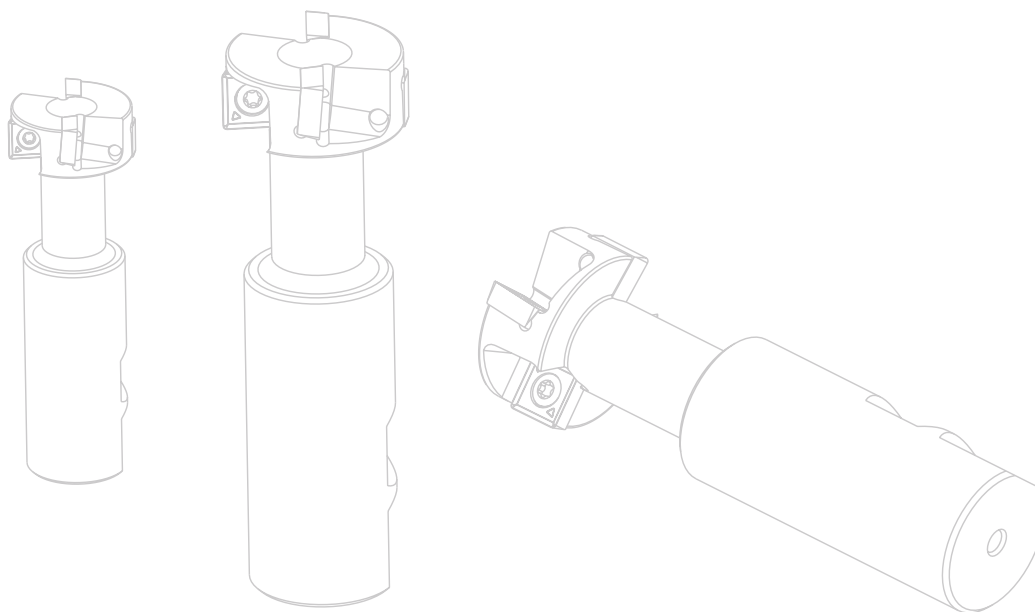
Selection of inserts

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

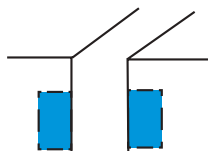
Workpiece material	Steel	Stainless steel	Cast iron	Non-ferrous metal	Heat resistant alloy, Ti alloy																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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Indexable
milling tools

T-slot milling tools



◆ Workpiece before machining



Recommended cutting parameters

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

Helical milling

Kr:90°



Side milling

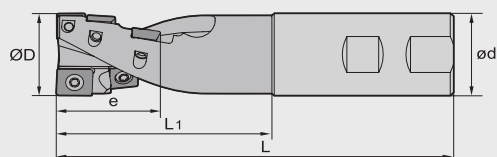


Slot milling

HMP01 P K



Weldon shank



Specification of tools

Type	Stock		Basic dimensions(mm)					Number of flute Z	Number of inserts		Shank type
	R	L	ØD	ød	e	L1	L		APKT 150412-PM/KM	SPMT 120408-PM/KM	
HMP01 -040×55-XP40-SP12-02	△	△	40	40	55	95	175	2	1	5	Weldon shank
-050×55-XP40-SP12-04	△	△	50	40	55	95	175	4	2	10	Weldon shank

▲Stock available

△Make-to-order

Spare parts

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

Tools code key
B24–B25Grade selection guide
B19–B23Technical data
B234–B240

Indexable milling tools

Helical milling



Helical milling

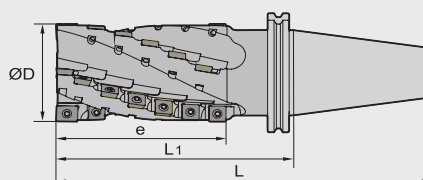
Kr:90°



HMP01 P K



JT shank/ BT shank (JT shank shown)



Specification of tools

Type	Stock		Basic dimensions(mm)				Teeth row	Number of inserts		Shank type
	R	L	ØD	e	L ₁	L		APKT 150412-PM/KM	SPMT 120408-PM/KM	
HMP01 -050×84-JT50-SP12-04	△	△	50	84	145	246.75	4	2	16	JT
-063×74-JT50-SP12-04	△	△	63	74	135	236.75	4	2	14	JT
-063×104-JT50-SP12-04	△	△	63	104	165	266.75	4	2	20	JT
-063×134-JT50-SP12-04	△	△	63	134	195	296.75	4	2	26	JT
-080×104-JT50-SP12-04	△	△	80	104	165	266.75	4	2	20	JT
-080×144-JT50-SP12-04	△	△	80	144	205	306.75	4	2	28	JT
-050×84-BT50-SP12-04	△	△	50	84	145	246.8	4	2	16	BT
-063×74-BT50-SP12-04	△	△	63	74	135	236.8	4	2	14	BT
-063×104-BT50-SP12-04	△	△	63	104	165	266.8	4	2	20	BT
-063×134-BT50-SP12-04	△	△	63	134	195	296.8	4	2	26	BT
-080×104-BT50-SP12-04	△	△	80	104	165	266.8	4	2	20	BT
-080×144-BT50-SP12-04	△	△	80	144	205	306.8	4	2	28	BT

▲ Stock available

△ Make-to-order

Spare parts

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

Tools code key

B24-B25

Grade selection guide

B19-B23

Technical data

B234-B240

Helical milling

Kr:90°



Side milling

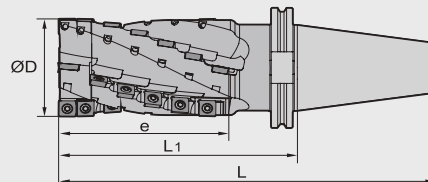


Slot milling

HMP01 EC P K



JT shank/ BT shank (JT shank shown)



Specification of tools

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

▲Stock available

△Make-to-order

Indexable
milling tools

Helical milling

Spare parts

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

Tools code key
B24-B25Grade selection guide
B19-B23Technical data
B234-B240

B MILLING Indexable Milling Tools

Selection of inserts

😊 Good working condition
😐 Normal working condition
😞 Bad working condition

Workpiece material	Basic dimensions(mm)						CVD Coating		PVD Coating		Cermet	Cemented carbide															
	L	I.W	S	ød	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
P Steel	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊
M Stainless steel	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊
K Cast iron	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊
N Non-ferrous metal	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊
S Heat resistant alloy, Ti alloy	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊
APKT150412-PM	16.33	12.7	4.76	5.4	1.2	★											●										
APKT150412-KM	16.33	12.7	4.76	5.4	1.2												●	○									

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

Selection of inserts

😊 Good working condition
😐 Normal working condition
😞 Bad working condition

Workpiece material	Basic dimensions(mm)						CVD Coating		PVD Coating		Cermet	Cemented carbide															
	L	ØI.C	S	ød	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
P Steel	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊
M Stainless steel	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊
K Cast iron	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊
N Non-ferrous metal	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊
S Heat resistant alloy, Ti alloy	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊

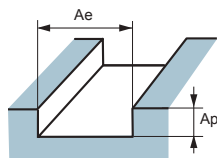
Insert shape	Type	Basic dimensions(mm)					CVD Coating		PVD Coating		Cermet	Cemented carbide																
		L	ØI.C	S	ød	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SPMT120408-PM	12.7	12.7	4.76	5.5	0.8												★										
	SPMT120408-KM	12.7	12.7	4.76	5.5	0.8												●	○									

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

Chipbreaker selection for HMP01 milling inserts

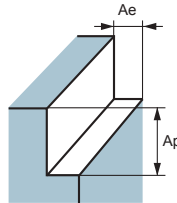
Classification	Function	For semi-finishing	For roughing
P		-PM	-PM
K		-KM	-KM

A Slot milling



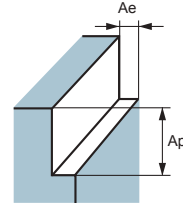
$A_e = D$
 $A_p = 0.5D$ (cast iron)
 Maximum 12mm (steel)

B Square shoulder milling



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

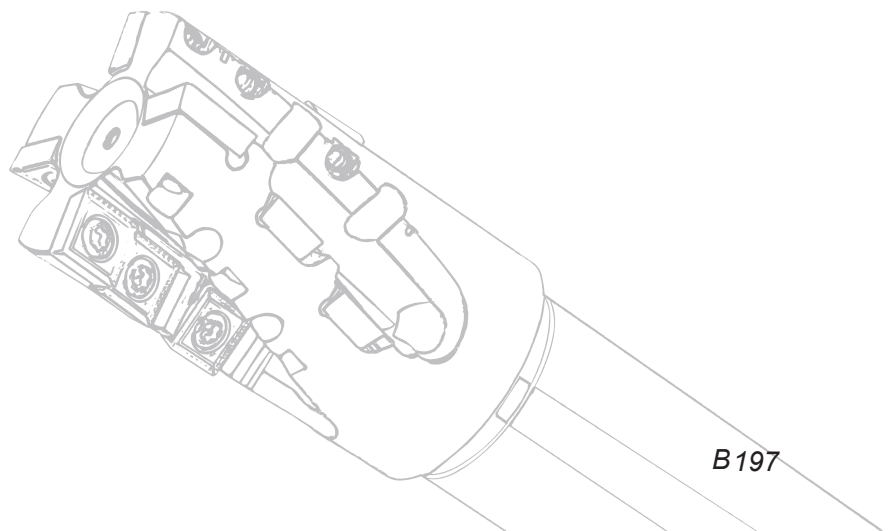
C Narrow shoulder milling



$A_e = 0.1D$
 $A_p \leq \text{Maximum cutting length}$

► Recommended cutting parameters

	Workpiece material	Hardness HB	Insert grade	Cutting parameters		Operation (figure)
				Cutting speed (m/min)	Feed speed (mm/z)	
P	Low-carbon steel, Soft steel	≤ 180	YBM253 YBG302	80(60-90)	0.25(0.1-0.35)	A
				90(70-120)	0.3(0.15-0.4)	B
				90(70-120)	0.3(0.15-0.4)	C
	High-carbon steel, Alloy steel	180-280	YBM253 YBG302	70(60-100)	0.2(0.1-0.35)	A
				80(60-120)	0.25(0.15-0.35)	B
				90(70-120)	0.25(0.15-0.35)	C
	Alloy tool steel	280-350	YBM253 YBG302	50(40-80)	0.15(0.08-0.25)	A
				60(50-100)	0.2(0.1-0.35)	B
				70(50-100)	0.2(0.1-0.35)	C
K	Cast iron	180-250	YBG152 YBG302	70(50-100)	0.2(0.1-0.35)	A
				80(60-120)	0.25(0.15-0.35)	B
				90(80-120)	0.25(0.15-0.35)	C

Indexable
milling toolsHelical endmills with
interchangeable heads



Chamfer milling

Kr:30°



Chamfering



Face milling

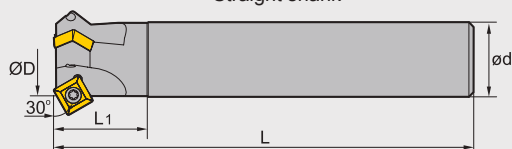


Hole stomata chamfer

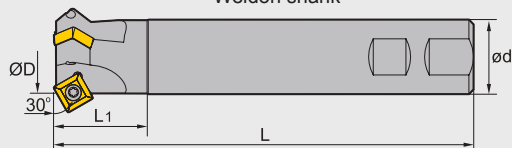
CMZ01 P M K



Straight shank



Weldon shank



Specification of tools

Type	Stock	Basic dimensions(mm)				Number of teeth Z	Weight (kg)	
		ØD	ød	L	L ₁			
CMZ01 Straight shank	-012-G20-SP12-01	△	12	20	100	40	1	0.2
	-025-G25-SP12-02	△	25	25	120	40	2	0.8
	-032-G32-SP12-03	△	32	32	180	40	3	1.1
Weldon shank	-012-XP20-SP12-01	△	12	20	100	40	1	0.2
	-025-XP25-SP12-02	△	25	25	120	40	2	0.6
	-032-XP32-SP12-03	△	32	32	180	40	3	1.0

▲ Stock available

△ Make-to-order

Spare parts

Diameter ØD	Screw	Wrench	
Ø12-Ø32	I43M5×11	WT20IS	

Tools code key
B24-B25

Grade selection guide
B19-B23

Technical data
B234-B240

Chamfer milling

Kr:45°



Chamfering



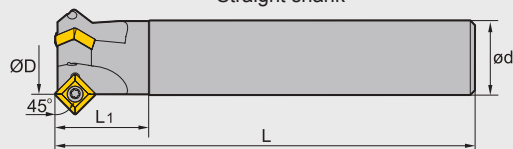
Face milling



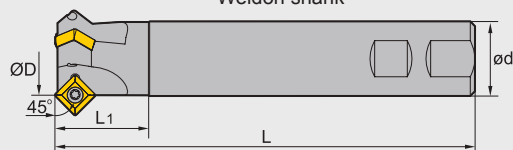
Hole stomata chamfer

CMA01 P M K

Straight shank



Weldon shank



Specification of tools

Type	Stock	Basic dimensions(mm)				Number of teeth Z	Weight (kg)
		ØD	ød	L	L ₁		
CMA01 Straight shank	▲	12	20	100	40	1	0.2
	▲	25	25	120	40	2	0.8
	▲	32	32	180	40	3	1.1
Weldon shank	▲	12	20	100	40	1	0.2
	▲	25	25	120	40	2	0.6
	▲	32	32	180	40	3	1.0

▲Stock available

△Make-to-order

Indexable
milling tools

Chamfer milling

Spare parts

Diameter ØD	Screw	Wrench	
Ø12-Ø32	I43M5×11	WT20IS	

Tools code key
B24-B25Grade selection guide
B19-B23Technical data
B234-B240



MILLING

Indexable Milling Tools

Chamfer milling tools

Kr:60°



Chamfering



Face milling

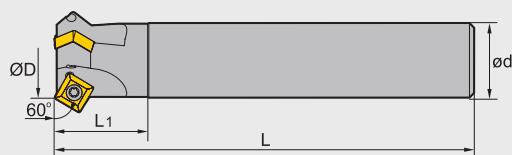


Hole stomata chamfer

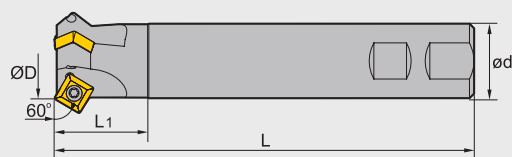
CMD01 **P** **M** **K**



Straight shank



Weldon shank



Specification of tools

Type	Stock	Basic dimensions(mm)				Number of teeth Z	Weight (kg)	
		ØD	ød	L	L ₁			
CMD01 Straight shank	-012-G20-SP12-01	▲	12	20	100	40	1	0.2
	-025-G25-SP12-02	▲	25	25	120	40	2	0.8
	-036-G32-SP12-03	▲	36	32	180	40	3	1.0
Straight shank	-012-XP20-SP12-01	▲	12	20	100	40	1	0.2
	-025-XP25-SP12-02	▲	25	25	120	40	2	0.6
	-036-XP32-SP12-03	▲	36	32	180	40	3	1.0

▲ Stock available

△ Make-to-order

Spare parts

Diameter ØD	Screw	Wrench
		
Ø12-Ø36	I43M5×11	WT20IS



Tools code key

B24-B25

Grade selection guide

B19-B23

Technical data

B234-B240

Selection of inserts

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																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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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	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	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	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	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	YBG302	130(100-180)	0.4 (0.1-0.5)

PCD&PCBN inserts

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

Inserts for face milling

SEET-CF	SEET-CM	SEET-CR	SEET-DF	SEET-DM	SEET-DR	SEET-EF	SEET-EM
Page B219	B219	B219	B219	B219	B219	B219	B219

SEET-LH	SEET-W	SEHT-AL	SEK(E)N	SEKR	SEMR-M	SEKR-M	SNG(M)X-GL
Page B219	B219	B224	B220	B220	B220	B220	B222

SNG(M)X-GM	SNG(M)X-GH	SNCU-W4	ODHT-GM	ODHT-GH	ODHT-GL	ODMT-GM	ODHT-LH
Page B222	B222	B223	B211	B211	B211	B211	B211

OFKT-DF	OFKT-DM	OFKT-LH	ONHU-PF	ONHU-PM	ONHU-W	ONHU-GM	ONHU-GH
Page B211	B211	B211	B212	B212	B212	B212	B212

ONHU-GL	ONHU-W	ONMU-GM	ONMU-GH	SNEG-GM	SNEG-HGR	SNEG-W	HNEX-DF
Page B212	B212	B212	B212	B221	B221	B221	B208

HNEX-DM	HNEX-DR	PNEG-GL	PNEG-GM	PNEG-GH	PNEG-CF/CM/CR	PNEG-PF/PM/PR	PNEG-KL/KM/KH
Page B208	B208	B213	B213	B213	B213	B214	B214

LNKT-ZR	LNKT-ZR	LNKT-ZR	SPKW	SPKT	SP□N	SPKR-GM	SPEX
Page B209	B209	B209	B226	B224	B225	B226	B227

SPMR	SP□N	TPKN	TPGN	TPUN	TPMR
Page B227	B228	B229	B229	B230	B230

Indexable milling tools

Milling inserts

Inserts for face milling

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

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

Inserts for square shoulder milling

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

	
LNKT-GL	LNMT-GM
Page B210	B210

Indexable
milling tools

Milling inserts

Inserts for profile milling

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

Inserts for side and face milling

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

Inserts for high feed

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

Inserts for T-slot milling


MPHT
Page B210

Inserts for helical milling

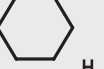
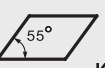
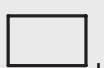
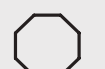
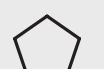
	
APKT-PM/KM	SPMT-PM/KM
Page B207	B224

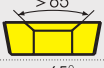
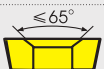
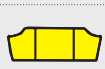
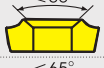
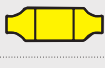
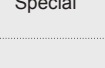
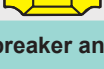
Inserts for chamfer milling


SPMT
Page B224

B MILLING Indexable Milling Tools

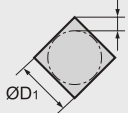
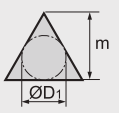
Indexable milling inserts code key

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							
  				(Reference) details of M-class tolerance (identified by shape and size)			
Code	Nose height M Tolerance(mm)	Inscribed circle ØD1 Tolerance(mm)	Thickness S Tolerance(mm)	● Nose height tolerance(mm)			
A	±0.005	±0.025	±0.025	Inscribed circle	Regular triangle	Square	Diamond with 80°
F	±0.005	±0.013	±0.025	6.35	±0.08	±0.08	±0.08
C	±0.013	±0.025	±0.025	9.525	±0.08	±0.08	±0.08
H	±0.013	±0.013	±0.025	12.7	±0.13	±0.13	±0.13
E	±0.025	±0.025	±0.025	15.875	±0.15	±0.15	±0.15
G	±0.025	±0.025	±0.13	19.05	±0.15	±0.15	±0.15
J	±0.005	±0.05-±0.13	±0.025	25.4	---	±0.18	---
K	±0.013	±0.05-±0.13	±0.025	● Tolerance of Inscribed Circle ØD1(mm)			
L	±0.025	±0.05-±0.13	±0.025	Inscribed circle	Regular triangle	Square	Diamond with 80°
M	±0.08-±0.18	±0.05-±0.13	±0.13	6.35	±0.05	±0.05	±0.05
N	±0.08-±0.18	±0.05-±0.13	±0.025	9.525	±0.05	±0.05	±0.05
U	±0.13-±0.38	±0.08-±0.25	±0.13	12.7	±0.08	±0.08	±0.08
				15.875	±0.10	±0.10	±0.10
				19.05	±0.10	±0.10	±0.10
				25.4	---	±0.13	---

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

Length of cutting edge

Thickness is defined as the height from the bottom of insert to the highest part of cutting edge	
Code	Insert thickness(mm)
00	0.79
T0	0.99
01	1.59
T1	1.98
02	2.38
T2	2.58
03	3.18
T3	3.97
04	4.76
T4	4.96
05	5.96
T5	5.95
06	6.35
T6	6.75
07	7.94
09	9.52
T9	9.72
11	11.11
12	12.70

Insert thickness

12 04 ED T21 R-DM

Wiper			
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)			
	0-5°	0-0.10	
	1-10°	1-0.15	
	2-15°	2-0.20	
	3-20°	3-0.25	
	4-25°	4-0.30	
	5-30°	5-0.35	
	6-0.40		
	7-0.45		No mark

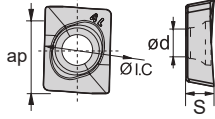
Chipbreaker code

Cutting direction

R	Right hand
L	Left hand
N	Neutral

B MILLING Indexable Milling Tools

AP



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

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

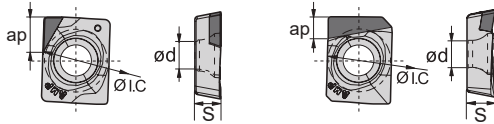
Insert shape	Type	Basic dimensions(mm)				PCD	PCBN	Cemented carbide
		ØI.C	S	ød	apmax	DN1021	BK1021	YD201
	APHT12T304PPFR-AL	12.7	3.97	4.4	12			★

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

Indexable milling tools

Milling inserts

AP



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

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

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

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

[illegible]

Milling inserts

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

Workpiece material	Steel				Stainless steel				Cast iron				Non-ferrous metal				Heat resistant alloy, Ti alloy			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
P Steel	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊
M Stainless steel	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊
K Cast iron																				
N Non-ferrous metal																				
S Heat resistant alloy, Ti alloy																				

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

Indexable Milling Tools

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

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

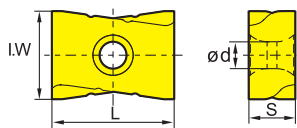
Milling inserts

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

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

[illegible]

Milling inserts

LN [illegible]

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

Indexable Milling Tools

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

[illegible]

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

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

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

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

[illegible][illegible]

Indexable milling tools

Milling inserts

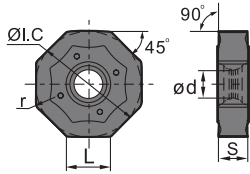
	Steel	Stainless steel	Cast iron	Non-ferrous metal	Heat resistant alloy, Ti alloy
Workpiece material					

[illegible]

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

B MILLING Indexable Milling Tools

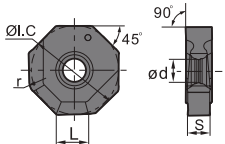
ON  

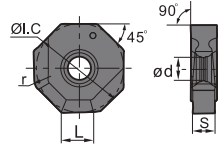


😊 Good working condition 😐 Normal working condition ☹ Bad working condition

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

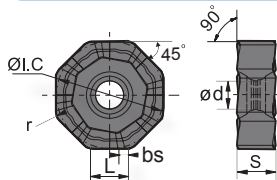
Insert shape	Type	Basic dimensions(mm)					CVD Coating						PVD Coating						Cermet	Cemented carbide								
		L	ØI.C	S	ød	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG320	YBG302		YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101
	ONHU060408-PF	6.58	15.875	4.76	4.4	0.83	★		●		★			★	★													
	ONHU08T508-PF	8.37	20.2	5.77	5.3	0.83	★		●		★			★	★	●												
	ONHU060408-PM	6.58	15.875	4.76	4.4	0.83	★		★		★		●		●													
	ONHU08T508-PM	8.37	20.2	5.79	5.3	0.83	★		★		★																	
	ONHU08T508-W	6.9	20.5	6.00	5.3	0.80	★				★		★															





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

ON  



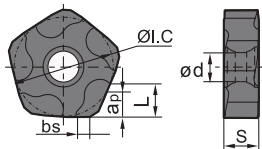
😊 Good working condition 😐 Normal working condition ☹ Bad working condition

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

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

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

PN



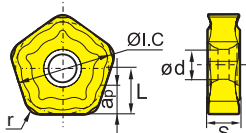
Good working condition Normal working condition Bad working condition

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

Insert shape	Type	Basic dimensions(mm)						CVD Coating						PVD Coating						Cermet		Cemented carbide								
		L	ØI.C	S	ød	bs	ap	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201	
	PNEG110512R-CF	5.4	15.875	5.56	4.64	1.6	5						●																	
	PNEG110512L-CF	5.4	15.875	5.56	4.64	1.6	5						●																	
	PNEG110512R-CM	5.4	15.875	5.56	4.64	1.6	5						●																	
	PNEG110512L-CM	5.4	15.875	5.56	4.64	1.6	5						●																	
	PNEG110512R-CR	5.4	15.875	5.56	4.64	1.6	5						●	●																
	PNEG110512L-CR	5.4	15.875	5.56	4.64	1.6	5						●	●																

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

PN



Good working condition Normal working condition Bad working condition

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

Insert shape	Type	Basic dimensions(mm)						CVD Coating						PVD Coating						Cermet	Cemented carbide									
		L	ØI.C	S	ød	r	apmax	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201	
	PNEG110512-GL	7.5	15.875	5.56	4.64	1.2	5.5				●						●	★												
	PNEG110530-GM	7.5	15.875	5.56	4.64	3.0	5.5				●						●	★												
	PNEG110530-GH	7.5	15.875	5.56	4.64	3.0	5.5				●						●	★												

● Inserts are suitable for both left and right cuts.

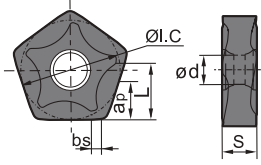
★ Recommended grade (always stock available) ● Available grade (always stock available) ○ Make-to-order

Indexable milling tools

Milling inserts

B MILLING Indexable Milling Tools

PN



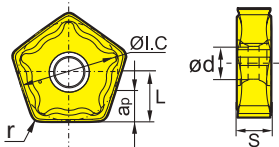
😊 Good working condition 😐 Normal working condition ☹️ Bad working condition

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

Insert shape	Type	Basic dimensions(mm)						CVD Coating				PVD Coating				Cermet	Cemented carbide											
		L	ØI.C	S	ød	bs	apmax	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101
	PNEG110512R-PF	7.5	15.875	5.56	4.64	1.4	7.5	★	●																			
	PNEG110512L-PF	7.5	15.875	5.56	4.64	1.4	7.5	★	●																			
	PNEG110512R-PM	7.5	15.875	5.56	4.64	1.4	7.5	★	●																			
	PNEG110512L-PM	7.5	15.875	5.56	4.64	1.4	7.5	★	●																			
	PNEG110512R-PR	7.5	15.875	5.56	4.64	1.4	7.5	★	●																			
	PNEG110512L-PR	7.5	15.875	5.56	4.64	1.4	7.5	★	●																			

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

PN



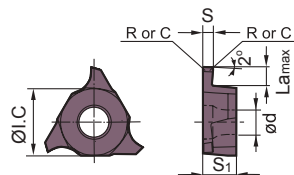
😊 Good working condition 😐 Normal working condition ☹️ Bad working condition

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

Insert shape	Type	Basic dimensions(mm)						CVD Coating						PVD Coating						Cermet	Cemented carbide								
		L	ØI.C	S	ød	r	apmax	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	PNEG110512-KL	6.5	15.875	5.56	4.64	1.2	6.5						●	●															
	PNEG110512-KM	6.5	15.875	5.56	4.64	1.2	6.5						●	●															
	PNEG110512-KH	6.5	15.875	5.56	4.64	1.2	6.5						●	●															

● Inserts are suitable for both left and right cuts.

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



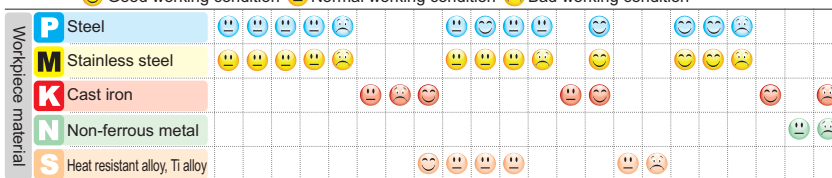
😊 Good working condition 😐 Normal working condition 😞 Bad working condition

Workpiece material	Good working condition					Normal working condition					Bad working condition				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
P Steel	😊	😊	😊	😊	😊						😊	😊	😊	😊	😊
M Stainless steel	😊	😊	😊	😊	😊						😊	😊	😊	😊	😊
K Cast iron						😞	😞	😞				😞	😞		😞
N Non-ferrous metal															😊
S Heat resistant alloy, Ti alloy						😞	😞	😞	😞			😞	😞		

[illegible]

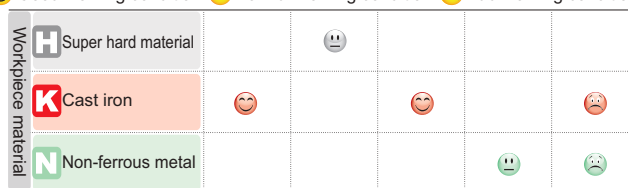
★ Recommended grade (always stock available) ● Available grade (always stock available) ○ Make-to-order

😊 Good working condition 😐 Normal working condition 😞 Bad working condition



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

😊 Good working condition 😐 Normal working condition 😞 Bad working condition



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

Workpiece material	CNC turning				Machining				Milling				Grinding			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
P Steel	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊
M Stainless steel	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊
K Cast iron					😞	😞	😞						😞	😞		😞
N Non-ferrous metal																😊
S Heat resistant alloy, Ti alloy					😊	😊	😊	😊					😊	😊		

[illegible]

Milling inserts

Technical drawing of a yellow circular component. The front view shows a circle with a central hole of diameter $\varnothing 1, C$. A diagonal line across the circle is labeled L . The side view shows a rectangular cross-section with a width of $\varnothing d$ and a height of S .

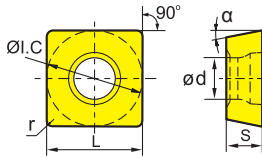
[illegible]

Insert shape	Type	Basic dimensions(mm)				CVD Coating						PVD Coating						Cermet		Cemented carbide							
		ØI.C	L	S	ød	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YN201
	ROHX1203	12	8.5	3	4														○								
	ROHX1604	16	11.3	4	5														○								
	ROHX2005	20	14.1	5	5														○								

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

B MILLING Indexable Milling Tools

SD



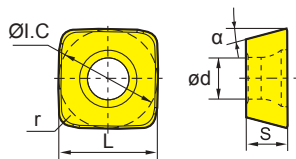
😊 Good working condition 😊 Normal working condition 😊 Bad working condition

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

Insert shape	Type	Basic dimensions(mm)						CVD Coating						PVD Coating						Cermet	Cemented carbide								
		r	L	ØI.C	S	øD	α	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SDMT090308	0.8	9.525	9.525	3.18	4.4	15°			○									○										

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

SD



😊 Good working condition 😊 Normal working condition 😊 Bad working condition

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

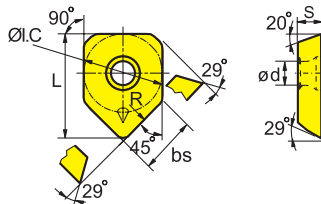
Insert shape	Type	Basic dimensions(mm)						CVD Coating						PVD Coating						Cermet	Cemented carbide								
		ØI.C	L	r	S	ød	α	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SDMT06T208-DM	6.35	6.35	0.8	2.58	2.5	15°	★			★							●	○				●						
	SDMT09T312-DM	9.525	9.525	1.2	3.97	4.0	15°	★			★							●	○										
	SDMT120412-DM	12.7	12.7	2.0	4.76	4.4	15°	★			★						★	●	○										
	SDMT150520-DM	15.875	15.875	2.0	5.56	5.5	15°	★			★							●	●	○									
	SDMT06T208-PM	6.35	6.35	0.8	2.58	2.5	15°	★		○							●					●	●						
	SDMT09T312-PM	9.525	9.525	1.2	3.97	4.0	15°	★		●							●												
	SDMT120412-PM	12.7	12.7	2.0	4.76	4.4	15°	★		●							●												
	SDMT150520-PM	15.875	15.875	2.0	5.56	5.5	15°	★		●							●												
	SDMT06T208-NM	6.35	6.35	0.8	2.58	2.5	15°				●												●						
	SDMT09T312-NM	9.525	9.525	1.2	3.97	4.0	15°				○											○	○						
	SDMT120412-NM	12.7	12.7	1.2	4.76	4.4	15°				○							○				○	○						
	SDMT150520-NM	15.875	15.875	2.0	5.56	5.5	15°				●							●					●						

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

Technical drawing of a square bar with a circular hole. The front view shows a square with side length L and a central circular hole with diameter $\varnothing C$. The top view shows the square with a corner chamfer of size S at a 29° angle, and a fillet radius bs at the corners. The side view shows the square with a height of 20° and a diameter $\varnothing d$.

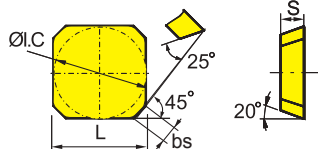
[illegible]

Insert shape	Type	Basic dimensions(mm)						CVD Coating						PVD Coating						Cermet		Cemented carbide						
		L	ØI.C	S	ød	bs	R	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151C	YNG151C	YC30S	YD051	YD101	YD201
	SEET12T3-DF	13.4	13.4	3.97	4.1	2.55	--	●	★	●						★	○											
	SEET12T3-CF	13.4	13.4	3.97	4.1	2.55	--						○	★		★	○											
	SEET12T3-EF	13.4	13.4	3.97	4.1	2.55	--										★	○										
	SEET12T3-DM	13.4	13.4	3.97	4.1	2.55	--	●	★	●		○				★	★											
	SEET18T6-DM	18.0	18.0	6.1	5.5	1.5	--		○		○																	
	SEET12T3-CM	13.4	13.4	3.97	4.1	2.55	--					★				★	○											
	SEET12T3-EM	13.4	13.4	3.97	4.1	2.55	--			●		●				★	★											
	SEET18T6-EM	18.0	18.0	6.1	5.5	1.5	--				○							○										
	SEET12T3-DR	13.4	13.4	3.97	4.1	2.55	--	●	★			●				★	★											
	SEET12T3-CR	13.4	13.4	3.97	4.1	2.55	--	●				★				★	★											
	SEET12T3-LH	13.4	13.4	3.97	4.1	2.55	--																			○	★	
	SEET12T3-W	17.82	13.4	3.97	4.1	9.46	500	★	●			★			★							★						
	SEET18T6-W	24.78	18.0	6.1	5.5	11.0	500									○												



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

Indexable Milling Tools

SE 

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

Workpiece material	Good working condition					Normal working condition					Bad working condition				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
P Steel	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊
M Stainless steel	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊
K Cast iron															
N Non-ferrous metal															
S Heat resistant alloy, Ti alloy															

[illegible]

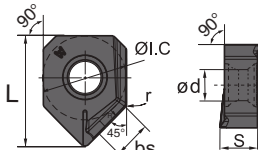
★ Recommended grade (always stock available) ● Available grade (always stock available) ○ Make-to-order

[illegible][illegible]

Milling inserts

Workpiece material	Steel working condition					Stainless steel working condition					Cast iron working condition					Non-ferrous metal working condition					Heat resistant alloy, Ti alloy working condition				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
P Steel	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊
M Stainless steel	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊
K Cast iron											😞	😞	😞			😞	😞							😞	😞
N Non-ferrous metal																					😊	😊	😊	😊	😊
S Heat resistant alloy, Ti alloy											😊	😊	😊	😊	😊						😊	😊	😊	😊	😊

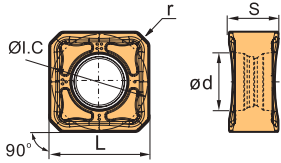
Insert shape	Type	Basic dimensions(mm)						CVD Coating						PVD Coating						Cermet	Cemented carbide								
		L	ØI.C	S	bs	ød	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SNMG1205ANR-GM	7.6	12.0	4.76	1.05	4.6	0.8	★		★		★				★	★					○	○						
	SNMG1506ANR-GM	9.4	15.0	5.54	1.30	5.5	0.9	★		★		★				★	★						○						
	SNMG1205ANR-HGR	7.6	12.0	4.76	1.05	4.6	0.8	★		★			○			★	★												
	SNMG1506ANR-HGR	9.4	15.0	5.54	1.30	5.5	0.9	★		★			○			★	★												
	SNMG1907ANR-HGR	12.1	19.0	7.0	1.67	7.2	1.0	★		★			○			★	★												
	SNMG1205ANR-W	15.9	12.0	4.76	4.07	4.6	0.6									●													
	SNMG1506ANR-W	19.9	15.0	5.54	4.97	5.5	0.9									●													



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

B MILLING Indexable Milling Tools

SN



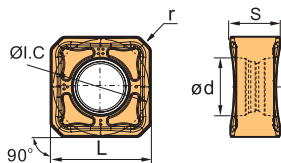
😊 Good working condition 😐 Normal working condition 😞 Bad working condition

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

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

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

SN

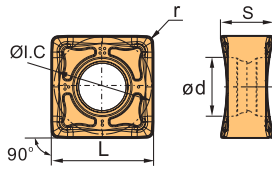


😊 Good working condition 😐 Normal working condition 😞 Bad working condition

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

Insert shape	Type	Basic dimensions(mm)						CVD Coating						PVD Coating						Cermet	Cemented carbide								
		L	ØI.C	S	ød	r	apmax	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBS320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SNGX1205ENN-GL	12.7	12.7	6.5	5.9	0.8	8.0				●	●					★												
	SNMX120512-GL	12.7	12.7	6.5	5.9	1.2	8.0				●	●					★												
	SNGX1205ENN-GM	12.7	12.7	6.5	5.9	0.8	8.0				●	●					★						●						
	SNMX120512-GM	12.7	12.7	6.5	5.9	1.2	8.0				●	●					★						●						
	SNGX1205ENN-GH	12.7	12.7	6.5	5.9	0.8	8.0				●	●					★												
	SNMX120512-GH	12.7	12.7	6.5	5.9	1.2	8.0				●	●					★												

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

SN 
 Good working condition
  Normal working condition
  Bad working condition

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

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

● Inserts are suitable for both left and right cuts.

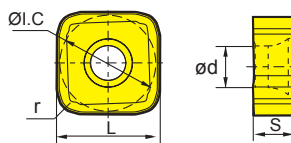
★ Recommended grade (always stock available)

● Available grade (always stock available)

○ Make-to-order

Indexable milling tools

Milling inserts

SN 
 Good working condition
  Normal working condition
  Bad working condition

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

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

★ Recommended grade (always stock available)

● Available grade (always stock available)

○ Make-to-order

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

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

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

CBN insert edge can be treated as per machining requirements

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

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

Technical drawing of a mechanical part. The main view shows a yellow rectangular block with a dashed circle of diameter $\varnothing 1.6$ and a length L . A circular inset shows a cross-section with a radius 0.8 and a width 0.8 . A side view shows a yellow rectangular block with a height S and a width 11 . The drawing includes angles of 75° , 15° , and 11° .

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

[illegible]

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

Milling inserts

Indexable Milling Tools

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

Milling inserts

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

[illegible][illegible]

Indexable milling tools

Milling inserts

[illegible]

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

B 227

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

Workpiece material	CNC turning (center)					CNC turning (turning)					CNC turning (external)					
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	
P Steel	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊
M Stainless steel	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊	😊
K Cast iron						😞	😞	😞			😞	😞				😞
N Non-ferrous metal																😞
S Heat resistant alloy, Ti alloy						😊	😊	😊	😊	😊		😞	😞			

Insert shape	Type	Basic dimensions(mm)						CVD Coating						PVD Coating						Cermet		Cemented carbide						
		L	ØI.C	S	be	bs	α	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YBG320	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	TPKN2204PDFR	22	12.7	4.76	1.4	0.7	11°							○														○
	TPKN2204PDFL	22	12.7	4.76	1.4	0.7	11°							○														○
	TPKN2204PDR	22	12.7	4.76	1.4	0.7	11°	●				●		★ ★			★								●	○	○	●
	TPKN2204PDL	22	12.7	4.76	1.4	0.7	11°																		●			
	TPKN2204PDTR	22	12.7	4.76	1.4	0.7	11°	●																	●			
	TPKN2204PDTL	22	12.7	4.76	1.4	0.7	11°	○																	○			

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

[illegible][illegible]

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

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

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

[illegible]

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

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

		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			

[illegible]

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

Indexable milling tools

Milling inserts

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

[illegible][illegible]

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

Indexable Milling Tools

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

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

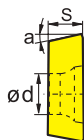
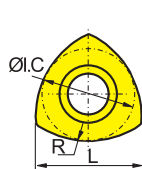
😊 Good working condition 😐 Normal working condition 😞 Bad working condition

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

😊 Good working condition 😐 Normal working condition 😞 Bad working condition

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

ZP



😊 Good working condition 😐 Normal working condition 😞 Bad working condition

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

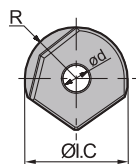
Insert shape	Type	Basic dimensions(mm)						CVD Coating						PVD Coating						Cermet	Cemented carbide								
		ØI.C	L	S	R	ød	α	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	ZPNT2204CY(R20)	12.7	16.1	4.76	20	5.56	11°			○									○										
	ZPNT2204CY(R25)	12.7	16.9	4.76	25	5.56	11°			○										○									
	ZPNT2204CY(R31)	12.7	17.6	4.76	31.5	5.56	11°			○										○									

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

Indexable milling tools

Milling inserts

ZO



😊 Good working condition 😐 Normal working condition 😞 Bad working condition

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

Insert shape	Type	Basic dimensions(mm)				CVD Coating						PVD Coating						Cermet		Cemented carbide							
		R	ØI.C	S	ød	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	ZOHX1203-GF	6	12	3	4														●								
	ZOHX1604-GF	8	16	4	5														●								
	ZOHX2005-GF	10	20	5	5														●								
	ZOHX2506-GF	12.5	25	6	6														○								
	ZOHX3007-GF	15	30	7	8														○								
	ZOHX3207-GF	16	32	7	8														○								
	ZOHX1203-GM	6	12	3	4														●								
	ZOHX1604-GM	8	16	4	5														●								
	ZOHX2005-GM	10	20	5	5														●								
	ZOHX2506-GM	12.5	25	6	6														●								
	ZOHX3007-GM	15	30	7	8														●								
	ZOHX3207-GM	16	32	7	8														★								

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



MILLING

Indexable Milling Tools

Technical information

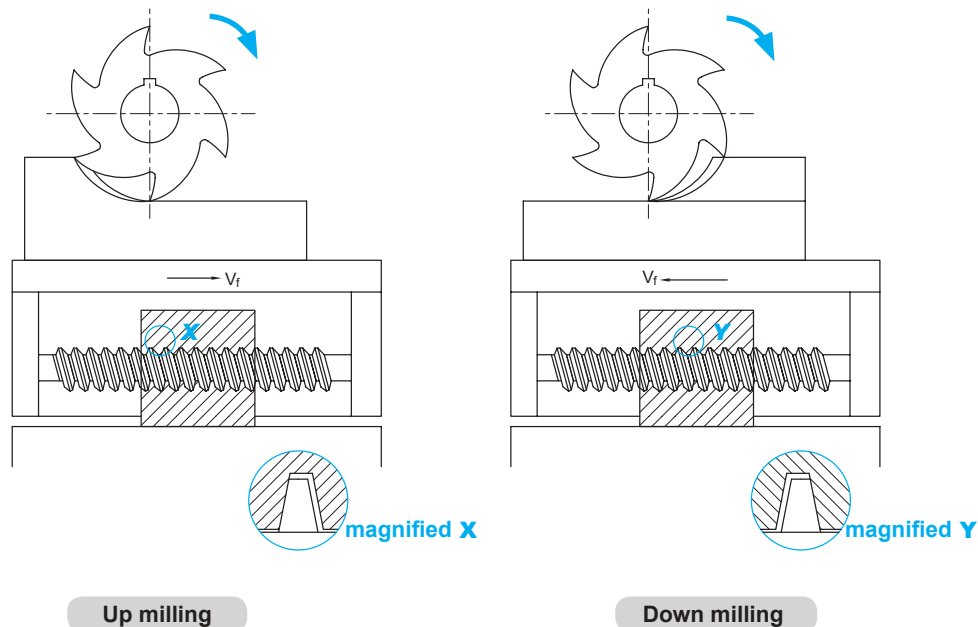
Common problems in milling and solutions

Main points of solution and inspection			Selection of tool material		Cutting condition					Tool shape								Machine clamping system		
			Material with higher hardness	Material with perfect toughness	Cutting speed	Feed rate	Cutting depth	Change the diameter and width of milling tools	Cutting liquid	Rake angle	Approach angle	Strength of cutting edge	Number of teeth	Increase the width of chip pocket	Examine the geometry shape of Minor cutting edge.	check the end face run-out	Improve the rigidity of tool	Clamping system of workpiece	Overhang of tool	Power, gap
Failure																				
Fracture of tool nose	severe abrasion on clearance face	Improper cutting condition			↓				✓											
		Unsuitable geometry shape of cutting edge	✓							↑		↓								
	severe abrasion on rake face	Improper cutting condition			↓	↓	↓		✓											
		Unsuitable geometry shape of cutting edge	✓							↑	↓	↓								
	Fracture of cutting edge	Improper cutting condition				↓	↓													
		Unsuitable geometry shape of cutting edge		✓							↓	↑			✓	✓	✓	✓	✓	
	Thermal cracking	Improper cutting condition			↓	↓	↓		✓											
		Unsuitable geometry shape of cutting edge								↑		↓								
	Build-up edge	Improper cutting condition			↑	↑			✓											
		Unsuitable geometry shape of cutting edge								↑		↓								
Machining precision	Bad surface roughness	Abrasion of tool Great vibration of milling tool	✓		↑	↓	↓		✓			↓		Wiper	✓					
		Unsuitable geometry shape of cutting edge			↓	↓	↓	✓												
	Burrs occurring	Improper geometry shape of cutting edge								↑	↑	↓			✓					
		Unsuitable geometry shape of cutting edge				↓	↓													
	Side collapse	Unsuitable geometry shape of cutting edge								↑	↓	↓	↑		✓		✓			
		Unsuitable geometry shape of cutting edge									↑	↓	↓							
Planeness and parallelism deterioration	Improper geometry Improper technique				↓	↓			↑	↑		↓		✓	✓	✓	✓	✓		
Other	Vibration	Cutting condition Improper technology			↓	↓	↓	✓		↑	↑	↓				✓	✓	✓	✓	
	Chips twisting and jamming	Improper cutting condition			↑	↑↓		✓	✓				↓							
		Unsuitable geometry shape of cutting edge									↑			↓	✓					

Indexable milling tools

Technical information

Difference and selection between down milling and up milling



Up milling

Down milling

Climb milling (also called down milling): the feed direction of workpiece is the same as that of the milling rotation at the connecting position.

Conventional milling (also called up milling): the feed direction of workpiece is opposite to that of the milling rotation at the connecting position.

In down milling, the major force of cutting edge is the compressive stress, while in up milling is the tensile stress. The compressive strength of cemented carbide material is much larger than its tensile strength. In down milling, as chips become thin from thick gradually, cutting edge and workpiece press against each other. The friction between edge and workpiece is small, thus reducing the abrasion of edge, the hardening of workpiece surface and the surface roughness (R_a). In up milling, chips become thick from thin gradually. When the insert is cutting into the workpiece, it produces strong friction and more heat than in down milling, and make workpiece surface hardened.

In up milling, because horizontal direction of cutting force milling cutter conducting on workpiece is opposite to the feed direction of workpiece, the lead screw of worktable joints closely with one side of the screw nut. In down milling, the direction of cutting force is the same as the feed direction. When edge's radial force on workpiece is large enough, the worktable will bounce left and right, thus make the gap fall behind. The gap will return to the front side with the continuing rotation of lead screw. At this moment the worktable stops motion, however, it will bounce left and right again when the radial cutting force is large enough again. The periodical bounce of worktable will cause poor surface quality of workpiece and tool breakage.

When using end mills for down milling, the edges always starts cutting at the workpiece surface, therefore end mills are not suitable for machining workpiece with hardened surface.

Up milling is recommended for milling thin-wall components or square milling with high requirement for precision.



Pitch selection

Pitch is the distance between one point on one cutting edge and the same point on the next edge. Milling cutters are mainly classified into coarse, close and extra close pitches.

optimized stability		
L (Low)	M (Medium)	H (High)
Coarse pitch Unequal pitch design 	Close pitch 	Extra close pitch 
When the milling width is equal to diameter of cutter, the machining system is stable and main power of machine is sufficient, the use of coarse pitch can achieve high productive efficiency.	Used in general milling and multiple mixed productions.	When the milling width is less than diameter of cutter, cutting by maximum edges can achieve high productive efficiency.

Selection of approach angle

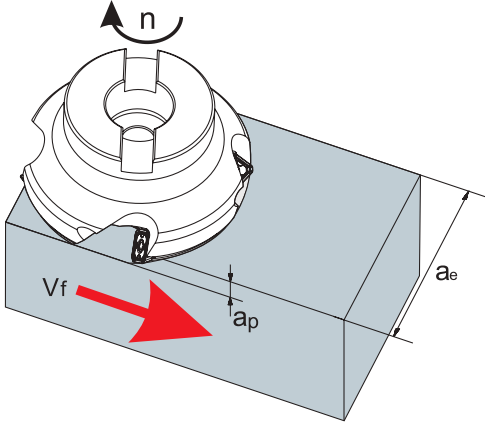
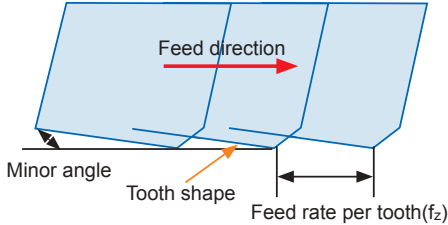
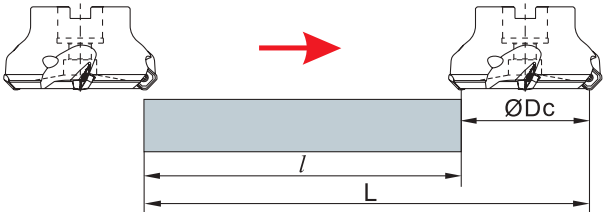
The approach angle is formed by insert and tool body. It affects chip thickness, cutting forces and tool-life. Decreasing the approach angle reduces chip thickness and expands the cutting area between cutting edge and workpiece at a given feed rate.

A smaller approach angle also ensures stable entry or exit, protecting the cutting edge and extending tool life. However, this will increase axial cutting forces on the workpiece, thus is not suitable for machining thin workpiece such as thin plate.

Approach angle	Feed rate per tooth	Real maximum cutting depth
90°	f_z	$h_{ex}=f_z \times \sin \kappa r$
75°	f_z	$h_{ex}=0.96 \times f_z$
60°	f_z	$h_{ex}=0.86 \times f_z$
45°	f_z	$h_{ex}=0.707 \times f_z$
Round insert	f_z	$h_{ex}=\frac{\sqrt{i C^2 \times (i C-2 a_p)^2}}{i C} \times f_z$

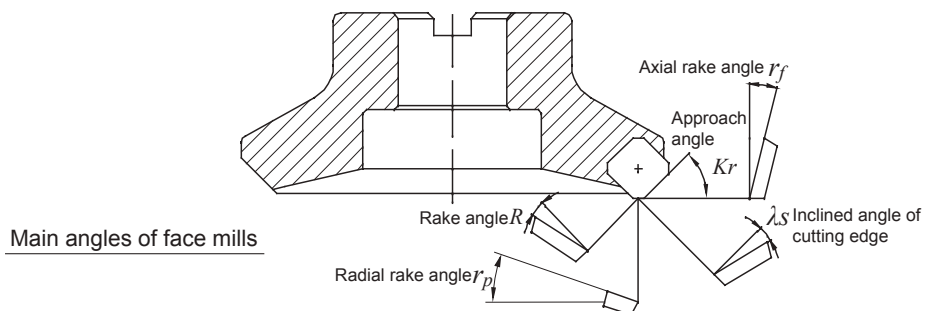


General formula

V_c : cutting speed(m/min) D_c : nominal diameter of milling tool(mm) n : spindle speed(rev/min) z_n : number of teeth Q : metal removal rate(cm^3/min) L : Actual working distance(mm)	V_f : feed rate of worktable (feed speed)(mm/min) f_z : feed rate per tooth(mm/z) π : circumference ratio ≈ 3.14 T_c : machining time(min) f_n : feed rate per revolution (mm/rev)
Cutting speed $V_c = \frac{\pi \times D_c \times n}{1000} \text{ (m/min)}$	  
Spindle speed $n = \frac{1000 \times V_c}{\pi \times D_c} \text{ (rev/min)}$	
Feed rate of worktable (feed speed) $V_f = f_z \times n \times z_n \text{ (mm/min)}$	
Feed rate per tooth $f_z = \frac{V_f}{n \times Z_n} \text{ (mm/z)}$	
Feed rate per revolution $f_n = \frac{V_f}{n} \text{ (mm/rev)}$	
Machining time $T_c = \frac{L}{V_f} \text{ (min)}$	
Metal removal rate $Q = \frac{a_p \times a_e \times V_f}{1000} \text{ (cm}^3/\text{min)}$	



Function of each part in face milling



Main angles of face mills

Main angles of face mills

Designation	Function	Effect		
Axial rake angle r_f	Determining the chip direction	Negative angle, excellent capability of chip removal		
Radial rake angle r_p	Determining whether the cutting is easy and fast or not	Positive angle: good cutting performance		
Approach angle Kr	Determining the chip thickness	$Kr \uparrow$, chip thickness $\uparrow$; $Kr \downarrow$, chip thickness $\downarrow$		
Rake angle R	Determining whether easy and fast the cutting is or not	Poor cutting performance, High-strength cutting edge	$(-)\leftarrow 0 \rightarrow (+)$	Good cutting performance, Low-strength cutting edge
Inclined angle of cutting edge λ_s	Determining the chip flow direction	Poor capability of chip removal, High-strength cutting edge	$(-)\leftarrow 0 \rightarrow (+)$	Good performance of chip removal, Low-strength cutting edge

Characteristics of different rake angles combined

		Double positive rake angle	Double negative rake angle	Positive and negative rake angle
Negative rake angle				
0° rake angle				
Positive rake angle				
Axial rake angle r_f		+	-	+
Radial rake angle r_p		+	-	-
Applicable material machined	P	✓		✓
	M	✓		✓
	K		✓	✓
	N	✓		
	S	✓		✓

Cutting performances of different approach angles

Approach angle	45°	75°	90°
Schematic diagram			
Instruction	Axial force is the largest. It will bend when machining thin-wall workpiece, reducing the precision of workpiece. It can help avoid fringe breakage of workpiece when machining cast iron.	The main force is radial cutting force. It is often used in general face milling.	The axial force is zero in theory, suitable for milling thin plate workpiece.

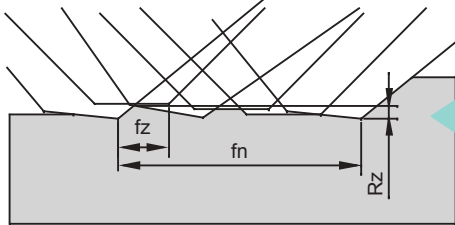


MILLING

Indexable Milling Tools

Technical information

Wiper insert

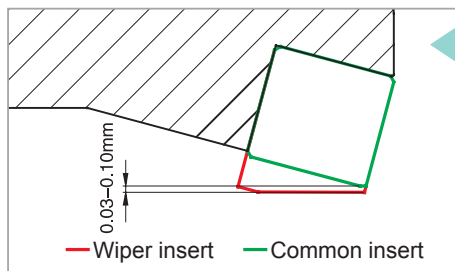


It has axial and radial run-out because tools and inserts have manufacturing tolerance. The axial run-out leads to poor surface roughness.

Solution

Mounting wiper inserts

usage

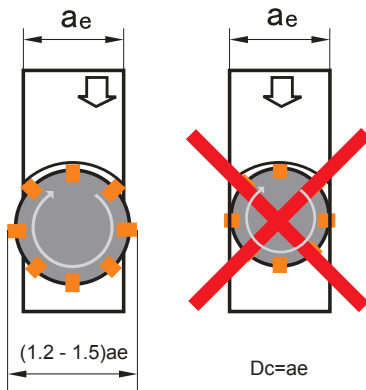


The wiper insert must protrude below the other inserts by 0.03-0.10 mm at axial direction, so that the wiping function can take effect. Generally speaking, a cutter just needs only one wiper insert. If the diameter of cutter is much larger or cutter's feed rate per revolution is higher than the length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

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Technical information

Selection of cutting width and tool cutting diameter in face milling



Dc: Tool cutting diameter
ae: Cutting width

Generally speaking, the relation between cutting width and tool cutting diameter is $Dc = (1.2 - 1.5) ae$.

In practical machining, same center line of tool center and work piece center should be avoided.